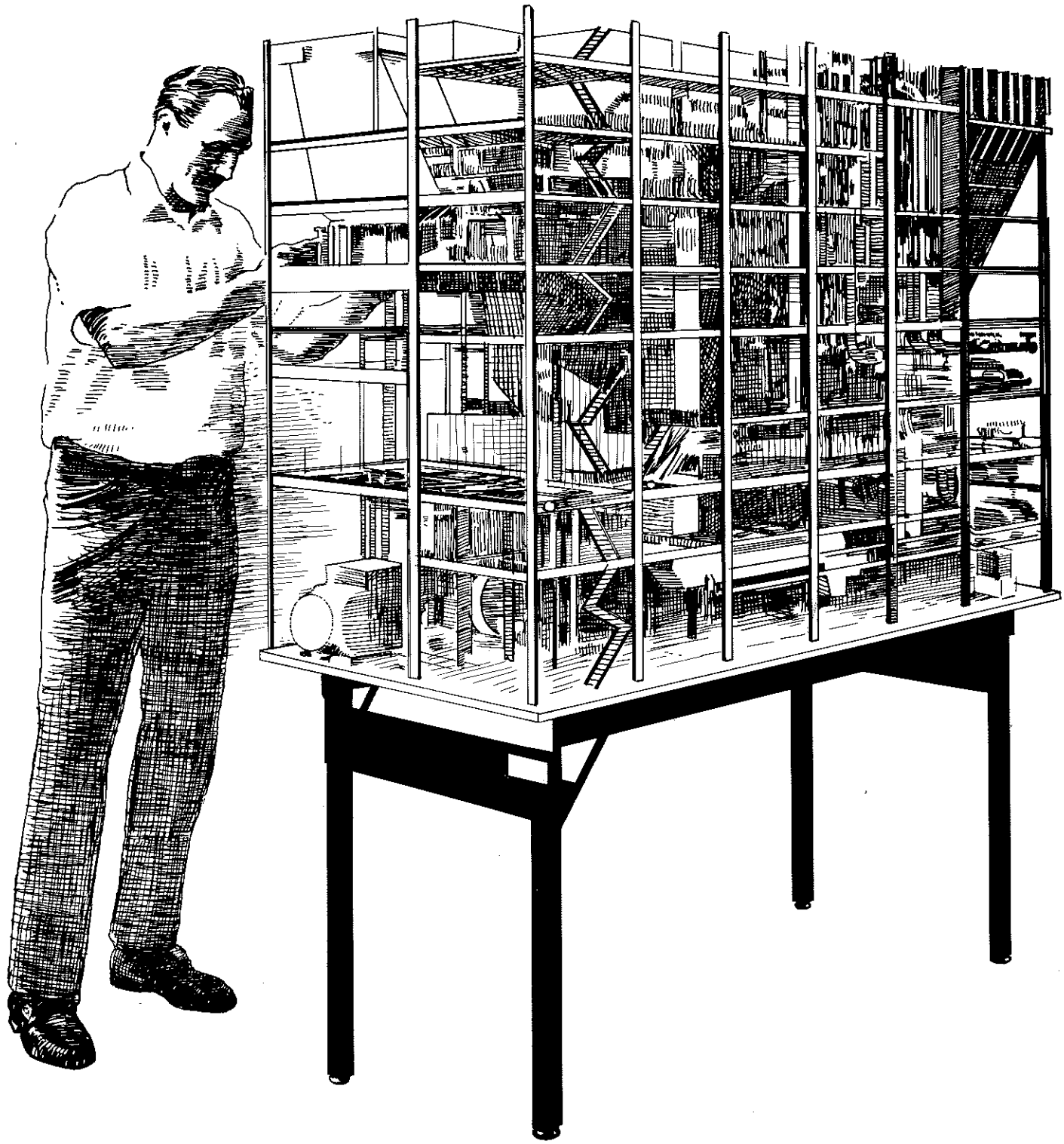

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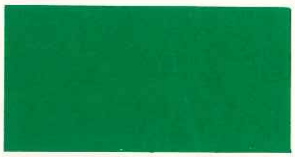
E.M.A. COLORS AND CODES

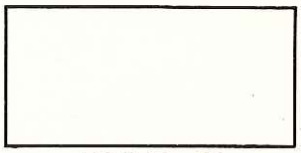
RED - R

YELLOW - Y

BLUE - B


GREEN - G

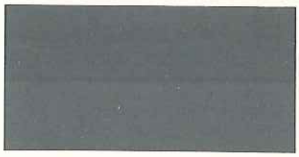
ORANGE - O


WHITE - W

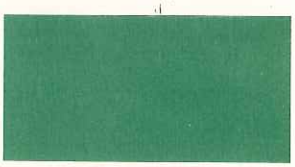
BLACK - BK

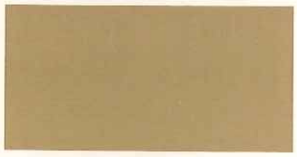
BROWN - BR

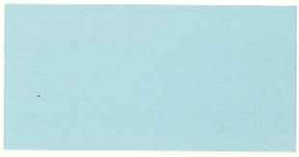
VIOLET - VL


VALVE GRAY - VG

PINK - P

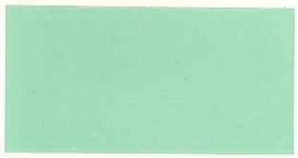

ELECTRICAL GREEN - EG


TAN - T

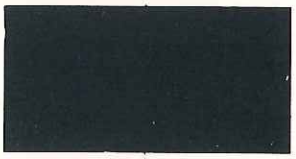

LIGHT BLUE - LB

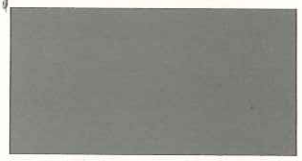
PURPLE - PP

TRANSLUCENT BLUE - TB


TRANSLUCENT GREEN - TG

CONCRETE GRAY - CG


STEEL GRAY - SG


VESSEL & EQUIPMENT GRAY - VE

NOT SHOWN — CLEAR - C

WHEN ORDERING, TO DESIGNATE COLOR REQUIRED, COLOR CODE MUST BE INCLUDED WITH PRODUCT CODE.

EXAMPLE: TO ORDER YELLOW PIPE SIZE 8
P-Y-8

SOME OF OUR PRODUCTS HAVE THE COLOR DESIGNATION AT THE END OF THE CODE.

EXAMPLE: TO ORDER PINK CONTROL VALVE SIZE 2
MV-2P

AVAILABLE COLORS FOR EACH ITEM ARE LISTED ON IT'S PAGE, ALONG WITH THE METHOD OF COLOR DESIGNATION.

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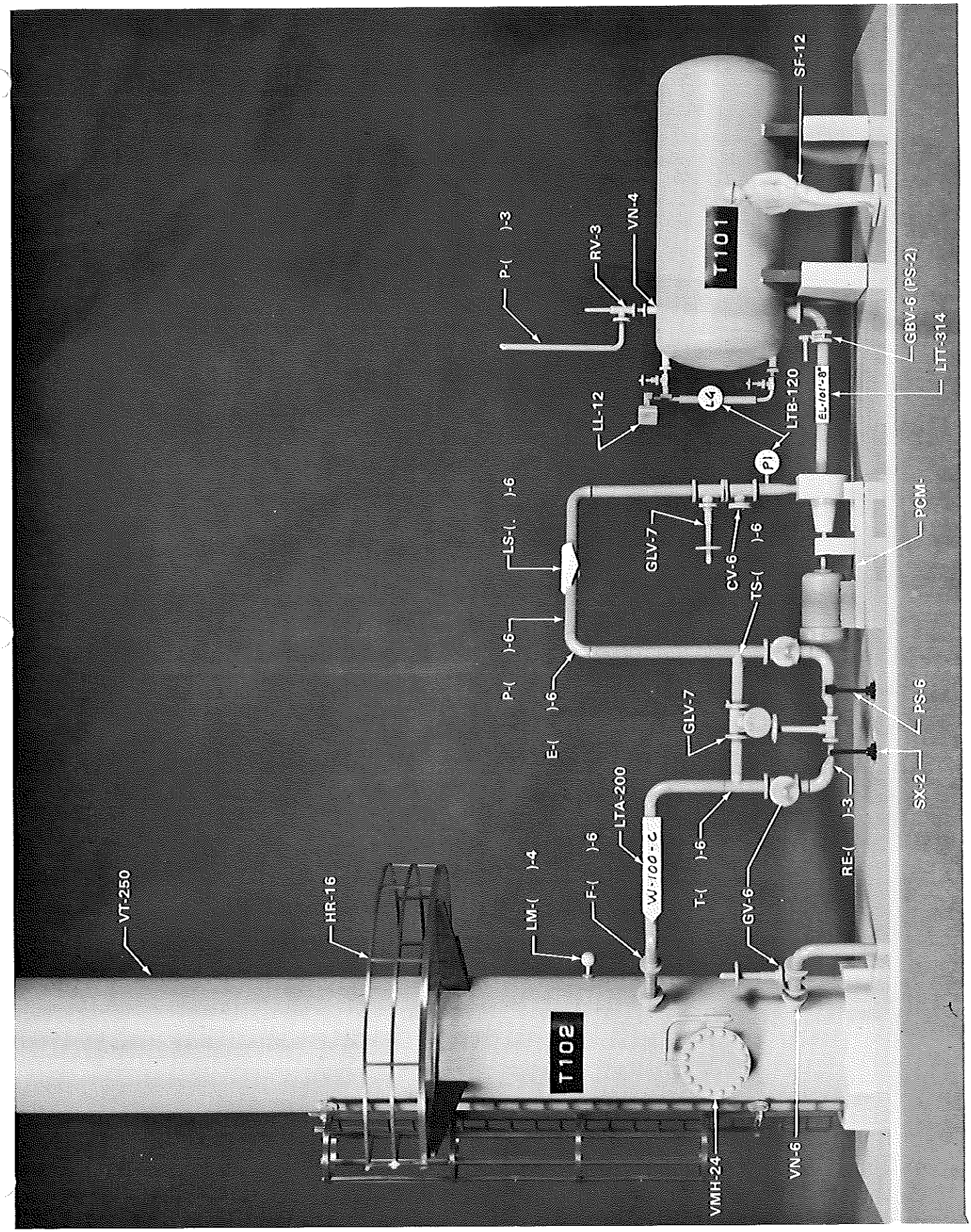
VT-250
HR-16
VMH-24
T102
T101
SF-12
VN-4
RV-3
P-( )-3
LL-12
LTB-120
LTT-314
GBV-6 (PS-2)
PGM-
PS-6
SX-2
VN-6
RE-( )-3
GV-6
T-( )-6
LM-( )-4
F-( )-6
LTA-200
W1100-C
E-( )-6
P-( )-6
LS-( )-6
GLV-7
CV-6
TS-( )-6
P1
P2

FULL SCALE PIPING SYSTEM

SUGGESTIONS FOR WORKING WITH FULL SCALE PIPING SYSTEM

This entire system is designed for the rapid and easy assembly of model piping with a minimum of tools. It does not require the ability of a craftsman to install neat and accurate pipe runs. In design, a model is only as valuable as the information that may be developed with it and obtained from it. With the E.M.A. System, the model program will lead the design.

The material used in this piping medium is Butyrate plastic. It has proven to be ideal because it is so convenient to work with; it can be cut, turned, drilled, painted and easily cemented. Pipe and fittings are manufactured to provide a good friction fit and maintain the outside diameter; splines on the male fittings accomplish a tight fit and prevent undesired rotation – and still allow intentional turning. This feature permits cementing to be a final operation. The telescoping sizes of the pipe combined with the workability makes improvisation quite simple. The material is light in weight and extremely sturdy so that shipping a completed model is simplified.

CUTTING: Pipe should be cut clean and square. Use a Zona Saw or a power saw with a plastic cutting blade. The 3/32" and 1/8" pipe can be readily cut with a Razor Knife. The 1/32", 1/16", 3/32" and 1/8" with metal cores can be cut cleanly with diagonal cutting pliers which have been ground flat on their back surface. (See Tool Section)

CEMENTING: The Plastic Piping Cement is ideal for this material. It makes a firm joint, will not blush and is fast drying. The cement will flow readily and just a drop is required to make a joint. A small amount of pressure will improve the bond.

MACHINING: Butyrate can be lathe-turned in the same manner as brass, cast Lucite or Plexiglas. Grind the cutting tool to provide chip clearance. The resultant turnings will have a polished surface. This material can also be drilled, tapped, carved or saw cut. Very slow speed is required for machine sanding.

ATTACHING FITTINGS: Fittings can be more readily attached to pipe, particularly in sizes 5/16" and over, if the pipe is screwed onto the fitting. Always rotate the pipe in the same direction whether attaching or removing the fitting.

DRILL SIZES FOR COUPLING PINS AND MALE FITTINGS

Pipe or fitting code number	1	2	3	4	6	8	10	12	14	16	18	20	24
Pipe diameter	1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
Drill size	#56	#50	#54	#51	#41	#30	3/16	1/4	5/16	3/8	7/16	1/2	5/8

DRILL SIZES TO RECEIVE PIPE SUPPORTS

Pipe support code number	1	2	3	4	6	8	10	12	14	16	18	20	24
For pipe size	1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
Drill size	#51						#43						

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SUGGESTIONS FOR WORKING WITH FULL SCALE PIPING SYSTEM

In all manufactured items there must be some degree of tolerance. Despite the limited tolerance allowed in this system there may be instances when a fitting-to-pipe connection may be either a little too loose or tight. The loose fit is easily corrected by slightly crimping the male fitting. To correct the tight fit merely ream the pipe with the drill recommended for coupling pins (previous page).

PAINTING: Because these materials are supplied in a variety of colors, painting will not normally be required. However, our paint - pages 283 & 284 - match all piping, structural, and equipment colors.

TELESCOPING: Sleeving down in size is frequently advantageous when, for example a large pipe is to be joined to a vessel. Rather than drill the large hole in the vessel to receive the coupling pin required for the pipe size, sleeve down to a smaller pipe size with the resultant smaller hole requirement. Scraps of pipe too, can be used instead of coupling pins for joining pipe. In making mitre joints, the double wall thickness; because of greater surface area, will improve the bond.

FLANGES: Small flanges are split to allow some oversize tolerance of piping. To install on lines where it is not convenient to slide into position - make second slit opposite the first and install in two pieces. On piping 7/8" and over, exchanger flanges can be used to indicate nozzles and break-out flanges.

PHOTOGRAPHY Photography is an essential part of the model program. It is the means of obtaining 'record prints', progress reports and of getting comments from parties who might not have access to the model itself. Photos are valuable to the field construction forces to supplement their normal 'blue-prints'. With the rapid advances in the photo-drawing technique, photographs will replace a large percentage of drawings.

Full Scale Piping will photograph beautifully in color. For black and white photography we suggest that orthochromatic film be used rather than panchromatic so that the color differentiation can be used to advantage. The use of filters will improve color contrast and allow selective differentiation. Highlights can be eliminated with the use of dulling spray.

ASSEMBLY OF PIPING: Vessels and equipment pieces can frequently be piped as subassemblies before being mounted on the model board. Cementing, wherever possible, should be a final operation. In the small sizes (3/32" and 1/8"), we recommend that the metal rod inserts be used in the pipe not only to add stiffness, but to eliminate the use of fittings. Pipe with the wire insert can be quickly and easily bent to simulate elbows, however, for 'close-fit' work, the fittings will save time.

Stub-In Tees and Snap-On Tees were designed to allow the use of a Tee anywhere in a line without the necessity of cutting the line to receive the standard Tee. Increasing the radius of the contour of the Stub-In Tee with a round or half round file, or with sandpaper wrapped around the desired sized pipe, will allow it to be used as a reducing tee. Small sizes of reducing tees are provided.

THERMAL EXPANSION: All materials are affected by heat. Plastics are no exception. Butyrate will expand .00006" per°F per inch. Some consideration must be given this property when installing long runs of piping or when planning shipment of finished models.

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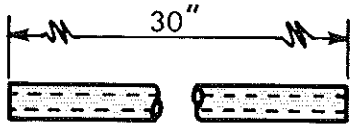
FULL SCALE PIPING SYSTEM

PLASTIC COATED WIRE PIPING

CODE ✶	ACTUAL SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
P - ( ) - 1	1/32"	1-1/2 OR 2	1 OR 1-1/2	3/4 OR 1	1/2 OR 3/4
P - ( ) - 2	1/16"	3	2	1 - 1/2	1

Plastic coated steel rod. Bends can be made in the same manner as with center-line piping – by actually making the bend. No elbows are required. The material will retain its shape and be firm and straight. Fittings for joining and attaching are described on succeeding pages.

FULL SCALE PLASTIC PIPE



	CODE ✶	ACTUAL SIZE	SCALE SIZE IN INCHES			
			1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
▲	P - ( ) - 3	3/32"	4	3	2	1-1/2
▲	P - ( ) - 4	1/8"	6	4	3	2
	P - ( ) - 6	3/16"	8 OR 10	6	4	3
	P - ( ) - 8	1/4"	12	8	6	4
	P - ( ) - 10	5/16"	14 OR 16	10	8	5
	P - ( ) - 12	3/8"	18	12	—	6
	P - ( ) - 14	7/16"	20	14	10	—
	P - ( ) - 16	1/2"	24	16	12	8
	P - ( ) - 18	9/16"	28	18	14	—
	P - ( ) - 20	5/8"	30	20	16	10
	P - ( ) - 24	3/4"	36	24	18	12
	P - ( ) - 28	7/8"	42	28	20 OR 22	14
	P - ( ) - 32	1"	48	32	24	16
	P - ( ) - 36	1-1/8"	54	36	26 OR 28	18
	P - ( ) - 40	1-1/4"	60	40	30	20
	P - ( ) - 150	1-1/2"	72	48	36	24
	P - ( ) - 175	1-3/4"	84	56	42	28
	P - ( ) - 200	2"	96	64	48	32

For Larger Sizes See Vessel Tubing

▲ Metal rod is available to fit these sizes of pipe to add stiffness and allow bends without the use of elbows (See page 7). Fittings for joining and attaching are described on succeeding pages.

✶

SIZE	EMA COLORS															
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
1 - 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6 - 8	X	X	X	X	X	X	X	X	X	X		X				
10 - 40	X	X	X	X	X	X	X	X	X	X						
150 - 200	X	X	X	X	X	X										

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

NOTE: TO REPRESENT UNDERGROUND PIPING, SEE BUTYRATE STRIP STOCK (BSS) PAGE 17.

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COUPLING PINS

CODE	TO FIT PIPE
CP-3	P - ( ) - 3
CP-4	P - ( ) - 4
CP-6	P - ( ) - 6
CP-8	P - ( ) - 8
CP-10	P - ( ) - 10
CP-12	P - ( ) - 12
CP-14	P - ( ) - 14
CP-16	P - ( ) - 16
CP-18	P - ( ) - 18
CP-20	P - ( ) - 20
CP-24	P - ( ) - 24

Coupling Pins are not provided for sizes over 3/4".

Use scrap pieces of telescoping pipe.

Coupling pins are colorless and can be used with any color of Pipe.

Pins are provided in maximum required lengths and can easily be trimmed to shorter lengths when required.

MATERIAL: BUTYRATE

COUPLING SLEEVES

CODE	TO FIT PIPE
CS-1	P - ( ) - 1
CS-2	P - ( ) - 2
CS-3	P - ( ) - 3
CS-4	P - ( ) - 4

Sleeves are colorless an can be used with any color pipe.

MATERIAL: BUTYRATE

METAL ROD 31" STRAIGHT LENGTHS

CODE	TO FIT PIPE
BRO-47	P - ( ) - 3
BRO-60	P - ( ) - 4

NOTE: When BRO-47 and P - ( ) - 3 or BRO-60 and P -( ) - 4 are ordered in similar quantities we will insert the metal rod at no additional cost.

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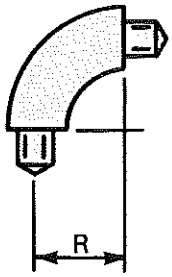
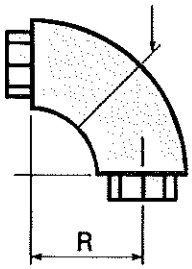
FULL SCALE PIPING SYSTEM

L.R. 90° ELBOWS



RADIUS = 1½ x DIA.

INDEX MARK FOR CUTTING 45° ELBOWS



1½ x DIA.

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
E - ( ) - 3	3/32"	4	3	2	1-1/2
E - ( ) - 4	1/8"	6	4	3	2
E - ( ) - 6	3/16"	8 OR 10	6	4	3
E - ( ) - 8	1/4"	12	8	6	4
E - ( ) - 10	5/16"	14 OR 16	10	8	5
E - ( ) - 12	3/8"	18	12	—	6
E - ( ) - 14	7/16"	20	14	10	—
E - ( ) - 16	1/2"	24	16	12	8
E - ( ) - 18	9/16"	28	18	14	—
E - ( ) - 20	5/8"	30	20	16	10
E - ( ) - 24	3/4"	36	24	18	12
E - ( ) - 28	7/8"	42	28	20 OR 22	14
E - ( ) - 32	1"	48	32	24	16
E - ( ) - 36	1-1/8"	54	36	26 OR 28	18
E - ( ) - 40	1-1/4"	60	40	30	20
● E-150	1-1/2"	72	48	36	24
● E-175	1-3/4"	84	56	42	28
● E-200	2"	96	64	48	32

E-150, 175 & 200

● NOTES: 1. COLOR: Vessel and Equipment Gray.
Elbows come in two halves which snap together.

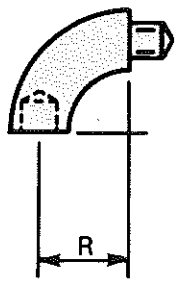
✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 - 4	X	X	X	X	X	X	X	X	X	X						
6 - 8	X	X	X	X	X	X	X	X	X	X		X				
10 - 40	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

L.R. 90° FEMALE ELBOWS



RADIUS = 1½ x DIA.

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
EF - ( ) - 3	3/32"	4	3	2	1-1/2
EF - ( ) - 4	1/8"	6	4	3	2
EF - ( ) - 6	3/16"	8 OR 10	6	4	3
EF - ( ) - 8	1/4"	12	8	6	4
EF - ( ) - 10	5/16"	14 OR 16	10	8	5
EF - ( ) - 12	3/8"	18	12	—	6
EF - ( ) - 14	7/16"	20	14	10	—
EF - ( ) - 16	1/2"	24	16	12	8
EF - ( ) - 18	9/16"	28	18	14	—
EF - ( ) - 20	5/8"	30	20	16	10
EF - ( ) - 24	3/4"	36	24	18	12

Female fittings are designed to facilitate fitting-to-fitting connections.

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 - 24	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

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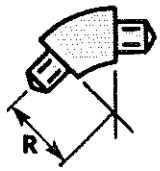
45° ELBOWS

CODE *	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
A - ( ) - 3	3/32"	4	3	2	1-1/2
A - ( ) - 4	1/8"	6	4	3	2
A - ( ) - 6	3/16"	8 OR 10	6	4	3
A - ( ) - 8	1/4"	12	8	6	4
A - ( ) - 10	5/16"	14 OR 16	10	8	5
A - ( ) - 12	3/8"	18	12	—	6
A - ( ) - 14	7/16"	20	14	10	—
A - ( ) - 16	1/2"	24	16	12	8
A - ( ) - 18	9/16"	28	18	14	—
A - ( ) - 20	5/8"	30	20	16	10
A - ( ) - 24	3/4"	36	24	18	12
A - ( ) - 28	7/8"	42	28	20 OR 22	14
A - ( ) - 32	1"	48	32	24	16
A - ( ) - 36	1-1/8"	54	36	26 OR 28	18
A - ( ) - 40	1-1/4"	60	40	30	20



RADIUS = 1½ x DIA.

NOTE: SEE PRECEEDING PAGE FOR LARGER 45° ELBOWS.

*

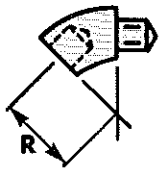
SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 - 4	X	X	X	X	X	X	X	X	X	X						
6 - 8	X	X	X	X	X	X	X	X	X	X		X				
10 - 40	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

45° FEMALE ELBOWS

CODE *	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
AF - ( ) - 3	3/32"	4	3	2	1-1/2
AF - ( ) - 4	1/8"	6	4	3	2
AF - ( ) - 6	3/16"	8 OR 10	6	4	3
AF - ( ) - 8	1/4"	12	8	6	4
AF - ( ) - 10	5/16"	14 OR 16	10	8	5
AF - ( ) - 12	3/8"	18	12	—	6
AF - ( ) - 14	7/16"	20	14	10	—
AF - ( ) - 16	1/2"	24	16	12	8
AF - ( ) - 18	9/16"	28	18	14	—
AF - ( ) - 20	5/8"	30	20	16	10
AF - ( ) - 24	3/4"	36	24	18	12



RADIUS = 1½ x DIA.

Female fittings are designed to facilitate fitting-to-fitting connections.

*

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 -24	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

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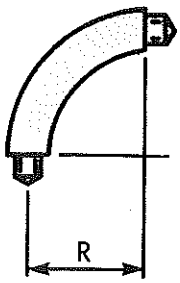
FULL SCALE PIPING SYSTEM

THREE DIAMETER BENDS



RADIUS = 3 x DIA.

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
B3 - ( ) - 6	3/16"	8 OR 10	6	4	3
B3 - ( ) - 8	1/4"	12	8	6	4
B3 - ( ) - 10	5/16"	14 OR 16	10	8	5
B3 - ( ) - 12	3/8"	18	12	—	6
B3 - ( ) - 14	7/16"	20	14	10	—
B3 - ( ) - 16	1/2"	24	16	12	8
B3 - ( ) - 18	9/16"	28	18	14	—
B3 - ( ) - 20	5/8"	30	20	16	10
B3 - ( ) - 24	3/4"	36	24	18	12
B3 - ( ) - 28	7/8"	42	28	20 OR 22	14
B3 - ( ) - 32	1"	48	32	24	16
B3 - ( ) - 36	1-1/8"	54	36	26 OR 28	18
B3 - ( ) - 40	1-1/4"	60	40	30	20

✶

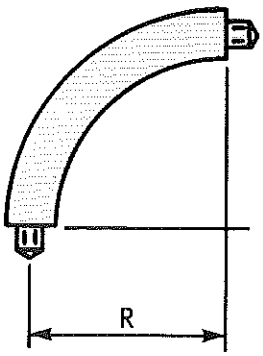
SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
6 - 40	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

Because bends can be easily accomplished by using the metal cores with the smaller size pipe, fittings are not provided for those sizes.

FIVE DIAMETER BENDS



RADIUS = 5 x DIA.

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
B - ( ) - 6	3/16"	8 OR 10	6	4	3
B - ( ) - 8	1/4"	12	8	6	4
B - ( ) - 10	5/16"	14 OR 16	10	8	5
B - ( ) - 12	3/8"	18	12	—	6
B - ( ) - 14	7/16"	20	14	10	—
B - ( ) - 16	1/2"	24	16	12	8
B - ( ) - 18	9/16"	28	18	14	—
B - ( ) - 20	5/8"	30	20	16	10
B - ( ) - 24	3/4"	36	24	18	12

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
6 - 24	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

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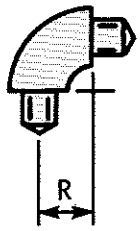
SHORT RADIUS 90° ELBOWS

CODE *	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
ES - ( ) - 4	1/8"	6	4	3	2
ES - ( ) - 6	3/16"	8 OR 10	6	4	3
ES - ( ) - 8	1/4"	12	8	6	4
ES - ( ) -10	5/16"	14 OR 16	10	8	5
ES - ( ) - 12	3/8"	18	12	—	6
ES - ( ) - 14	7/16"	20	14	10	—
ES - ( ) - 16	1/2"	24	16	12	8
ES - ( ) - 18	9/16"	28	18	14	—
ES - ( ) - 20	5/8"	30	20	16	10
ES - ( ) - 24	3/4"	36	24	18	12
ES - ( ) - 28	7/8"	42	28	20 OR 22	14
ES - ( ) - 32	1"	48	32	24	16
ES - ( ) - 36	1-1/8"	54	36	26 OR 28	18
ES - ( ) - 40	1-1/4"	60	40	30	20



RADIUS = 1 x DIA.

*

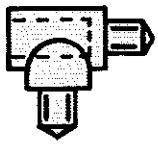
SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
4 - 8	X	X	X	X	X	X	X	X	X	X		X				
10 - 40	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

TEES

CODE *	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
T - ( ) -3	3/32"	4	3	2	1-1/2
T - ( ) -4	1/8"	6	4	3	2
T - ( ) -6	3/16"	8 OR 10	6	4	3
T - ( ) -8	1/4"	12	8	6	4
T - ( ) -10	5/16"	14OR 16	10	8	5
T - ( ) -12	3/8"	18	12	—	6
T - ( ) -14	7/16"	20	14	10	—
T - ( ) -16	1/2"	24	16	12	8
T - ( ) -18	9/16"	28	18	14	—
T - ( ) -20	5/8"	30	20	16	10
T - ( ) -24	3/4"	36	24	18	12



*

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 - 4	X	X	X	X	X	X	X	X	X	X						
6 - 8	X	X	X	X	X	X	X	X	X	X		X				
10 - 24	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

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FULL SCALE PIPING SYSTEM

STUB-IN TEES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
TS - ( ) - 6	3/16"	8 OR 10	6	4	3
TS - ( ) - 8	1/4"	12	8	6	4
TS - ( ) - 10	5/16"	14 OR 16	10	8	5
TS - ( ) - 12	3/8"	18	12	—	6
TS - ( ) - 14	7/16"	20	14	10	—
TS - ( ) - 16	1/2"	24	16	12	8
TS - ( ) - 18	9/16"	28	18	14	—
TS - ( ) - 20	5/8"	30	20	16	10
TS - ( ) - 24	3/4"	36	24	18	12
TS - ( ) - 28	7/8"	42	28	20 OR 22	14
TS - ( ) - 32	1"	48	32	24	16
TS - ( ) - 36	1-1/8"	54	36	26 OR 28	18
TS - ( ) - 40	1-1/4"	60	40	30	20
● TS - 150	1-1/2"	72	48	36	24
● TS - 175	1-3/4"	84	56	42	28
● TS - 200	2"	96	64	48	32

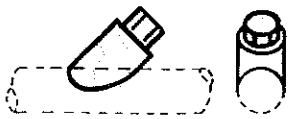
● NOTE:
- These fittings work with tubing shown on pages 6 & 83
- COLOR: Vessel and Equipment Gray.
- Precision molded of ABS plastic.

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
6 - 40	X	X	X	X	X	X	X	X	X	X						
SEE PAGE 2 FOR COLOR CHART																

MATERIAL: BUTYRATE

FOR SNAP-ON TEES SEE PAGE 14



45° STUB-IN TEES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
TSA - ( ) - 6	3/16"	8 OR 10	6	4	3
TSA - ( ) - 8	1/4"	12	8	6	4
TSA - ( ) - 10	5/16"	14 OR 16	10	8	5
TSA - ( ) - 12	3/8"	18	12	—	6
TSA - ( ) - 14	7/16"	20	14	10	—
TSA - ( ) - 16	1/2"	24	16	12	8
TSA - ( ) - 18	9/16"	28	18	14	—
TSA - ( ) - 20	5/8"	30	20	16	10
TSA - ( ) - 24	3/4"	36	24	18	12

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
6 - 24	X	X	X	X	X	X	X	X	X	X						
SEE PAGE 2 FOR COLOR CHART																

MATERIAL: BUTYRATE

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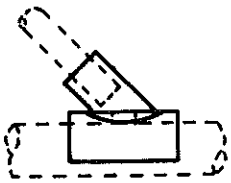
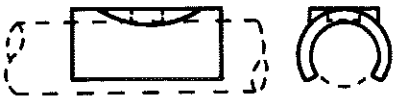
LATERALS, REDUCING LATERALS & REDUCING TEES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
BTL-( )-2	1/16"	3	2	1-1/2	1
BT-( )-3	3/32"	4	3	2	1-1/2
BT-( )-4	1/8"	6	4	3	2
BT-( )-6	3/16"	8 OR 10	6	4	3
RT-( )-2	1/16"	3	2	1-1/2	1
RT-( )-3	3/32"	4	3	2	1-1/2
RT-( )-4	1/8"	6	4	3	2
LT-( )-2	1/16"	3	2	1-1/2	1
LT-( )-3	3/32"	4	3	2	1-1/2
LT-( )-4	1/8"	6	4	3	2
LT-( )-6	3/16"	8 OR 10	6	4	3



BTL-2



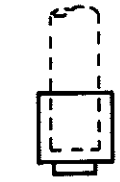
BT-3, 4 & 6

✶Fill in code letter when ordering to designate color. C — Clear W — White

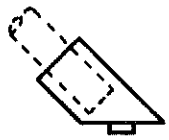
AVAILABLE IN WHITE & CLEAR ONLY. MATERIAL: BUTYRATE

Clear Fittings can be used with any color pipe.

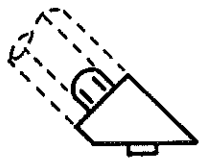
EXAMPLES OF APPLICATION AND SELECTION			
DESIRED CONFIGURATION	HEADER PIPE SIZE	BRANCH OR LATERAL PIPE SIZE	USE FITTINGS
45° LATERALS	1/16"	1/16"	BTL-2
	3/32"	3/32"	BT-3 & LT-3
	1/8"	1/8"	BT-4 & LT-4
	3/16"	3/16"	BT-6 & LT-6
REDUCING LATERALS	3/32"	1/16"	BT-3 & LT-2
	1/8"	1/16"	BT-4 & LT-2
	1/8"	3/32"	BT-4 & LT-3
	3/16"	1/16"	BT-6 & LT-2
	3/16"	3/32"	BT-6 & LT-3
	3/16"	1/8"	BT-6 & LT-4
REDUCING TEES	3/32"	1/16"	BT-3 & RT-2
	1/8"	1/16"	BT-4 & RT-2
	1/8"	3/32"	BT-4 & RT-3
	3/16"	1/16"	BT-6 & RT-2
	3/16"	3/32"	BT-6 & RT-3
	3/16"	1/8"	BT-6 & RT-4



RT-2, 3 & 4

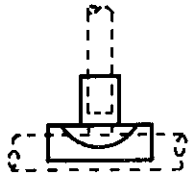


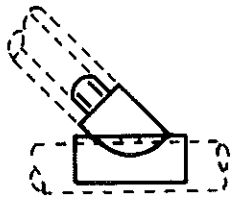
LT-2, 3 & 4

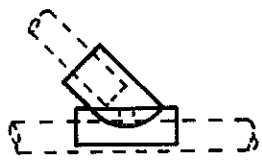


LT-6

FOR STRAIGHT TEES SEE PRECEDING PAGES.







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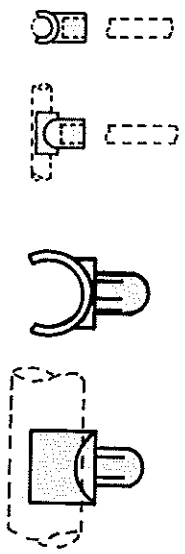
FULL SCALE PIPING SYSTEM



SNAP-ON TEES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
TF - ( ) - 1	1/32	1-1/2 OR 2	1 OR 1-1/2	3/4 OR 1	1/2 OR 3/4
TF - ( ) - 2	1/16"	3	2	1-1/2	1
TF - ( ) - 3	3/32"	4	3	2	1-1/2
TF - ( ) - 4	1/8"	6	4	3	2
TF - ( ) - 6	3/16"	8 OR 10	6	4	3
TF - ( ) - 8	1/4"	12	8	6	4
TF - ( ) - 10	5/16"	14 OR 16	10	8	5
TF - ( ) - 12	3/8"	18	12	—	6
TF - ( ) - 14	7/16"	20	14	10	—
TF - ( ) - 16	1/2"	24	16	12	8
TF - ( ) - 18	9/16"	28	18	14	—
TF - ( ) - 20	5/8"	30	20	16	10
TF - ( ) - 24	3/4"	36	24	18	12

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
1 - 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6 - 24						X									X	

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

ECCENTRIC REDUCERS

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
RE - ( ) - 3	3/16" x 3/32"	8 OR 10 x 4	6 x 3	4 x 2	3 x 1½
RE - ( ) - 4	1/4" x 1/8"	12 x 6	8 x 4	6 x 3	4 x 2
RE - ( ) - 6	5/16" x 3/16"	14 OR 16x8 OR 10	10 x 6	8 x 4	5 x 3
RE - ( ) - 8	3/8" x 1/4"	18 x 12	12 x 8	—	6 x 4
RE - ( ) - 10	7/16" x 5/16"	20 x 14 OR 16	14 x 10	10 x 8	—
RE - ( ) - 12	1/2" x 3/8"	24 x 18	16 x 12	—	8 x 6
RE - ( ) - 13	9/16" x 7/16"	28 x 20	18 x 14	14 x 10	—
RE - ( ) - 14	5/8" x 7/16"	30 x 20	20 x 14	16 x 10	—
RE - ( ) - 16	3/4" x 1/2"	36 x 24	24 x 16	18 x 12	12 x 8
RE - ( ) - 18	3/4" x 9/16"	36 x 28	24 x 18	18 x 14	—

Eccentric reducers have an index mark to locate top of pipe.

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 - 18	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

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CONCENTRIC REDUCERS

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
R-( )-2	3/16 x 3/32	8 or 10 x 4	6 x 3	4 x 2	3 x 1-1/2
R-( )-3	1/8 x 3/32	6 x 4	4 x 3	3 x 2	2 x 1-1/2
R-( )-4	3/16 x 1/8	8 or 10 x 6	6 x 4	4 x 3	3 x 2
R-( )-5	1/4 x 1/8	12 x 6	8 x 4	6 x 3	4 x 2
R-( )-6	1/4 x 3/16	12 x 8 or 10	8 x 6	6 x 4	4 x 3
● R-(W)-43	5/16 x 1/8	14 or 16 x 6	10 x 4	8 x 3	—
R-( )-7	5/16 x 3/16	14 or 16 x 8 or 10	10 x 6	8 x 4	5 x 3
R-( )-8	5/16 x 1/4	14 or 16 x 12	10 x 8	8 x 6	5 x 4
● R-(W)-63	3/8 x 3/16	18 x 8 or 10	12 x 6	—	6 x 3
R-( )-9	3/8 x 1/4	18 x 12	12 x 8	—	6 x 4
R-( )-10	3/8 x 5/16	18 x 14 or 16	12 x 10	—	6 x 5
● R-(W)-64	7/16 x 3/16	20 x 8 or 10	14 x 6	10 x 4	—
● R-(W)-83	7/16 x 1/4	20 x 12	14 x 8	10 x 6	—
R-( )-11	7/16 x 5/16	20 x 14 or 16	14 x 10	10 x 8	—
R-( )-12	7/16 x 3/8	20 x 18	14 x 12	—	—
● R-(W)-84	1/2 x 1/4	24 x 12	16 x 8	12 x 6	8 x 4
● R-(W)-103	1/2 x 5/16	24 x 14 or 16	16 x 10	12 x 8	—
R-( )-13	1/2 x 3/8	24 x 18	16 x 12	—	8 x 6
R-( )-14	1/2 x 7/16	24 x 20	16 x 14	12 x 10	—
● R-(W)-104	9/16 x 5/16	28 x 14 or 16	18 x 10	14 x 8	—
● R-(W)-123	9/16 x 3/8	28 x 18	18 x 12	—	—
R-( )-17	9/16 x 7/16	28 x 20	18 x 14	14 x 10	—
R-( )-15	9/16 x 1/2	28 x 24	18 x 16	14 x 12	—
● R-(W)-124	5/8 x 3/8	30 x 18	20 x 12	—	10 x 6
● R-(W)-143	5/8 x 7/16	30 x 20	20 x 14	16 x 10	—
R-( )-16	5/8 x 1/2	30 x 24	20 x 16	16 x 12	10 x 8
R-( )-18	5/8 x 9/16	30 x 28	20 x 18	16 x 14	—
● R-(W)-163	3/4 x 1/2	36 x 24	24 x 16	18 x 12	12 x 8
R-( )-19	3/4 x 9/16	36 x 28	24 x 18	18 x 14	—
R-( )-20	3/4 x 5/8	36 x 30	24 x 20	18 x 16	12 x 10
● R-(W)-183	7/8 x 9/16	42 x 28	28 x 18	20 x 14	—
● R-(W)-202	7/8 x 5/8	42 x 30	28 x 20	20 x 16	14 x 10
● R-(W)-241	7/8 x 3/4	42 x 36	28 x 24	20 x 18	14 x 12
● R-(W)-242	1 x 3/4	48 x 36	32 x 24	24 x 18	16 x 12
● R-(W)-281	1 x 7/8	48 x 42	32 x 28	24 x 20	16 x 14
● R-(W)-324	1-1/8 x 3/4	54 x 36	36 x 24	28 x 18	18 x 12
● R-(W)-328	1-1/8 x 7/8	54 x 42	36 x 28	28 x 20	18 x 14
● R-(W)-330	1-1/8 x 1	54 x 48	36 x 32	28 x 24	18 x 16

● AVAILABLE ONLY IN WHITE.

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
2 - 20	X	X	X	X	X	X	X	X	X	X						

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

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FULL SCALE PIPING SYSTEM

WELD CAPS

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
W - ( ) - 3	3/32"	4	3	2	1-1/2
W - ( ) - 4	1/8"	6	4	3	2
W - ( ) - 6	3/16"	8 OR 10	6	4	3
W - ( ) - 8	1/4"	12	8	6	4
W - ( ) - 10	5/16"	14 OR 16	10	8	5
W - ( ) - 12	3/8"	18	12	—	6
W - ( ) - 14	7/16"	20	14	10	—
W - ( ) - 16	1/2"	24	16	12	8
W - ( ) - 18	9/16"	28	18	14	—
W - ( ) - 20	5/8"	30	20	16	10
W - ( ) - 24	3/4"	36	24	18	12
W - ( ) - 28	7/8"	42	28	20 OR 22	14
W - ( ) - 32	1"	48	32	24	16
W - ( ) - 36	1-1/8"	54	36	26 OR 28	18
W - ( ) - 40	1-1/4"	60	40	30	20

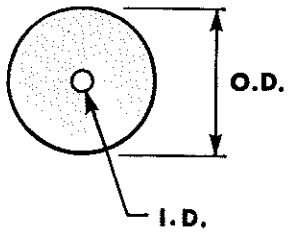
✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 - 40	X	X	X	X	X	X	X	X	X	X						

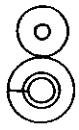
SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

DISCS (Valve Handwheels)



Attach Discs to Flanges to show Spectacle Blind Flanges.
Trim edge of Discs flat before cementing.



CODE ✶	ACTUAL O.D.	ACTUAL I.D.
D-8	1/4"	3/32"
D-12	3/8"	3/32"
D-16	1/2"	3/32"
D-20	5/8"	3/32"
D-24	3/4"	3/32"
D-28	7/8"	3/32"
D-32	1"	3/32"
D-36	1-1/8"	3/32"
D-39	1-1/4"	3/32"
D-40	1-1/4"	3/16"
D-48	1-1/2"	3/16"
D-56	1-3/4"	3/16"
D-60	1-7/8"	3/16"
D-72	2-1/4"	3/16"
D-84	2-5/8"	3/16"

✶ Colors: Valve Gray, Pink and Black.
MATERIAL: BUTYRATE
Code as shown is for Valve Gray color. To order in Pink or Black add P or BK to code: Example: D-8P or D-8BK.

Pink is the color designated for Instrumentation.

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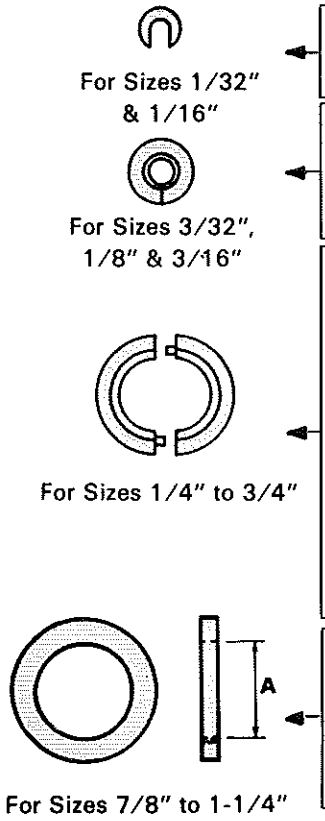
BREAK-OUT AND ORIFICE FLANGES



CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
F - ( ) - 1	1/32"	1-1/2 OR 2	1 OR 1-1/2	3/4 OR 1	1/2 OR 3/4
F - ( ) - 2	1/16"	3	2	1-1/2	1
F - ( ) - 3	3/32"	4	3	2	1-1/2
F - ( ) - 4	1/8"	6	4	3	2
F - ( ) - 6	3/16"	8 OR 10	6	4	3
F - ( ) - 8	1/4"	12	8	6	4
F - ( ) - 10	5/16"	14 OR 16	10	8	5
F - ( ) - 12	3/8"	18	12	—	6
F - ( ) - 14	7/16"	20	14	10	—
F - ( ) - 16	1/2"	24	16	12	8
F - ( ) - 18	9/16"	28	18	14	—
F - ( ) - 20	5/8"	30	20	16	10
F - ( ) - 24	3/4"	36	24	18	12
F - ( ) - 28	7/8"	42	28	20 OR 22	14
F - ( ) - 32	1"	48	32	24	16
F - ( ) - 36	1-1/8"	54	36	26 OR 28	18
F - ( ) - 40	1-1/4"	60	40	30	20

✶

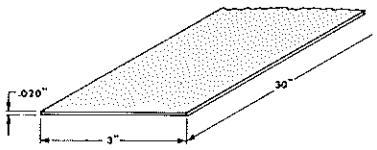
SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
1 - 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	X	X	X	X	X	X	X	X	X	X	X	X				
8 - 40	X	X	X	X	X	X	X	X	X	X	X					

SEE PAGE 2 FOR COLOR CHART

Colors in Valve Gray and Pink represent Orifice or Spectacle Blind Flanges.

Pink is the color designated for Instrumentation.

FOR EXCHANGER AND SMALL FLANGES SEE PAGE 87.



BUTYRATE STRIP STOCK

CODE
BSS-( )-300

For representing underground piping, conduit and trenches. Replaces normally used color tapes. Will not peel up or deteriorate with age. Easily slit to any width.

✶

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	SG
300		X					X		X			X		X		X

SEE PAGE 2 FOR COLOR CHART

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FULL SCALE PIPING SYSTEM

Thickness: LS-2 is 1/64"
LS-3 is 3/64"
All others are 1/16" thick.

Greater thickness can be indicated by laminating sleeves.

COLORS	SUGGESTED INDICATION
White	— Personnel Protection
Electrical Green	— Electrical Traced
Light Blue	— Steam Traced
Purple	— Cold Insulation

INSULATION SLEEVES

CODE ✶	TO FIT PIPE
LS - ( ) - 2	P - ( ) - 2
LS - ( ) - 3	P - ( ) - 3
LS - ( ) - 4	P - ( ) - 4
LS - ( ) - 6	P - ( ) - 6
LS - ( ) - 8	P - ( ) - 8
LS - ( ) - 10	P - ( ) - 10
LS - ( ) - 12	P - ( ) - 12
LS - ( ) - 14	P - ( ) - 14
LS - ( ) - 16	P - ( ) - 16
LS - ( ) - 18	P - ( ) - 18
LS - ( ) - 20	P - ( ) - 20
LS - ( ) - 24	P - ( ) - 24
LS - ( ) - 28	P - ( ) - 28
LS - ( ) - 32	P - ( ) - 32
LS - ( ) - 36	P - ( ) - 36
LS - ( ) - 40	P - ( ) - 40

Packaged in bags of 50's.
Minimum order one bag of 50 pieces.

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
2 - 40						X						X		X		X

SEE PAGE 2 FOR COLOR CHART

MATERIAL: BUTYRATE

SUPPORT FLANGES

CODE ✶	TO FIT	
	PIPE SUPPORTS	PIPE SIZE
SX-1	—	P - ( ) - 1
SX-2	PS-1 thru 8	P - ( ) - 2
SX-3	PS-10 thru 24	P - ( ) - 3
SX-4	—	P - ( ) - 4

MATERIAL: ACRYLIC

✶ Colors: Valve Gray, Clear & Black.

{ Code as shown is for Valve Gray color. To order in Clear or Black, add C or BK to Code. Example: SX-2C or SX-3BK.

Support Flanges provide a surface for cementing to base boards or structure without drilling. Ideal for supporting lights, instruments, hung piping and attaching Ladder Clips to Vessels.

SEE FICTITIOUS SUPPORT SYSTEM, PAGES 149 & 150

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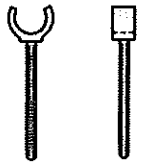
PIPE SUPPORT CLIPS

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE PIPE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
PS-1	1/32"	1-1/2 OR 2	1 OR 2	3/4 OR 1	1/2 OR 3/4
PS-2	1/16"	3	2	1-1/2	1
PS-3	3/32"	4	3	2	1-1/2
PS-4	1/8"	6	4	3	2
PS-6	3/16"	8 OR 10	6	4	3
PS-8	1/4"	12	8	6	4
PS-10	5/16"	14 OR 16	10	8	5
PS-12	3/8"	18	12	—	6
PS-14	7/16"	20	14	10	—
PS-16	1/2"	24	16	12	8
PS-18	9/16"	28	18	14	—
PS-20	5/8"	30	20	16	10
PS-24	3/4"	36	24	18	12



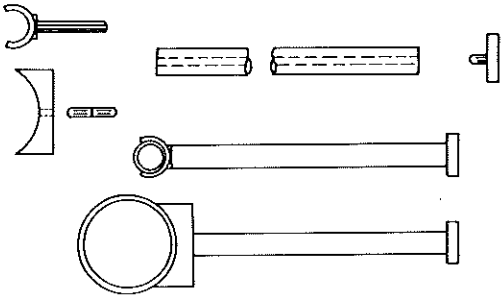
MATERIAL: ACRYLIC

✶ Colors: Valve Gray, Clear & Black.

{ Code as shown is for Valve Gray color. To order in Clear or Black, add C or BK to Code. Example: PS-2C or PS-3BK.

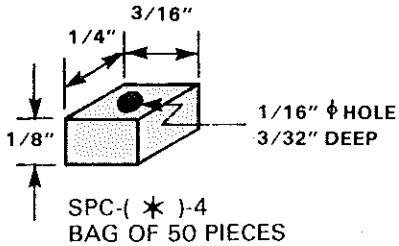
Pipe Support Clips allow support of piping from any position or material. The snap-on fit will hold the Pipe in place until cementing. The stem of the Clip can readily be cut to length for bottoming in pre-drilled holes. A spacer piece on the stem can fix elevation of bottom of Pipe. Same device can be used to support or guide vertical runs — or as pipe hangers.

SUGGESTIONS FOR FABRICATING LARGE PIPE SUPPORTS & HANGERS.

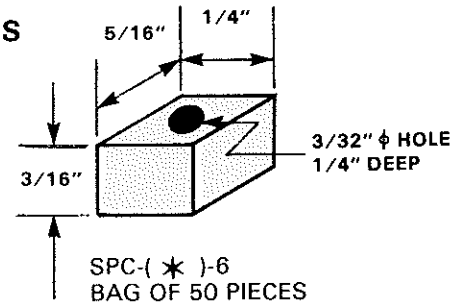


SEE FICTITIOUS SUPPORT SYSTEM & VESSEL SADDLES.

PIPE SHOES



SPC-(✶)-4
BAG OF 50 PIECES



SPC-(✶)-6
BAG OF 50 PIECES

✶ MATERIAL: ACRYLIC

COLORS: CLEAR - C
BLACK - BK
STEEL GRAY - SG

FILL IN CODE LETTER WHEN ORDERING TO DESIGNATE COLOR.

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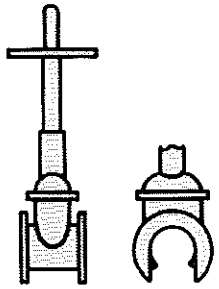
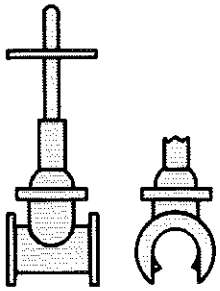
NEXT SYSTEM BEGINS ON PAGE 39.

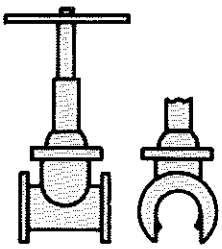
VALVE TYPES



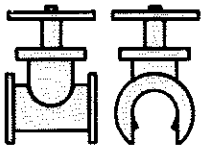
150# GATE VALVE



300# GATE VALVE

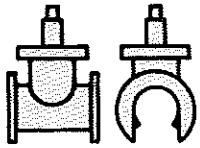


GLOBE VALVE

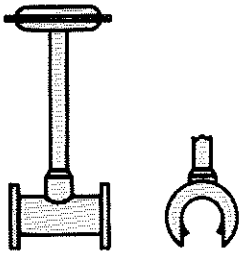


SAUNDERS—TYPE VALVE

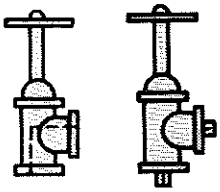
CHECK VALVE



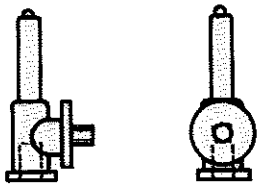
PLUG VALVE



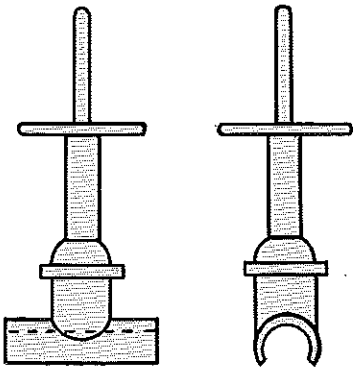
CONTROL VALVE



ANGLE VALVE



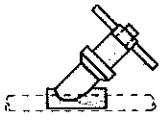
RELIEF VALVE



300# BUTT WELD
GATE VALVE

300# BUTT WELD
CHECK VALVE

BUTTERFLY
VALVE



'Y' VALVE

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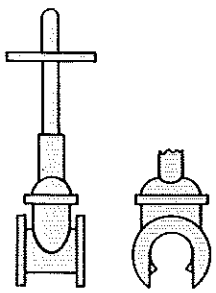
FULL SCALE VALVE SYSTEM



150 LB. GATE VALVES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
GVO-1	1/32"	1-1/2 OR 2	1 OR 1-1/2	3/4 OR 1	1/2 OR 3/4
GV-1	1/16"	2	1-1/2	1	3/4
GV-2	1/16"	3	2	1-1/2	1
GVO-2	1/16"	3	2	1-1/2	1
GV-3	3/32"	4	3	2	—
GV4-1	3/32"	—	—	—	1-1/2
GV-4	1/8"	6	4	3	—
GV4-2	1/8"	—	—	—	2
GV-6	3/16"	8 OR 10	6	4	—
GV4-3	3/16"	—	—	—	3
GV-7	1/4"	12	—	—	—
GV-8	1/4"	—	8	6	—
GV4-4	1/4"	—	—	—	4
GV-9	5/16"	14 OR 16	—	—	—
GV-10	5/16"	—	10	8	—
GV4-5	5/16"	—	—	—	5
GV-12	3/8"	18	12	—	—
GV4-6	3/8"	—	—	—	6
GV-13	7/16"	—	—	10	—
GV-14	7/16"	20	14	—	—
GV-16	1/2"	24	16	12	—
GV4-8	1/2"	—	—	—	8
GV-18	9/16"	—	18	14	—
GV-20	5/8"	—	20	16	—
GV4-10	5/8"	—	—	—	10
GV-24	3/4"	—	24	—	—
GV-25	3/4"	—	—	18	—
GV4-12	3/4"	—	—	—	12

NOTE: Select Proper Scale.
GV01-GV-1 and GV-2 are screwed fittings. All others are flanged.

Handwheels packed separately on larger Valves. All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.

✶COLOR: Code as shown is for Valve Gray Color. For Black Valves add BK to code.
Example: GV-16BK or GV4-3BK.

MATERIAL: BUTYRATE

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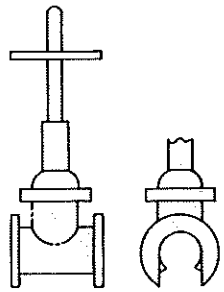
300 LB. GATE VALVES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES		
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)
GVO-1	1/32"	1-1/2 OR 2	1 OR 1-1/2	3/4 OR 1
GV-1	1/16"	2	1-1/2	1
GV-2	1/16"	3	2	1-1/2
GVO-2	1/16"	3	2	1-1/2
GV-3	3/32"	4	—	—
GV3-3	3/32"	—	3	2
GV-4	1/8"	6	—	—
GV3-4	1/8"	—	4	—
GV3-5	1/8"	—	—	3
GV-6	3/16"	8 OR 10	—	—
GV3-6	3/16"	—	6	4
GV-8	1/4"	12	—	—
GV3-8	1/4"	—	8	6
GV3-9	5/16"	14 OR 16	—	—
GV3-10	5/16"	—	10	—
GV3-11	5/16"	—	—	8
GV3-12	3/8"	18	12	—
GV3-13	7/16"	20	—	—
GV3-14	7/16"	—	14	10
GV3-15	1/2"	24	—	—
GV3-16	1/2"	—	16	12
GV3-17	9/16"	—	—	14
GV3-18	9/16"	—	18	—
GV3-20	5/8"	—	20	16
GV3-24	3/4"	—	24	18



NOTE: Select Proper Scale.
GVO-1, GV-1 and GV-2 are screwed fittings. All others are flanged.

For 3/4" Scale (1:16) 300# Valves or any other configurations see Valve Component System I and II.

Handwheels packed separately on larger Valves.

All Valves are designed to snap on to Pipe.

Cement may be applied when location is finalized.

✶ COLOR: Code as shown is for Valve Gray color.
For Black Valves add BK to code.
Example: GV3-20BK

MATERIAL: BUTYRATE

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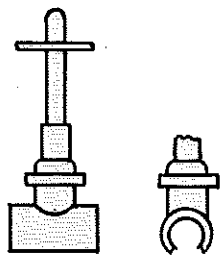
FULL SCALE VALVE SYSTEM

300# BUTT-WELDED GATE VALVES

3/8" SCALE (1:32)



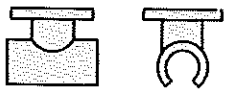
CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
GVO-1	1/32"	1 OR 1-1/2
GV-2	1/16"	2
GWV-3	3/32"	3
GWV-4	1/8"	4
GWV-6	3/16"	6
GWV-8	1/4"	8
GWV-10	5/16"	10
GWV-12	3/8"	12
GWV-14	7/16"	14
GWV-16	1/2"	16
GWV-18	9/16"	18
GWV-20	5/8"	20
GWV-24	3/4"	24

NOTE: Handwheels packed separately on larger Valves.

FOR LARGER BUTT WELD VALVES SEE VALVE SYSTEM II PAGES 59-64.

300# BUTT-WELDED CHECK VALVES

3/8" SCALE (1:32)



CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
CV-2	1/16"	2
CWV-3	3/32"	3
CWV-4	1/8"	4
CWV-6	3/16"	6
CWV-8	1/4"	8
CWV-10	5/16"	10
CWV-12	3/8"	12
CWV-14	7/16"	14
CWV-16	1/2"	16

NOTE: All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.

✶COLOR: Code as shown is for Valve Gray color. For Black Valves add BK to code. Example: GWV-8BK or CWV-10BK.

MATERIAL: BUTYRATE

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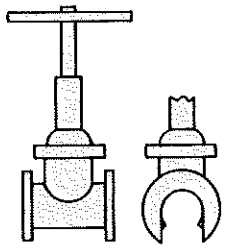
GLOBE VALVES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
GLVO-1	1/32"	1-1/2	1 OR 1-1/2	—	—
GLV-1	1/16"	2	—	—	—
GLV-2	1/16"	3	2	—	—
GLV-4	3/32"	—	3	2	—
GLV-5	1/8"	—	4	—	—
GLV-6	1/8"	—	—	3	2
GLV-7	3/16"	—	6	4	—
GLV-9	3/16"	—	—	—	3
GLV-10	1/4"	—	8	—	—
GLV-11	1/4"	—	—	6	—
GLV-12	1/4"	—	—	—	4
GLV-13	5/16"	—	—	8	—
GLV-14	5/16"	—	—	—	5
GLV-15	3/8"	—	—	—	6
GLV-16	1/2"	—	—	—	8
GLV-23	3/32"	4	—	—	—
GLV-25	1/8"	6	—	—	—
GLV-26	3/16"	8	—	—	—



NOTE: Select Proper Scale.
GLVO-1, GLV-1 and GLV-2 are screwed fittings. All others are flanged.

Handwheels packed separately on larger Valves. Clip stem after installing Handwheel.

All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.

✶COLOR: Code as shown is for Valve Gray color.
For Black Valves add BK to code. Example GLV-5BK.

MATERIAL: BUTYRATE

See Valve Component Systems I and II
for other sizes and configurations.

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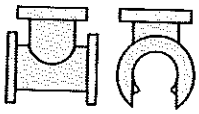
FULL SCALE VALVE SYSTEM



CHECK VALVES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
CV-2	1/16"	2 OR 3	1-1/2 OR 2	1-1/2	3/4 OR 1
CV-3	3/32"	—	3	2	1-1/2
CV-4	1/8"	—	4	3	2
CV-5	3/32"	4	—	—	—
CV-6	3/16"	8 OR 10	6	4	3
CV-7	1/8"	6	—	—	—
CV-8	1/4"	12	8	6	4
CV-10	5/16"	—	10	8	5
CV-12	3/8"	—	12	—	6
CV-14	7/16"	—	—	10	—
CV-16	1/2"	—	—	12	8

NOTE: Select Proper Scale.
CV-2 is screwed fitting. All others are flanged.

For CV-1, order GVO-1 (Page 40) and clip stem above bonnet.

All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.

✶ COLOR: Code as shown is for Valve Gray color.
For Black Valves add BK to code.
Example: CV-3BK.

MATERIAL: BUTYRATE

See Page 42 for 3/8" Scale 300# Butt-Welded Check Valves.

See Valve Component Systems I and II for other sizes and configurations.

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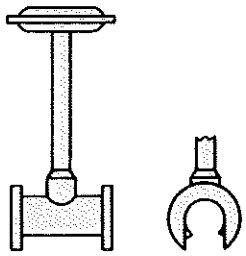
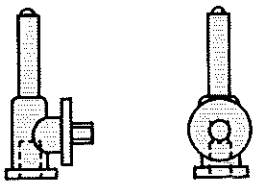
CONTROL VALVES

CODE ✳	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
MV-1	1/32"	1-1/2 OR 2	1 OR 1-1/2	1	1/2 OR 3/4
MV-2	1/16"	2 OR 3	1-1/2 OR 2	1-1/2	3/4 OR 1
MV-3	3/32"	—	3	—	—
MV-4	1/8"	—	4	—	—
MV-5	3/32"	—	—	2	—
MV-6	3/16"	—	6	—	—
MV-7	1/8"	—	—	3	—
MV-8	1/4"	—	8	6	—
MV-9	3/32"	4	—	—	—
MV-10	1/8"	6	—	—	—
MV-11	3/16"	8	—	—	—
MV-12	3/16"	—	—	4	—
MV-13	3/32"	—	—	—	1-1/2
MV-14	1/8"	—	—	—	2



NOTE: Select Proper Scale.
MV-1 and MV-2 are screwed fittings. All others are flanged.
All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.
✳ COLORS: Valve Gray, Pink and Black.
Code as shown is for Valve Gray color. To order in Pink or Black add P or BK to code.
Example: MV-6P or RV-8BK.
Pink is the color designated for Instrumentation.
MATERIAL: BUTYRATE



RELIEF VALVES

CODE ✳	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
RV-1	1/32" x 1/32"	1 x 2	3/4 x 1-1/2	1/2 x 1	1/2 x 3/4
RV-2	1/16" x 3/32"	3 x 4	1-1/2 OR 2 x 3	1-1/2 x 2	1 x 1-1/2
RV-3	1/16" x 1/8"	3 x 6	2 x 4	1-1/2 x 3	1 x 2
RV-4	3/32" x 1/8"	4 x 6	3 x 4	2 x 3	1-1/2 x 2
RV-6	1/8" x 3/16"	6 x 8 OR 10	4 x 6	3 x 4	2 x 3
RV-8	3/16" x 1/4"	8 OR 10 x 12	6 x 8	4 x 6	3 x 4

MATERIAL: BUTYRATE

✳ See Color Note above.

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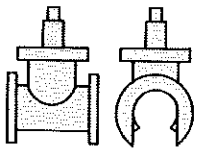
FULL SCALE VALVE SYSTEM

PLUG VALVES



CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
PV-2	1/16"	2 OR 3	1-1/2 OR 2	1-1/2	1
PV-3	3/32"	—	3	2	1-1/2
PV-4	1/8"	—	4	3	2
PV-5	3/32"	4	—	—	—
PV-6	3/16	—	—	4	3
PV-8	1/4"	—	—	—	4

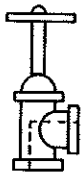
NOTE: For PV-1 order GVO-1 (page 40) and clip off handwheel. Select Proper Scale.

Pipe Supports may be used to indicate Wrenches
All Valves are designed to snap on to pipe.
Cement may be applied when location is finalized.

✶ COLOR: Code as shown is for Valve Graycolor. For Black Valves add BK to Code. Example: PV-2BK.

MATERIAL: BUTYRATE

AV-2



AV-3 & 4

AV-6 & 8

ANGLE VALVES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
AV-2	1/16"	3	2	1-1/2	1
AV-3	3/32"	4	3	2	1-1/2
AV-4	1/8"	6	4	3	2
AV-6	3/16"	8 OR 10	6	4	3
AV-8	1/4"	12	8	6	4

All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.

✶ COLORS: Valve Gray, Pink and Black.

Code as shown is for Valve Gray color. To order in Pink or Black add P or BK to code.
Example: AV-6P or AV-8BK.

Pink is the color designated for Instrumentation.

MATERIAL: BUTYRATE

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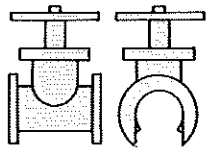
SAUNDERS TYPE VALVES
(DIAPHRAM VALVES)

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
SV-2	1/16"	2 OR 3	2	1-1/2	3/4 OR 1
SV-3	3/32"	4	3	2	1-1/2
SV-4	1/8"	6	4	3	2
SV-6	3/16"	8 OR 10	6	—	—
SV-7	3/16"	—	—	4	3
SV-8	1/4"	12	8	—	—
SV-9	1/4"	—	—	6	—
SV-10	5/16"	—	10	—	—
SV-11	5/16"	14	—	8	—
SV-12	3/8"	—	12	—	—
SV-14	7/16"	—	14	—	—
SV-15	7/16"	—	—	10	—
SV-16	1/4"	—	—	—	4
SV-17	5/16"	—	—	—	5
SV-18	1/2"	—	—	12	6



NOTE: Select Proper Scale.

Handwheels packed separately.

All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.

✶COLOR: Code as shown is for Valve Gray color.
For Black Valves add BK to code.
Example: SV-2BK.

MATERIAL: BUTYRATE

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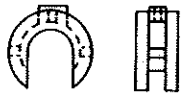
FULL SCALE VALVE SYSTEM



BUTTERFLY VALVES

CODE ✶	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
GBV-2	1/16"	3	2	1-1/2	1
GBV-3	3/32"	4	3	2	1-1/2
GBV-4	1/8"	6	4	3	2
GBV-6	3/16"	8 OR 10	6	4	3
GBV-8	1/4"	12	8	6	4
GBV-10	5/16"	14 OR 16	10	8	5
GBV-12	3/8"	18	12	—	6
GBV-14	7/16"	20	14	10	—
GBV-16	1/2"	24	16	12	8
GBV-18	9/16"	28	18	14	—
GBV-20	5/8"	30	20	16	10
GBV-24	3/4"	36	24	18	12
GBV-28	7/8"	42	28	20 OR 22	14
GBV-32	1"	48	32	24	16
GBV-36	1-1/8"	54	36	26 OR 28	18
GBV-40	1-1/4"	60	40	30	20

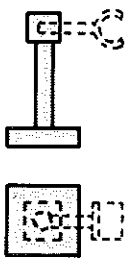
NOTE: Select Proper Scale.

All Valves are designed to snap on to Pipe. Cement may be applied when location is finalized.

Pads are provided at 90° spacing to allow attachments for manual or power operators.

✶ **COLOR:** Code as shown is for Valve Gray color. To order in Pink or Black add 'P' or 'BK' to end of code.
EXAMPLE: GBV-8P or GBV-6BK.

MATERIAL: BUTYRATE



LIQUID LEVEL CONTROLLERS

CODE	SCALE
LL-8	1/4" = 1'-0" (1:48)
LL-12	3/8" = 1'-0" (1:32)
LL-16	1/2" = 1'-0" (1:24)
LL-24	3/4" = 1'-0" (1:16)

Attach to Pipe with Pipe Support Clips described on page 19 (two required on LL-24). Cut off stems of Clips to desired length.

COLORS: Valve Gray and Pink.
Code as shown is for Valve Gray color. To order in Pink, add P to code. Example: LL-8P. Pink is the color designated for Instrumentation.

MATERIAL: BUTYRATE

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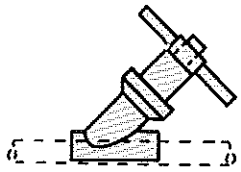
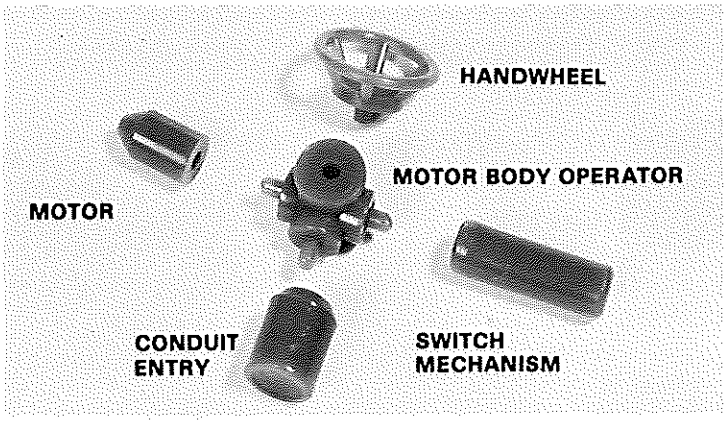


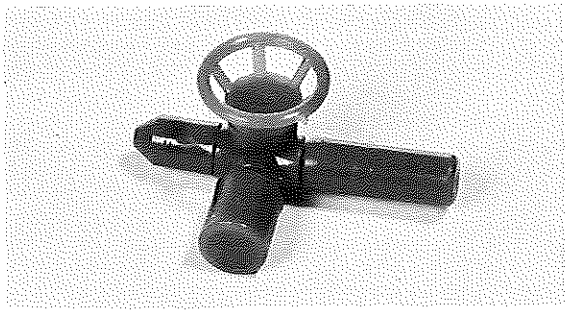
2" Y VALVE (GLOBE OR CHECK)

CODE	SCALE
GVY-2	3/8" = 1' - 0" (1:32)
GVY-3	1/2" = 1' - 0" (1:24)

COLOR: Code as shown is for Valve Gray color.
For Black add 'Bk' to Code.
EXAMPLE: GVY-2BK
MATERIAL: BUTYRATE

MOTOR OPERATOR SET



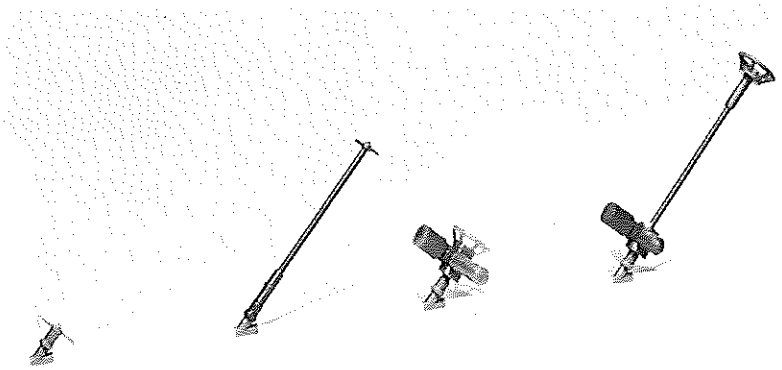


5 PIECE SET

CODE	SCALE
MOS-12	3/8" = 1' - 0" (1:32)
MOS-16	1/2" = 1' - 0" (1:24)

COLOR: Electrical Green
MATERIAL: BUTYRATE

TYPICAL APPLICATIONS



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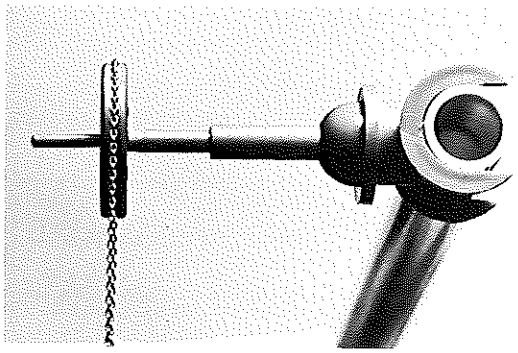
CHAIN



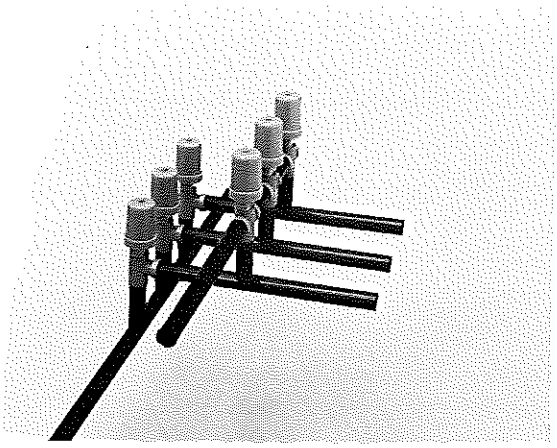
BRASS CHAIN (3' LENGTH)

CODE
CHN-2

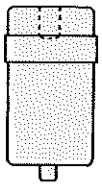
20 links per inch.

CHERRY-BURRELL SANITARY AUTOMATIC VALVES

3/4" = 1'-0" SCALE (1:16)
DESIGNED FOR 3 INCH PIPE

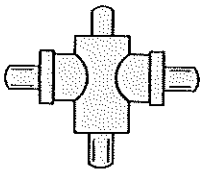


COLOR: Valve Gray
MATERIAL: BUTYRATE



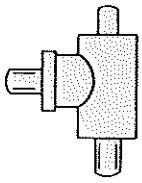
VALVE ACTUATOR

CODE: CBA-61



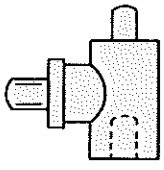
3-WAY CROSS VALVE

CODE: BODY-61C



SINGLE BODY T-VALVE

CODE: BODY-61T



SINGLE BODY T-VALVE
TO WORK WITH BODY-61T

CODE: BODY-62TT

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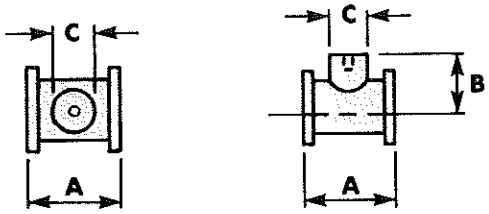
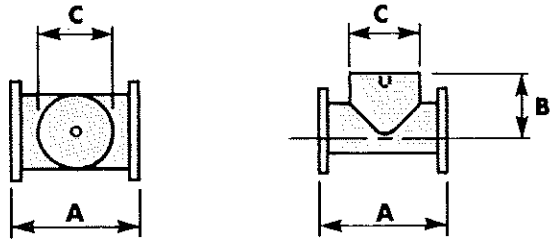


VALVE BODIES

CODE	PIPE SIZE	ACTUAL DIMENSIONS		
		A	B	C dia.
BODY-A	3/32"	1/4"	5/32"	7/64"
BODY-C	1/8"	5/16"	3/16"	9/64"
BODY-E	3/16"	11/32"	7/32"	5/32"
BODY-G	1/4"	7/16"	9/32"	3/16"

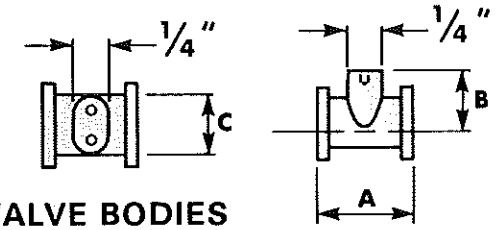


VALVE BODIES

CODE	PIPE SIZE	ACTUAL DIMENSIONS		
		A	B	C dia.
✶ BODY-B	3/32"	3/8"	5/32"	9/64"
✶ BODY-D	1/8"	7/16"	3/16"	3/16"
✶ BODY-F	3/16"	1/2"	7/32"	3/16"
✶ BODY-H	1/4"	9/16"	9/32"	1/4"
BODY-K	5/16"	5/8"	11/32"	5/16"
BODY-M	3/8"	21/32"	3/8"	3/8"
BODY-P	7/16"	13/16"	7/16"	1/2"
BODY-R	1/2"	15/16"	1/2"	9/16"
BODY-T	9/16"	1"	17/32"	5/8"
BODY-V	5/8"	1-1/16"	5/8"	5/8"
BODY-X	3/4"	1-5/16"	5/8"	3/4"

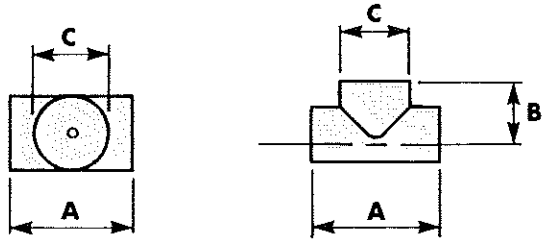
DISCS (VALVE HANDWHEELS)

CODE	ACTUAL O.D.	ACTUAL I.D.
D-8	1/4"	3/32"
D-12	3/8"	3/32"
D-16	1/2"	3/32"
D-20	5/8"	3/32"
D-24	3/4"	3/32"
D-28	7/8"	3/32"
D-32	1"	3/32"
D-36	1-1/8"	3/32"



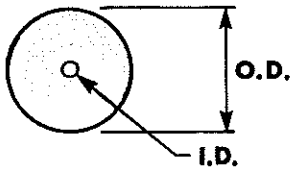
VALVE BODIES

CODE	PIPE SIZE	ACTUAL DIMENSIONS		
		A	B	C dia.
BODY-J	5/16"	7/16"	11/32"	3/8"
BODY-L	3/8"	7/16"	3/8"	7/16"
BODY-N	7/16"	7/16"	7/16"	1/2"
BODY-Q	1/2"	21/32"	1/2"	9/16"
BODY-S	9/16"	11/16"	17/32"	5/8"
BODY-U	5/8"	11/16"	5/8"	11/16"
BODY-W	3/4"	3/4"	5/8"	13/16"



VALVE BODIES

CODE	PIPE SIZE	ACTUAL DIMENSIONS		
		A	B	C dia.
BODY-BB	3/32"	11/32"	5/32"	9/64"
BODY-DD	1/8"	3/8"	3/16"	3/16"
BODY-FF	3/16"	31/64"	7/32"	3/16"
BODY-HH	1/4"	17/32"	9/32"	1/4"
BODY-KK	5/16"	9/16"	11/32"	5/16"
BODY-MM	3/8"	39/64"	3/8"	3/8"
BODY-PP	7/16"	15/16"	7/16"	1/2"
BODY-RR	1/2"	1-1/32"	1/2"	9/16"
BODY-TT	9/16"	1-1/8"	17/32"	5/8"
BODY-VV	5/8"	1-7/32"	5/8"	5/8"
BODY-XX	3/4"	1-13/32"	11/16"	3/4"



COLOR: Valve Gray & Black
Code shown is for Valve Gray color. To order in Black add 'BK' to end of code. EXAMPLE: BODY-P-BK

✶ Also available in Pink. Add 'P' to end of code. EXAMPLE: BODY-D-P

MATERIAL: BUTYRATE

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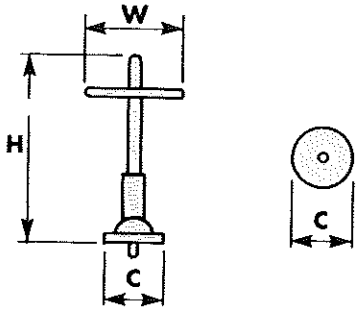
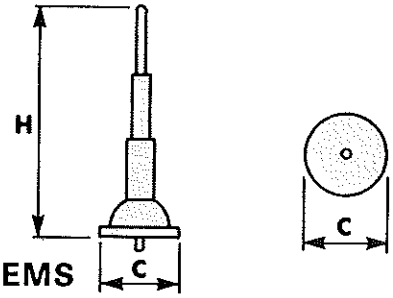
VALVE COMPONENT SYSTEM I



VALVE STEMS

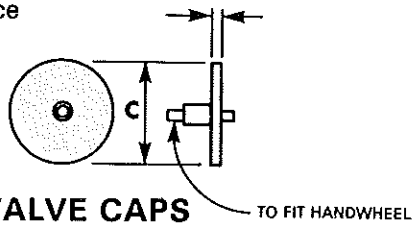
CODE	ACTUAL DIMENSIONS		
	C	H	W
STEM-4	7/32"	15/32"	9/32"
STEM-5	9/32"	9/16"	11/32"
STEM-6	5/16"	29/32"	7/16"
STEM-7	3/8"	1-1/8"	15/32"



VALVE STEMS

CODE	ACTUAL DIMENSIONS	
	C	H
STEM-21	7/16"	1-1/4"
STEM-22	1/2"	1-15/32"
STEM-23	17/32"	1-21/32"
STEM-24	11/16"	1-29/32"
STEM-25	3/4"	2-1/16"
✶ STEM-27	7/8"	2-1/2"
✶ STEM-28	1"	3"

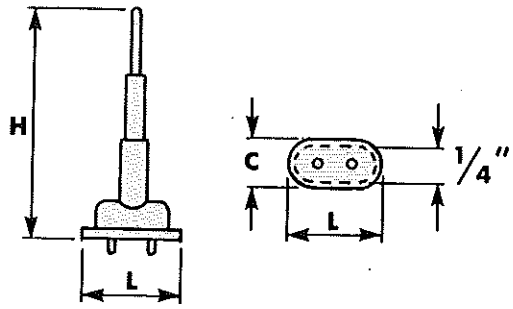
✶ Two piece



PLUG VALVE CAPS

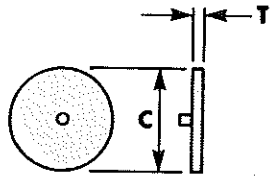
CODE	ACTUAL DIMENSIONS	
	T	C
CAP-141	1/16"	1/4"
CAP-142	5/64"	3/8"
CAP-143	3/32"	1/2"
CAP-144	3/32"	11/16"

COLOR: Valve Gray & Black
Code shown is for Valve Gray color. To order in Black add 'BK' to end of code.
EXAMPLE: STEM-7BK



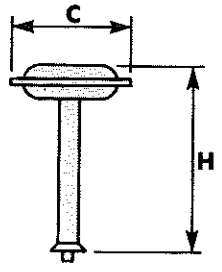
VALVE STEMS

CODE	ACTUAL DIMENSIONS		
	L	H	C
STEM-8	1/2"	1-11/32"	3/8"
STEM-9	9/16"	1-15/32"	3/8"
STEM-10	5/8"	1-23/32"	3/8"
STEM-11	11/16"	2-1/32"	3/8"
STEM-12	13/16"	2-3/16"	7/16"
STEM-13	7/8"	2-7/16"	7/16"
STEM-14	1"	2-29/32"	7/16"



CHECK VALVE CAPS

CODE	ACTUAL DIMENSIONS	
	T	C
CAP-41	1/16"	1/4"
CAP-42	5/64"	3/8"
CAP-43	3/32"	1/2"
CAP-44	3/32"	11/16"



CONTROL VALVE DIAPHRAMS

CODE	ACTUAL DIMENSIONS	
	C	H
CVD-61	5/16"	7/16"
CVD-62	7/16"	23/32"
CVD-63	9/16"	7/8"
CVD-64	5/8"	31/32"

Control Valve Diaphrams also available in Pink.
Add 'P' to end of code.
EXAMPLE: CVD-62P
MATERIAL: BUTYRATE

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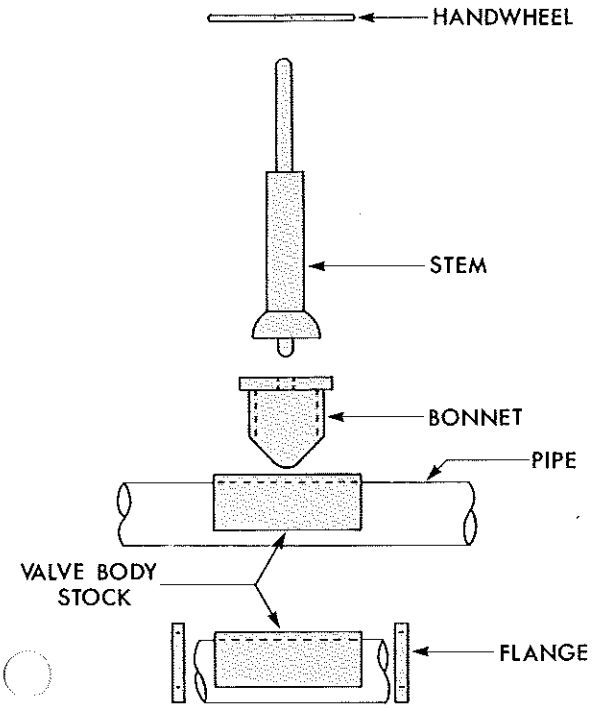
VALVE COMPONENT SYSTEM II

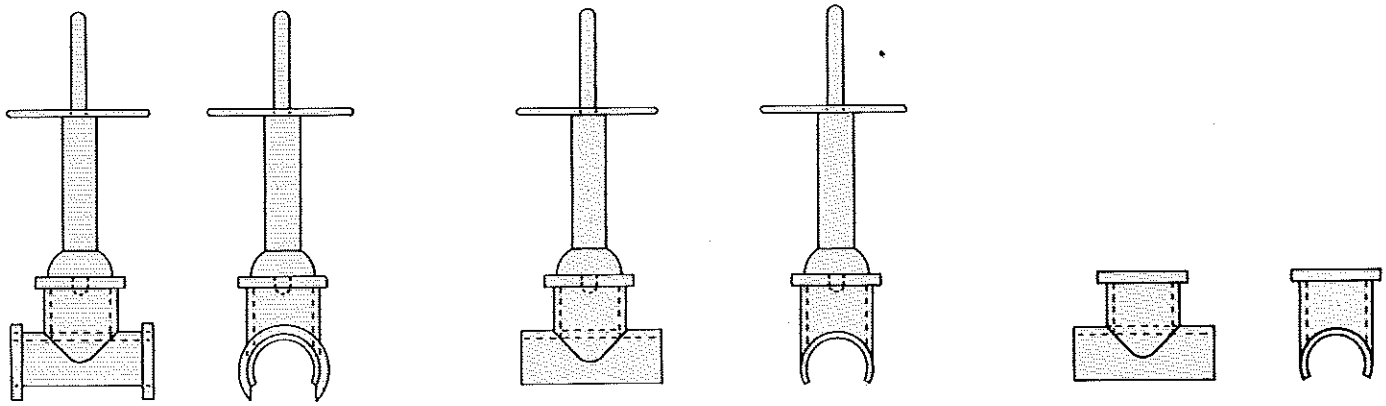


This system is primarily designed to provide the components for assembling large size and high pressure valves in 1/2" = 1'-0" (1:24) & 3/4" = 1'-0" (1:16) scales. All components are Precision Extruded and Injection Molded of Butyrate plastic to provide the characteristics and compatability consistent with EMA's high standards.

With these and the components shown on previous pages it is possible to assemble a vast range of the most commonly used Gate, Globe, Check and Control Valves. Butt-Welded or Flanged Valves are equally easy to assemble. And the range will be expanded as your requirements dictate.

COLOR: Valve Gray

See pages 60-62 for the listing of pre-asembled valves.



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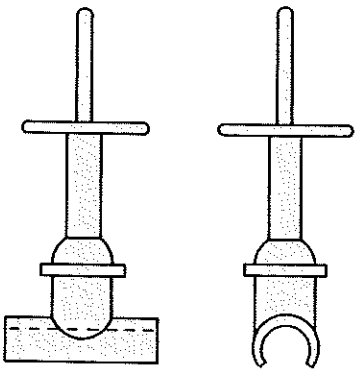
VALVE COMPONENT SYSTEM II



BUTT-WELDED GATE VALVES

1/2" SCALE (1:24)

300#

CODE	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
GWV-2	1/16"	1-1/2
GWV-3	3/32"	2
GWV-4	1/8"	3
GWV-6	3/16"	4
GWV316-6	1/4"	6
GWV316-8	5/16"	8
GWV316-10	7/16"	10
GWV316-12	1/2"	12
GWV316-14	9/16"	14
GWV316-16	5/8"	16
GWV316-18	3/4"	18
GWV316-20	7/8"	20
GWV316-24	1"	24
GWV316-30	1-1/4"	30

600#

CODE	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
GWV-2	1/16"	1-1/2
GWV-3	3/32"	2
GWV616-3	1/8"	3
GWV616-4	3/16"	4
GWV616-6	1/4"	6
GWV616-8	5/16"	8
GWV616-10	7/16"	10
GWV616-12	1/2"	12
GWV616-14	9/16"	14
GWV616-16	5/8"	16
GWV616-18	3/4"	18
GWV616-20	7/8"	20
GWV616-24	1"	24

900#

CODE	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
GWV916-3	1/8"	3
GWV916-4	3/16"	4
GWV916-6	1/4"	6
GWV916-8	5/16"	8
GWV916-10	7/16"	10
GWV916-12	1/2"	12
GWV916-14	9/16"	14
GWV916-16	5/8"	16

All Valves are designed to snap on to Pipe.
Cement may be applied when location is finalized.

COLOR: Valve Gray

MATERIAL: BUTYRATE

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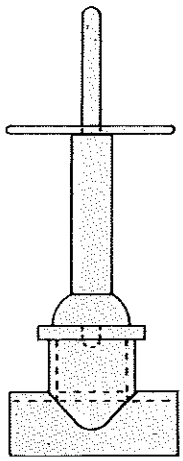
BUTT-WELDED GATE VALVES

3/4" SCALE (1:16)



300#

CODE	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
GWV-2	1/16"	1
GWV324-2	1/8"	2
GWV324-3	3/16"	3
GWV324-4	1/4"	4
GWV324-6	3/8"	6
GWV324-8	1/2"	8
GWV324-10	5/8"	10
GWV324-12	3/4"	12
GWV324-14	7/8"	14
GWV324-16	1"	16
GWV324-18	1-1/8"	18
GWV324-20	1-1/4"	20

600#

CODE	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
GWV-2	1/16"	1
GWV624-2	1/8"	2
GWV624-3	3/16"	3
GWV624-4	1/4"	4
GWV624-6	3/8"	6
GWV624-8	1/2"	8
GWV624-10	5/8"	10
GWV624-12	3/4"	12
GWV624-14	7/8"	14
GWV624-16	1"	16
GWV624-18	1-1/8"	18
GWV624-20	1-1/4"	20

900#

CODE	TO FIT ACTUAL PIPE SIZE	SCALE SIZE IN INCHES
GWV924-3	3/16"	3
GWV924-4	1/4"	4
GWV924-6	3/8"	6
GWV924-8	1/2"	8
GWV924-10	5/8"	10
GWV924-12	3/4"	12
GWV924-14	7/8"	14
GWV924-16	1"	16

All Valves are designed to snap on to Pipe.
Cement may be applied when location is finalized.

COLOR: Valve Gray

MATERIAL: BUTYRATE

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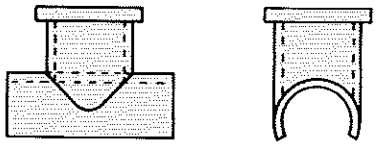
BUTT-WELDED CHECK VALVES



300#

1/2" SCALE (1:24)

CODE	ACTUAL SIZE	SCALE SIZE IN INCHES
CWV316-2	3/32"	2
CWV316-3	1/8"	3
CWV316-4	3/16"	4
CWV316-6	1/4"	6
CWV316-8	5/16"	8
CWV316-10	7/16"	10
CWV316-12	1/2"	12
CWV316-14	9/16"	14
CWV316-16	5/8"	16

3/4" SCALE (1:16)

CODE	ACTUAL SIZE	SCALE SIZE IN INCHES
CWV324-2	1/8"	2
CWV324-3	3/16"	3
CWV324-4	1/4"	4
CWV324-6	3/8"	6
CWV324-8	1/2"	8
CWV324-10	5/8"	10
CWV324-12	3/4"	12
CWV324-14	7/8"	14
CWV324-16	1"	16

600#

1/2" SCALE (1:24)

CODE	ACTUAL SIZE	SCALE SIZE IN INCHES
CWV616-2	3/32"	2
CWV616-3	1/8"	3
CWV616-4	3/16"	4
CWV616-6	1/4"	6
CWV616-8	5/16"	8
CWV616-10	7/16"	10
CWV616-12	1/2"	12

3/4" SCALE (1:16)

CODE	ACTUAL SIZE	SCALE SIZE IN INCHES
CWV624-2	1/8"	2
CWV624-3	3/16"	3
CWV624-4	1/4"	4
CWV624-6	3/8"	6
CWV624-8	1/2"	8
CWV624-10	5/8"	10
CWV624-12	3/4"	12

NOTE: Select Proper Scale.
All Valves are designed to snap on to Pipe.
Cement may be applied when location is finalized.

COLOR: Valve Gray

MATERIAL: BUTYRATE

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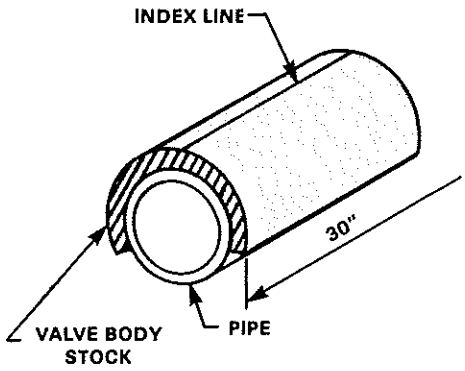
VALVE BODY STOCK

CODE	TO FIT ACTUAL PIPE SIZE	WALL THICKNESS
VBS-3	3/32"	.047
VBS-4	1/8"	.062
VBS-6	3/16"	.062
VBS-8	1/4"	.062
VBS-10	5/16"	.062
VBS-12	3/8"	.062
VBS-14	7/16"	.062
VBS-16	1/2"	.062
VBS-18	9/16"	.062
VBS-20	5/8"	.062
VBS-24	3/4"	.062
VBS-28	7/8"	.062
VBS-32	1"	.062
VBS-36	1-1/8"	.062
VBS-40	1-1/4"	.062



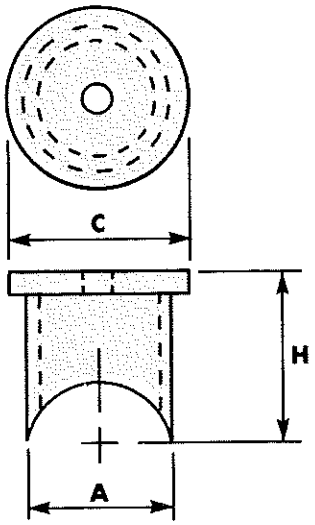
COLOR: Valve Gray

ACCURATELY EXTRUDED 30" LONG
MATERIAL: Butyrate

Valve Body Stock is provided in 30" lengths which can be cut to required Valve Body length. It is designed to snap on to Pipe after assembly. An index line is provided for properly locating vertical centerline to correspond with Bonnet.

VALVE BONNETS

CODE	TO FIT VALVE BODY STOCK	ACTUAL DIMENSIONS		
		A	C	H
GVT-3	VBS-3	3/16"	5/16"	5/16"
GVT-4	VBS-4	1/4"	3/8"	11/32"
GVT-6	VBS-6	5/16"	7/16"	13/32"
GVT-8	VBS-8	3/8"	1/2"	1/2"
GVT-10	VBS-10	7/16"	5/8"	19/32"
GVT-12	VBS-12	1/2"	11/16"	19/32"
GVT-14	VBS-14	9/16"	3/4"	21/32"
GVT-16	VBS-16	5/8"	13/16"	25/32"
GVT-18	VBS-18	11/16"	7/8"	27/32"
GVT-20	VBS-20	3/4"	15/16"	29/32"
GVT-24	VBS-24	7/8"	1-1/8"	1-3/32"
GVT-28	VBS-28	1"	1-1/4"	1-1/4"
GVT-32	VBS-32	1-1/8"	1-3/8"	1-13/32"
GVT-36	VBS-36	1-1/4"	1-1/2"	1-9/16"
GVT-40	VBS-40	1-3/8"	1-5/8"	1-11/16"



COLOR: Valve Gray

PRECISION INJECTION MOLDED

MATERIAL: BUTYRATE

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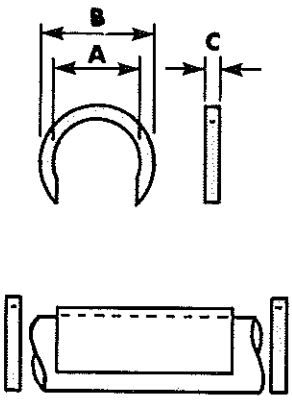
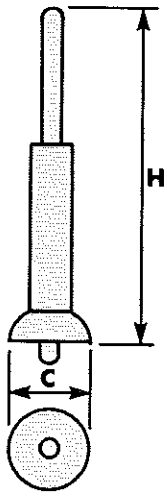
VALVE COMPONENT SYSTEM II



PRECISION INJECTION MOLDED
COLOR: Valve Gray
MATERIAL: BUTYRATE

VALVE FLANGES

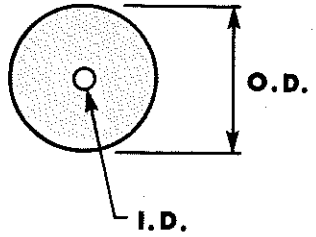
CODE	TO FIT VALVE BODY STK.	ACTUAL DIMENSIONS		
		A	B	C
GFL-3	VBS-3	3/16"	5/16"	1/16"
GFL-4	VBS-4	1/4"	3/8"	1/16"
GFL-6	VBS-6	5/16"	29/64"	5/64"
GFL-8	VBS-8	3/8"	39/64"	3/32"
GFL-10	VBS-10	7/16"	11/16"	3/32"
GFL-12	VBS-12	1/2"	3/4"	3/32"
GFL-14	VBS-14	9/16"	27/32"	1/8"
GFL-16	VBS-16	5/8"	59/64"	1/8"
GFL-18	VBS-18	11/16"	15/16"	1/8"
GFL-20	VBS-20	3/4"	1-1/32"	1/8"
GFL-24	VBS-24	7/8"	1-7/32"	5/32"
GFL-28	VBS-28	1"	1-11/32"	5/32"
GFL-32	VBS-32	1-1/8"	1-17/32"	11/64"
GLF-36	VBS-36	1-1/4"	1-21/32"	11/64"
GFL-40	VBS-40	1-3/8"	1-13/16"	11/64"



VALVE STEMS

CODE	ACTUAL DIMENSIONS	
	C	H
STEM-30	1/4"	7/8"
STEM-33	11/32"	1-3/8"
STEM-36	15/32"	2-5/16"
STEM-39	21/32"	2-25/32"
STEM-42	15/16"	3-3/4"
STEM-45	1-1/8"	5-5/32"

PRECISION INJECTION MOLDED
COLOR: Valve Gray
MATERIAL: BUTYRATE



DISCS (VALVE HANDWHEELS)

CODE	ACTUAL O.D.	ACTUAL I.D.
D-8	1/4"	3/32"
D-12	3/8"	3/32"
D-16	1/2"	3/32"
D-20	5/8"	3/32"
D-24	3/4"	3/32"
D-28	7/8"	3/32"
D-32	1"	3/32"
D-36	1-1/8"	3/32"
D-39	1-1/4"	3/32"
D-40	1-1/4"	3/16"
D-48	1-1/2"	3/16"
D-56	1-3/4"	3/16"
D-60	1-7/8"	3/16"
D-72	2-1/4"	3/16"
D-84	2-5/8"	3/16"

COLOR: Valve Gray
Discs also available in Black & Pink.
See page 16.
MATERIAL: BUTYRATE

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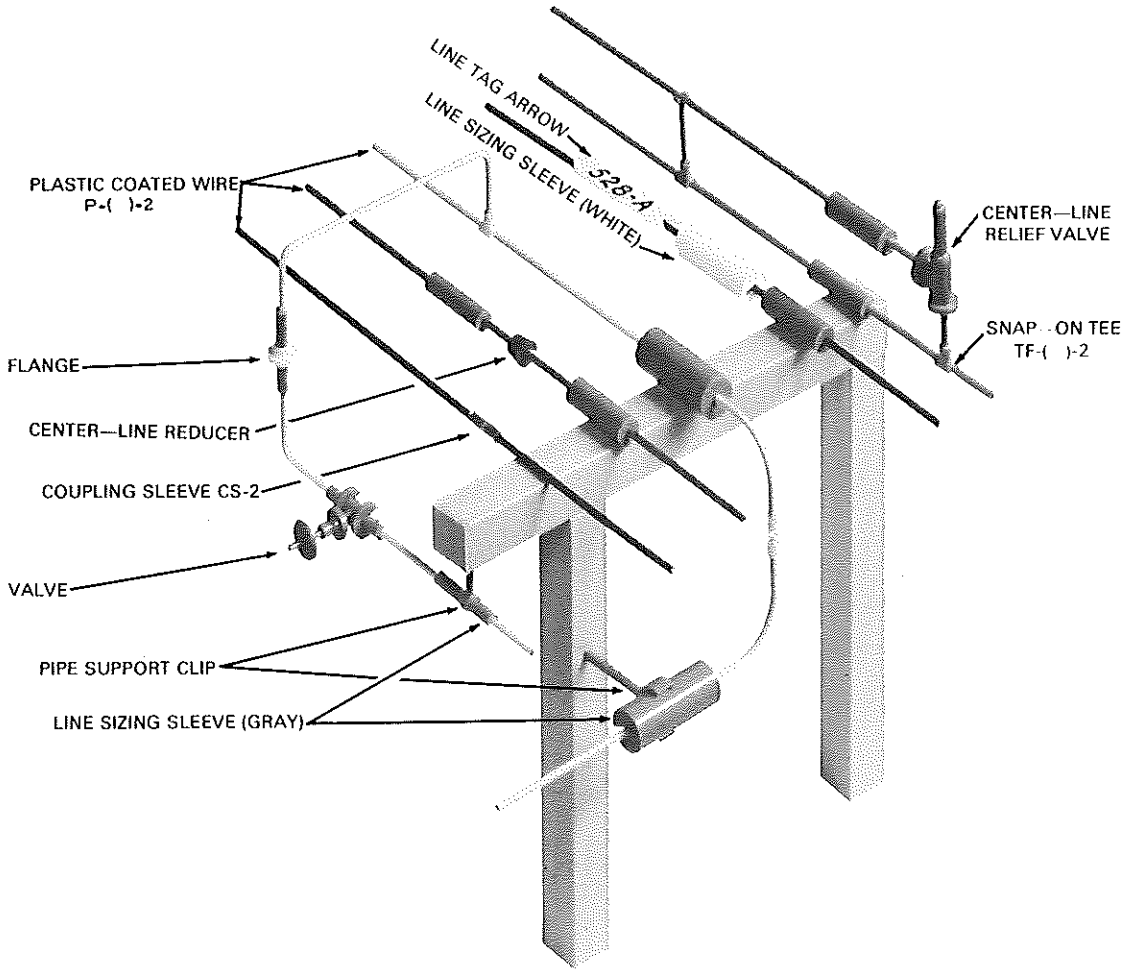
CENTER-LINE PIPING SYSTEM



With this System, a pipe, regardless of its actual diameter, is represented by 1/16" diameter plastic coated wire which indicates its center line. Plastic Line Sizing Sleeves are used to indicate the actual and insulated diameters of pipe and to allow the use of Full Scale Piping System components such as valves and flanges. Thus, separate inventories of components are eliminated.

FEATURES

1. All materials are Butyrate Plastic. This permits not only the use of the Full Scale components, but the freedom to indicate special lines or piping conditions in Full Scale. The systems can be combined.
2. The system is designed for snap-fit connections and bonds perfectly using E.M.A. Plastic Piping Cement.
3. The light weight of the materials, plus the fine cementing qualities, allows firm construction and simplifies handling and shipping.
4. The 1/16" plastic coated wire is easily bent by hand.
5. Gray Line Sizing Sleeves, same color as valves, are used not only to indicate the actual pipe size, but to serve as adapters for the Full Scale components. Sizing Sleeves in White are provided to show insulated diameters of pipe.
6. True center-line elevations of piping on pipeways are easily achieved using the Sizing Sleeves, and Pipe Guides and Supports are simply represented.
7. This system is ideal where the Photo-Drawing technique is used. The color selection allows for differentiation, and the problem of lines being hidden behind other larger lines is eliminated.
8. Center-Line Piping can be easily and quickly replaced on the model by Full Scale Piping, and with a very small loss of material. The process of installing the Full Scale Piping provides a final check and results in the valuable "finished model."

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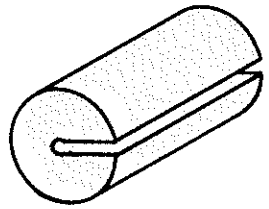
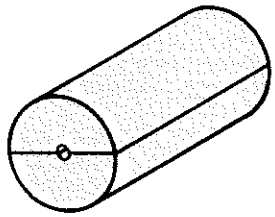
CENTER-LINE SIZING SLEEVES



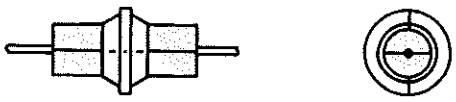
CODE ✶	OUTSIDE DIAMETER	LENGTH
LAS - ( ) -3	3/32"	5/8"
LAS - ( ) -4	1/8"	3/4"
LAS - ( ) -6	3/16"	3/4"
LAS - ( ) -8	1/4"	3/4"
LAS - ( ) -10	5/16"	15/16"
LAS - ( ) -12	3/8"	15/16"

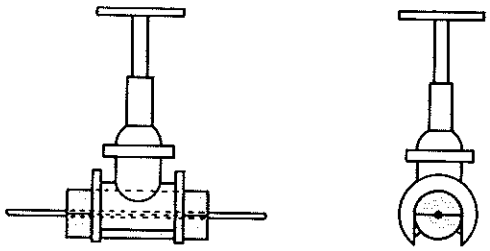
LAS ,sizes 3 thru 12, are one piece,slotted.
Minimum order one bag of 50 pieces.
Each color must be a seperate quantity order.



CODE ✶	OUTSIDE DIAMETER	LENGTH
LAS - ( ) -14	7/16"	1-1/16"
LAS - ( ) -16	1/2"	1-1/16"
LAS - ( ) -18	9/16"	1-1/4"
LAS - ( ) -20	5/8"	1-1/4"
LAS - ( ) -24	3/4"	1-1/2"

LAS, sizes 14 and over consist of two pieces which snap together around P - ( ) -2. The two pieces constitute one unit.





✶ Fill in code letter when ordering to designate color:

VG - Gray to indicate actual line size.
W - White to indicate insulated line size.

MATERIAL: BUTYRATE

All line sizing sleeves work with 1/16" Dia. pipe. See P - ( ) -2 Page no. 6

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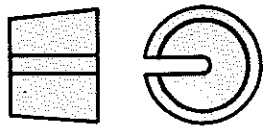
CENTER-LINE REDUCERS

CODE ✱	ACTUAL SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
CR-( )- 3	1/8" x 3/32"	6 x 4	4 x 3	3 x 2	2 x 1½
CR-( )- 4	3/16" x 1/8"	8 or 10 x 6	6 x 4	4 x 3	3 x 2
CR-( )- 6	1/4" x 3/16"	12 x 8 or 10	8 x 6	6 x 4	4 x 3
CR-( )- 8	5/16" x 1/4"	14 or 16x12	10 x 8	8 x 6	5 x 4
CR-( )-10	3/8" x 5/16"	18 x 14 or 16	12 x 10	—	6 x 5
CR-( )-12	7/16" x 3/8"	20 x 18	14 x 12	—	—
CR-( )-14	1/2" x 7/16"	24 x 20	16 x 14	12 x 10	—
CR-( )-16	9/16" x 1/2"	28 x 24	18 x 16	14 x 12	—
CR-( )-17	5/8" x 1/2"	30 x 24	20 x 16	16 x 12	10 x 8
CR-( )-18	5/8" x 9/16"	30 x 28	20 x 18	16 x 14	—
CR-( )-20	3/4" x 5/8"	36 x 20	24 x 20	18 x 16	12 x 10



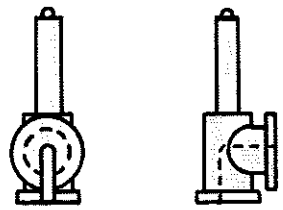
✱

SIZE	EMA COLORS														
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
3 - 20	X	X	X	X	X	X	X									
SEE PAGE 2 FOR COLOR CHART																

MATERIAL: BUTYRATE

CENTER-LINE RELIEF VALVES

CODE ✱	ACTUAL SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
CRV-2	1/16" x 3/32"	3 x 4	1-1/2 OR 2 x 3	1½ x 2	1 x 1½
CRV-3	1/16" x 1/8"	3 x 6	2 x 4	1½ x 3	1 x 2
CRV-4	3/32" x 1/8"	4 x 6	3 x 4	2 x 3	1½ x 2
CRV-6	1/8" x 3/16"	6 x 8 or 10	4 x 6	3 x 4	2 x 3
CRV-8	3/16" x 1/4"	8 or 10 x 12	6 x 8	4 x 6	3 x 4



✱ Colors: Valve Gray & Pink { Code as shown is for Valve Gray. To order in Pink, add P to Code; Example: CRV-2P. Pink is the color designated for Instrumentation.

MATERIAL: BUTYRATE

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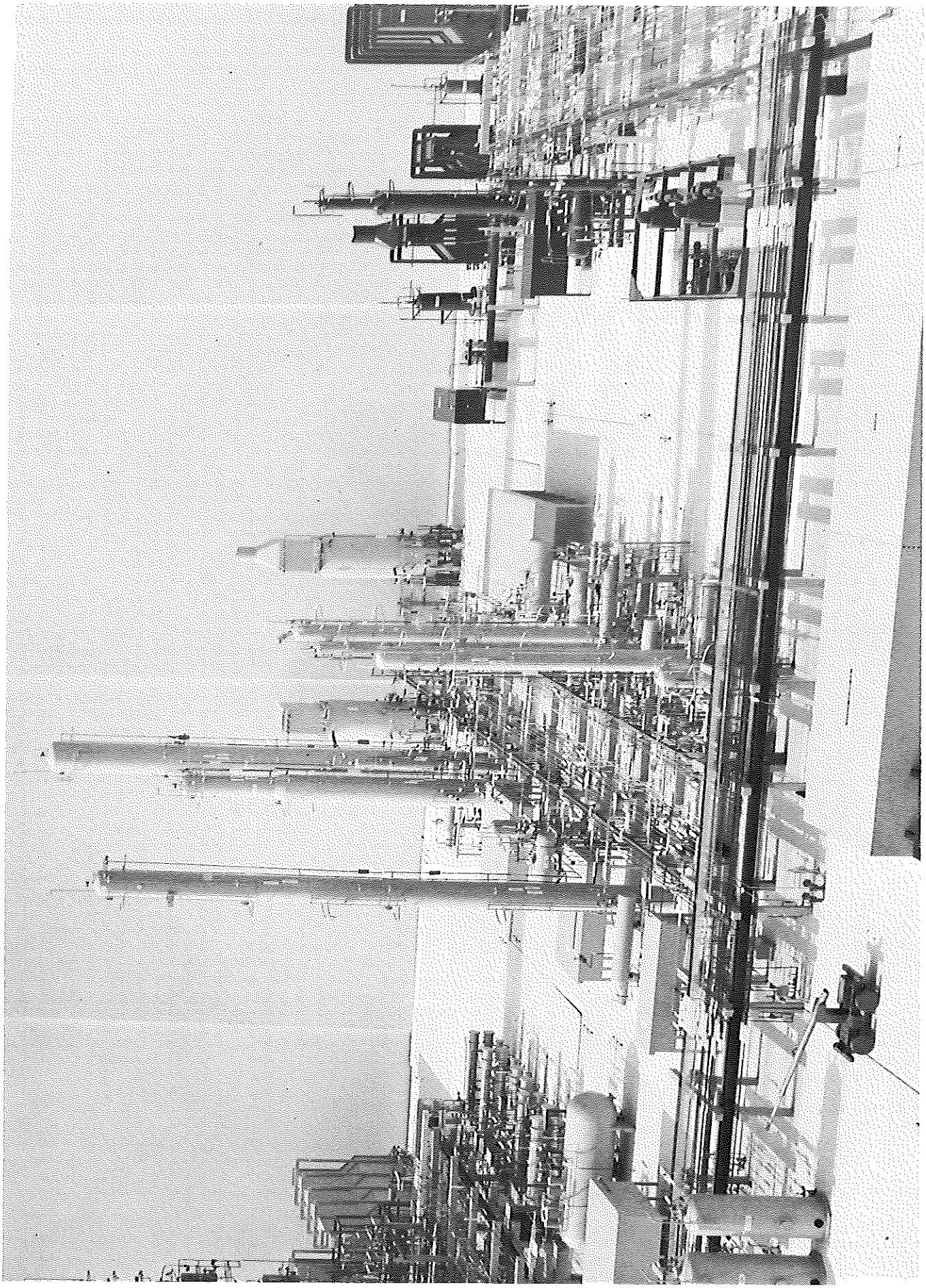
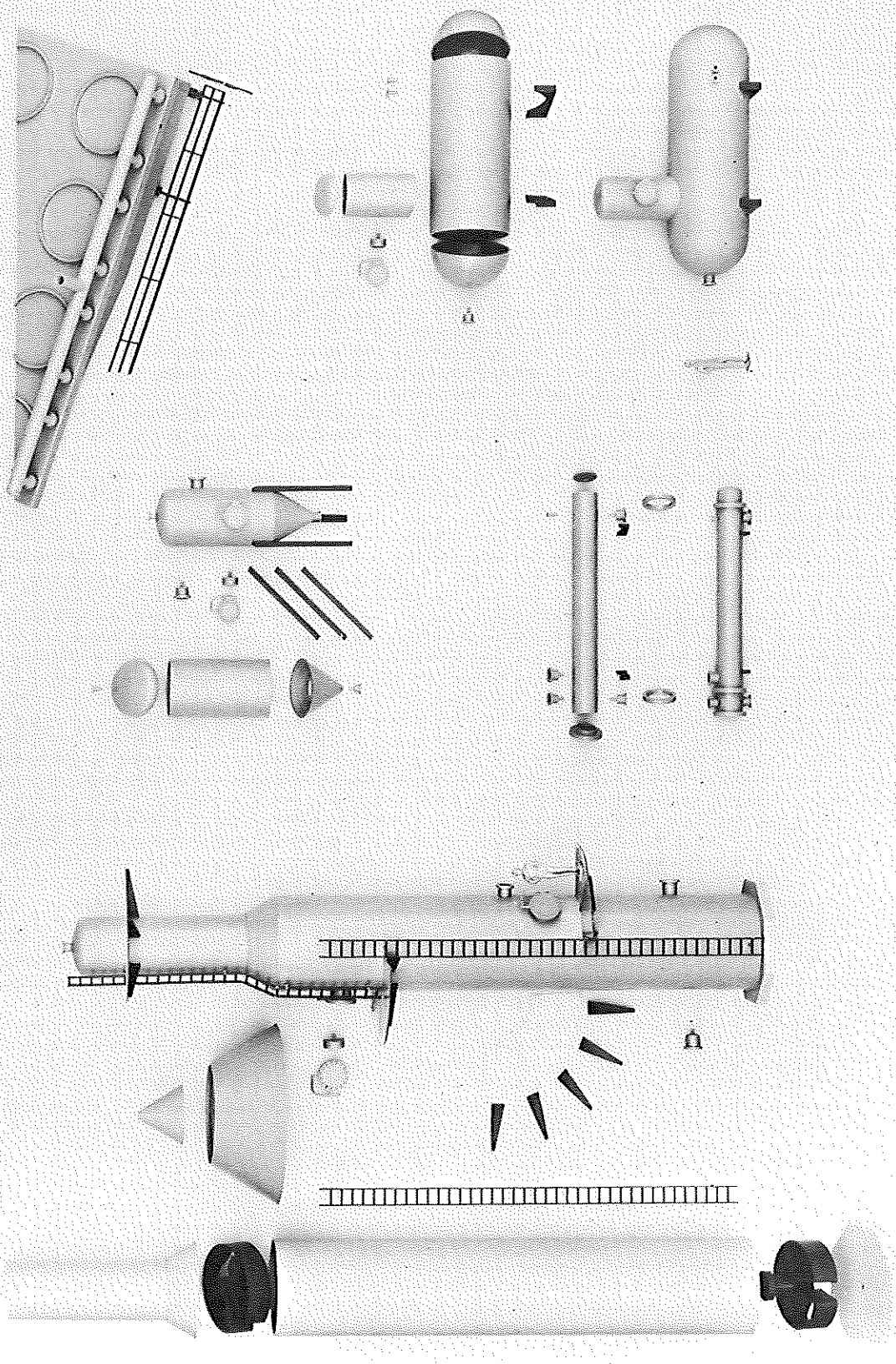
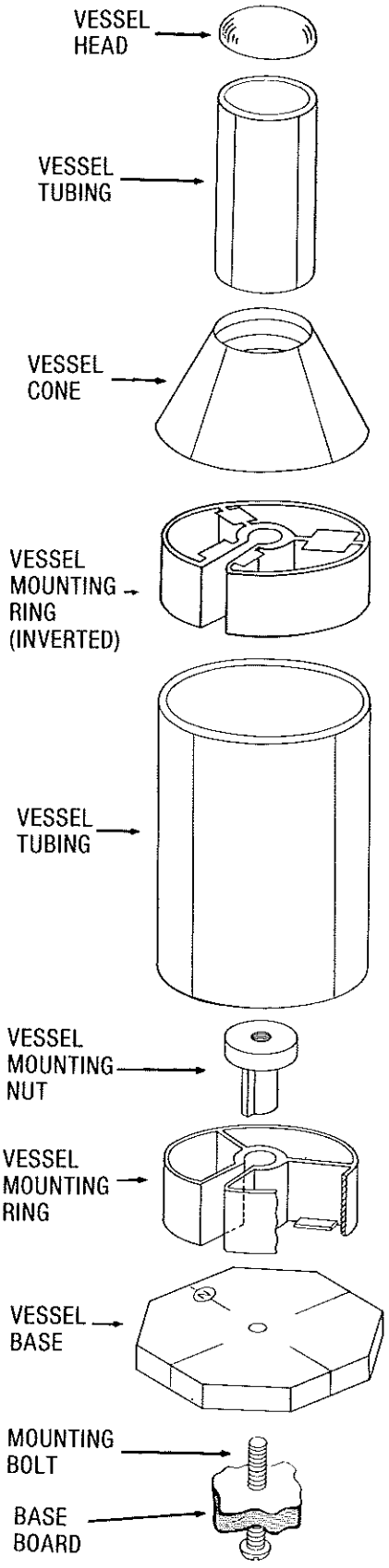


TYPICAL CENTER-LINE PIPING MODEL

PHOTO COURTESY OF FLUOR ENGINEERS & CONSTRUCTORS, LOS ANGELES, CA.

VESSEL & EQUIPMENT ASSEMBLIES





VESSEL & EQUIPMENT SYSTEM

The E.M.A. Vessel and Equipment System is designed to speed the fabrication of the large majority of equipment pieces from standard components. Small vessels, heat exchangers as well as tanks and towers can be assembled in minutes – accurately and neatly – with a total system that is compatible to the related piping and structural systems.

Careful consideration has been given to the material and production technique of each individual part to result in this logical and time saving system. Intense care was given to the mechanical design for mounting and making attachments.

The color selection, a medium shade of gray, was made with consideration for photographic contrast and to be consistent with what is most widely used. Availability in color now eliminates the time consuming task of painting – and the problems of making attachments to painted surfaces.

Color coding equipment by areas can be achieved by using a band of colored tape or colored equipment name or number labels.

All Vessel Tubing is precision extruded in a high quality formulation of ABS plastic. The Heads, Cones, Mounting Rings, Bases, etc. are all injection molded of ABS to exact tolerances.

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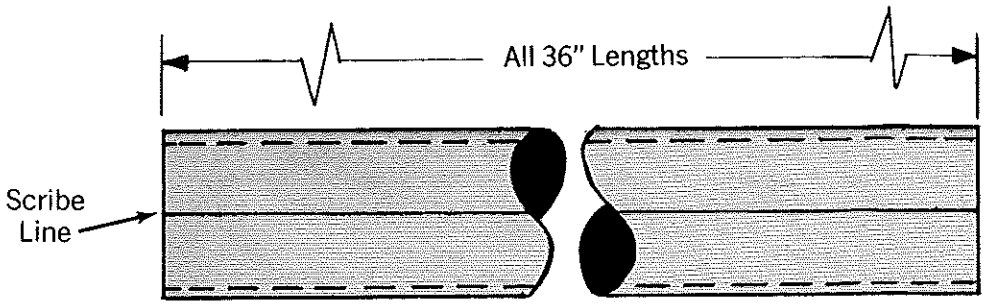
VESSEL TUBING



	CODE	ACTUAL O.D.	WALL THK.	SCALE DIAMETER			
				1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
●	VT-12	3/8"	1/16"	18"	12"	9"	6"
●	VT-14	7/16"	1/16"	21"	14"	10-1/2"	7"
●	VT-16	1/2"	1/16"	24"	16"	12"	8"
●	VT-18	9/16"	1/16"	27"	18"	13-1/2"	9"
●	VT-20	5/8"	1/16"	30"	20"	15"	10"
●	VT-24	3/4"	1/16"	3'-0"	2'-0"	1'-6"	1'-0"
●	VT-28	7/8"	1/16"	3'-6"	2'-4"	1'-9"	1'-2"
●	VT-32	1"	1/16"	4'-0"	2'-8"	2'-0"	1'-4"
●	VT-36	1-1/8"	1/16"	4'-6"	3'-0"	2'-3"	1'-6"
●	VT-40	1-1/4"	1/16"	5'-0"	3'-4"	2'-6"	1'-8"
●	VT-150	1-1/2"	3/32"	6'-0"	4'-0"	3'-0"	2'-0"
●	VT-175	1-3/4"	3/32"	7'-0"	4'-8"	3'-6"	2'-4"
●	VT-200	2"	3/32"	8'-0"	5'-4"	4'-0"	2'-8"
	VT-225	2-1/4"	3/32"	9'-0"	6'-0"	4'-6"	3'-0"
	VT-250	2-1/2"	3/32"	10'-0"	6'-8"	5'-0"	3'-4"
	VT-275	2-3/4"	3/32"	11'-0"	7'-4"	5'-6"	3'-8"
	VT-300	3"	3/32"	12'-0"	8'-0"	6'-0"	4'-0"
	VT-325	3-1/4"	1/8"	13'-0"	8'-8"	6'-6"	4'-4"
	VT-350	3-1/2"	1/8"	14'-0"	9'-4"	7'-0"	4'-8"
	VT-375	3-3/4"	1/8"	15'-0"	10'-0"	7'-6"	5'-0"
	VT-400	4"	1/8"	16'-0"	10'-8"	8'-0"	5'-4"
	VT-425	4-1/4"	1/8"	17'-0"	11'-4"	8'-6"	5'-8"
	VT-450	4-1/2"	1/8"	18'-0"	12'-0"	9'-0"	6'-0"
	VT-475	4-3/4"	1/8"	19'-0"	12'-8"	9'-6"	6'-4"
	VT-500	5"	1/8"	20'-0"	13'-4"	10'-0"	6'-8"
	VT-525	5-1/4"	1/8"	21'-0"	14'-0"	10'-6"	7'-0"
	VT-550	5-1/2"	1/8"	22'-0"	14'-8"	11'-0"	7'-4"
	VT-575	5-3/4"	1/8"	23'-0"	15'-4"	11'-6"	7'-8"
	VT-600	6"	1/8"	24'-0"	16'-0"	12'-0"	8'-0"

COLOR: VESSEL & EQUIPMENT GRAY

● Two scribe lines 180° apart for orientation — All others have four lines 90° apart. Precision extruded of ABS plastic.

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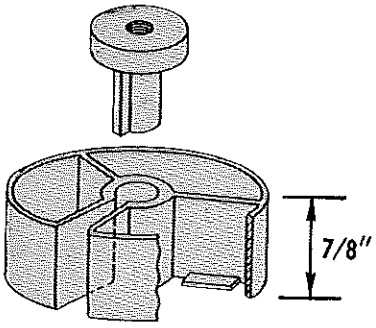
VESSEL MOUNTING RING SETS



COLOR: STEEL GRAY

CODE
VMR-250
VMR-275
VMR-300
VMR-325
VMR-350
VMR-375
VMR-400
VMR-425
VMR-450
VMR-475
VMR-500
VMR-525
VMR-550
VMR-575
VMR-600

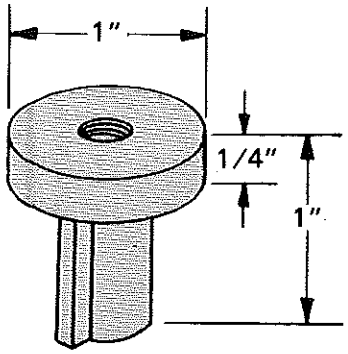
Note: Mounting Rings are not provided for Tubing Sizes smaller than VT-250. See suggestions below for mounting smaller vessel tubing.

Vessel mounting rings fit vessel tubing of same code number. Example: Mounting ring VMR-450 fits tubing VT-450.

Mounting nut supplied with mounting ring.

Mounting Rings are precision injection molded of ABS plastic and are designed to provide maximum contact with inside of Vessel Tubing. This is to insure a perfect bond and a secure mounting to the baseboard. The ribs on the Ring act as beams and have great strength. The Mounting Nuts (included with Mounting Ring) are injection molded of reinforced ABS plastic for maximum tensile strength and are threaded for standard metal bolts.

Note: Unless otherwise specified all Rings will be supplied with American Standard Thread Nuts.

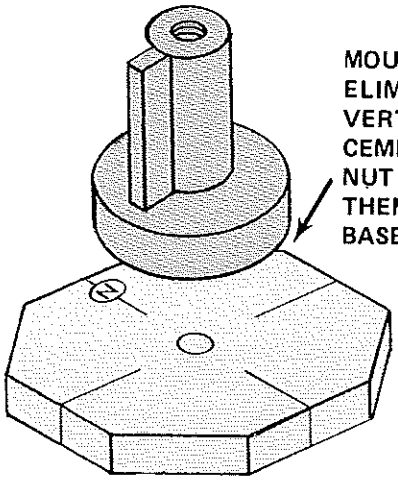


VESSEL MOUNTING NUTS

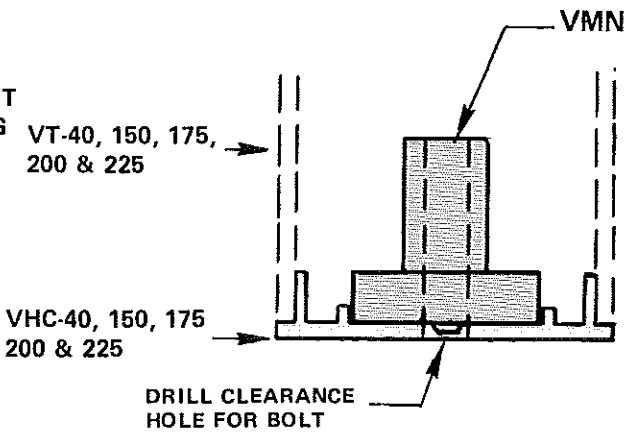
CODE	COLOR	THREAD
VMN-20	Steel Gray	1/4-20 American Standard
VMN-33	White	6mm x 1mm Metric

NOTE: Mounting Nuts are injection molded of reinforced ABS Plastic for maximum tensile strength and color coded according to thread.

SMALL VERTICAL VESSEL MOUNTING

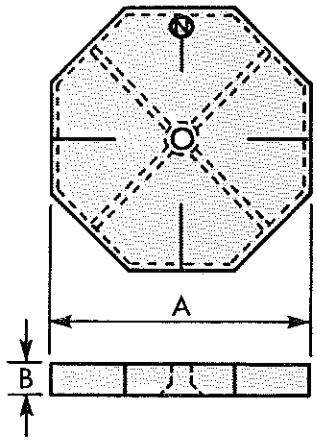


MOUNTING RINGS CAN BE ELIMINATED IN SHORT VERTICAL VESSELS – SOLVENT CEMENT INVERTED MOUNTING NUT TO OCTAGON BASE AND THEN CEMENT VESSEL TO BASE.



VESSEL BASES

(OCTAGON)



All Octagons have orientation lines on top and sides at 90° Spacing.

North is indicated

Clearance hole for mounting bolt.

Code Number imprinted.

'A' SCALE SIZES				'A' ACTUAL	VO3 SERIES 'B' = 3/16"	VO4 SERIES 'B' = 1/4"	VO6 SERIES 'B' = 3/8"
1/4" Scale 1:48	3/8" Scale 1:32	1/2" Scale 1:24	3/4" Scale 1:16		Code	Code	Code
6'-0"	4'-0"	3'-0"	2'-0"	1-1/2"	VO3-150	VO4-150	VO6-150
6'-9"	4'-6"	3'-5"	2'-3"	1-11/16"	VO3-168	VO4-168	VO6-168
7'-6"	5'-0"	3'-9"	2'-6"	1-7/8"	VO3-187	VO4-187	VO6-187
8'-3"	5'-6"	4'-2"	2'-9"	2-1/16"	VO3-206	VO4-206	VO6-206
9'-0"	6'-0"	4'-6"	3'-0"	2-1/4"	VO3-225	VO4-225	VO6-225
9'-9"	6'-6"	4'-11"	3'-3"	2-7/16"	VO3-243	VO4-243	VO6-243
10'-6"	7'-0"	5'-3"	3'-6"	2-5/8"	VO3-262	VO4-262	VO6-262
11'-3"	7'-6"	5'-8"	3'-9"	2-13/16"	VO3-281	VO4-281	VO6-281
12'-0"	8'-0"	6'-0"	4'-0"	3"	VO3-300	VO4-300	VO6-300
12'-9"	8'-6"	6'-5"	4'-3"	3-3/16"	VO3-318	VO4-318	VO6-318
13'-6"	9'-0"	6'-9"	4'-6"	3-3/8"	VO3-337	VO4-337	VO6-337
14'-3"	9'-6"	7'-2"	4'-9"	3-9/16"	VO3-356	VO4-356	VO6-356
15'-0"	10'-0"	7'-6"	5'-0"	3-3/4"	VO3-375	VO4-375	VO6-375
16'-6"	11'-0"	8'-3"	5'-6"	4-1/8"	VO3-412	VO4-412	VO6-412
18'-0"	12'-0"	9'-0"	6'-0"	4-1/2"	VO3-450	VO4-450	VO6-450
19'-6"	13'-0"	9'-9"	6'-6"	4-7/8"	VO3-487	VO4-487	VO6-487
21'-0"	14'-0"	10'-6"	7'-0"	5-1/4"	VO3-525	VO4-525	VO6-525
22'-6"	15'-0"	11'-3"	7'-6"	5-5/8"	VO3-562	VO4-562	VO6-562
24'-0"	16'-0"	12'-0"	8'-0"	6"	VO3-600	VO4-600	VO6-600
25'-6"	17'-0"	12'-9"	8'-6"	6-3/8"	VO3-637	VO4-637	VO6-637
27'-0"	18'-0"	13'-6"	9'-0"	6-3/4"	VO3-675	VO4-675	VO6-675

COLOR: CONCRETE GRAY

All bases are precision injection molded of ABS plastic. VO3 series (3/16" thick) are molded without ribs. Bases can be stacked to any desired thickness.

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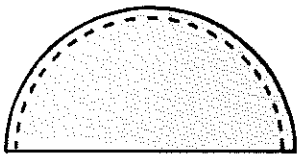
VESSEL HEADS

ELLIPTICAL

CODE	ACTUAL SIZE
VHE-12	3/8"
VHE-14	7/16"
VHE-16	1/2"
VHE-18	9/16"
VHE-20	5/8"
VHE-24	3/4"
VHE-28	7/8"
VHE-32	1"
VHE-36	1-1/8"
VHE-40	1-1/4"
VHE-150	1-1/2"
VHE-175	1-3/4"
VHE-200	2"
VHE-225	2-1/4"
VHE-250	2-1/2"
VHE-275	2-3/4"
VHE-300	3"
VHE-325	3-1/4"
VHE-350	3-1/2"
VHE-375	3-3/4"
VHE-400	4"
VHE-425	4-1/4"
VHE-450	4-1/2"
VHE-475	4-3/4"
VHE-500	5"
VHE-525	5-1/4"
VHE-550	5-1/2"
VHE-575	5-3/4"
VHE-600	6"

DISHED

CODE	ACTUAL SIZE
USE ELLIPTICAL HEADS FOR THESE SIZES	
VHD-175	1-3/4"
VHD-200	2"
VHD-225	2-1/4"
VHD-250	2-1/2"
VHD-275	2-3/4"
VHD-300	3"
VHD-325	3-1/4"
VHD-350	3-1/2"
VHD-375	3-3/4"
VHD-400	4"
VHD-425	4-1/4"
VHD-450	4-1/2"
VHD-475	4-3/4"
VHD-500	5"
VHD-525	5-1/4"
VHD-550	5-1/2"
VHD-575	5-3/4"
VHD-600	6"



HEMISPHERICAL

CODE	ACTUAL SIZE
VHH-12	3/8"
VHH-14	7/16"
VHH-16	1/2'
VHH-18	9/16"
VHH-20	5/8"
VHH-24	3/4"
VHH-28	7/8"
VHH-32	1"
VHH-36	1-1/8"
VHH-40	1-1/4"
VHH-150	1-1/2"
VHH-175	1-3/4"
VHH-200	2"
VHH-225	2-1/4"
VHH-250	2-1/2"
VHH-275	2-3/4"
VHH-300	3"
VHH-325	3-1/4"
VHH-350	3-1/2"
VHH-375	3-3/4"
VHH-400	4"
VHH-425	4-1/4"
VHH-450	4-1/2"
VHH-475	4-3/4"
VHH-500	5"
VHH-525	5-1/4"
VHH-550	5-1/2"
VHH-575	5-3/4"
VHH-600	6"

MATERIAL: ABS Plastic or Clear Acrylic.

COLOR: Vessel & Equipment Gray or Clear Acrylic. **For Clear Acrylic Heads, omit V from code.**

All heads are injection molded to the tangent line. Centers of all heads are indicated.
On all heads 1-3/4" diameter and up, the 90° quadrants are indicated at the tangent line.

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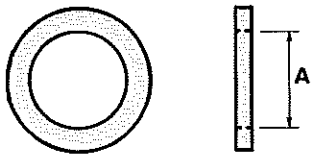
EXCHANGER FLANGES

CODE	SIZE 'A'
VX-12	3/8"
VX-14	7/16"
VX-16	1/2"
VX-18	9/16"
VX-20	5/8"
VX-24	3/4"
VX-28	7/8"
VX-32	1"
VX-36	1-1/8"
VX-40	1-1/4"
VX-150	1-1/2"
VX-175	1-3/4"
VX-200	2"
VX-225	2-1/4"



SIZE: I.D. of Flange is same as O.D. of tubing.

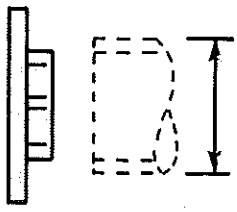
Flanges may be slit to allow for tolerance of tubing.

Same diameter and width as flanged heads.

VESSEL HEADS

FLANGED HEADS

CODE	SIZE 'A'
VHF-12	3/8"
VHF-14	7/16"
VHF-16	1/2"
VHF-18	9/16"
VHF-20	5/8"
VHF-24	3/4"
VHF-28	7/8"
VHF-32	1"
VHF-36	1-1/8"
VHF-40	1-1/4"



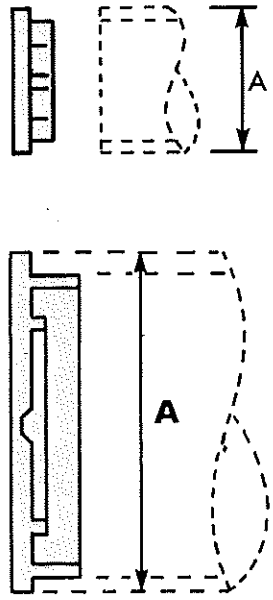
NOTE: For larger flanged heads use a VX and VHC together.

COLOR: VESSEL & EQUIPMENT GRAY
MATERIAL: ABS

A small indent on all heads locates the true center for layout and drilling. Flanged heads are same diameter and width as exchanger flanges.

FLAT CAPS

CODE	SIZE 'A'
VHC-12	3/8"
VHC-14	7/16"
VHC-16	1/2"
VHC-18	9/16"
VHC-20	5/8"
VHC-24	3/4"
VHC-28	7/8"
VHC-32	1"
VHC-36	1-1/8"
VHC-40	1-1/4"
VHC-150	1-1/2"
VHC-175	1-3/4"
VHC-200	2"
VHC-225	2-1/4"



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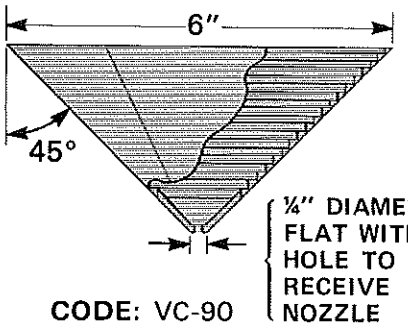
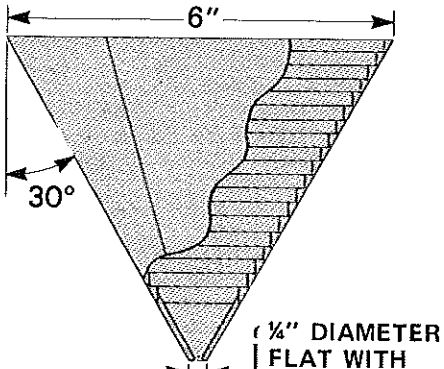
VESSEL CONES & TRANSITION PIECES

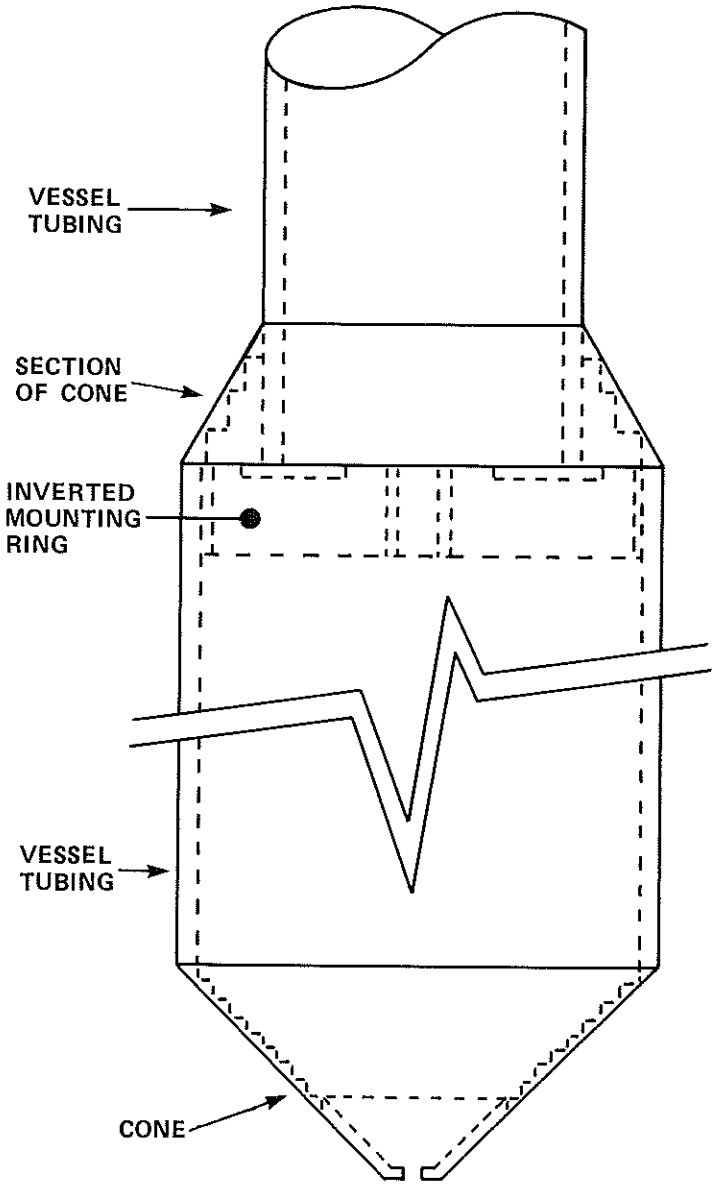


CODE: VC-90



CODE: VC-60

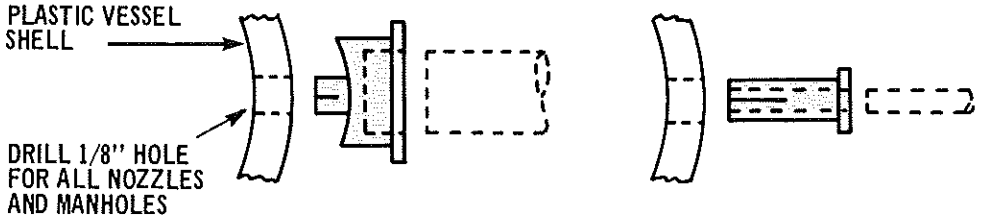
COLOR: VESSEL & EQUIPMENT GRAY



ASSEMBLY DETAILS

Vessel Cones are precision injection molded of ABS plastic. The steps and risers are designed to fit the diameters and ends of all the Vessel Tubing sizes. The thin section at each step allows easy knife cutting for any size cone or combination of diameter transitions. 90° orientation lines are on exterior of cones.

NOTE: To cut cone we suggest using a utility knife with retractable blade exposed about 1/8 inch. Cut from outside.



NOZZLES

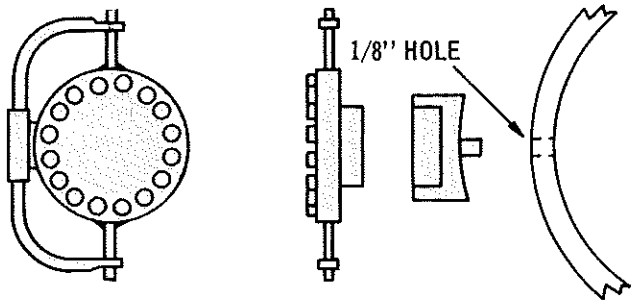
CODE	ACTUAL SIZE	SCALE SIZES IN INCHES			
		1/4" 1:48	3/8" 1:32	1/2" 1:24	3/4" 1:16
VN-1	1/32	1-1/2 OR 2	1 OR 1-1/2	3/4 OR 1	1/2 OR 3/4
VN-2	1/16	3	2	1-1/2	1
VN-3	3/32	4	3	2	1-1/2
VN-4	1/8	6	4	3	2
VN-6	3/16	8 OR 10	6	4	3
VN-8	1/4	12	8	6	4
VN-10	5/16	14 OR 16	10	8	5
VN-12	3/8	18	12	—	6
VN-14	7/16	20	14	10	—
VN-16	1/2	24	16	12	8
VN-18	9/16	28	18	14	—
VN-20	5/8	30	20	16	10
VN-24	3/4	36	24	18	12

COLOR: VESSEL & EQUIPMENT GRAY

MANHOLES

CODE	SCALE SIZE IN INCHES			
	1/4" 1:48	3/8" 1:32	1/2" 1:24	3/4" 1:16
VMH-18	24	18	15	—
VMH-24	36	24	18	—
VMH-36	—	36	24	18

COLOR: VESSEL & EQUIPMENT GRAY



Flange can be used for either right or left hand davit, hinged, or plain blind flange by trimming parts not required.

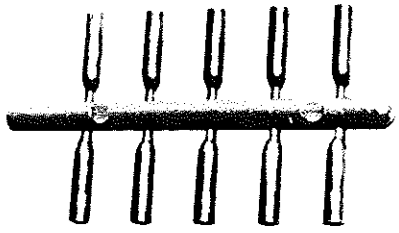
Nozzles and manholes are precision injection molded of Implex (an Acrylic based Plastic).

VESSEL HOLE PLUGS

When a nozzle is relocated or a hole drilled in error the hole may be easily plugged merely by inserting this tapered fitting.

CODE
VNP-4

NOTE: One VNP-4 consists of 10 plugs.
COLOR: VESSEL & EQUIPMENT GRAY



Vessel Hole Plugs
For 1/8" Holes

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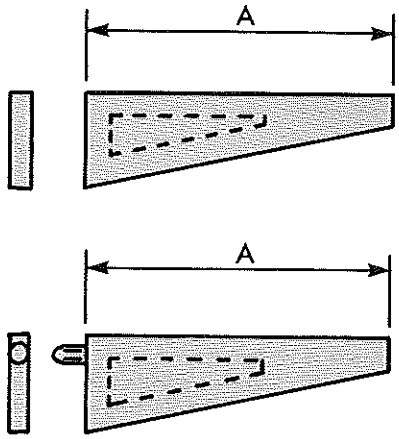


Use Drill #51 for KP-8 – Drill #43 for others.

MATERIAL: Implex (an acrylic based plastic)

COLOR: STEEL GRAY & CLEAR

Code as shown is for Steel Gray color. To order in Clear, add C to Code; Example: VPB-16C.

VESSEL PLATFORM BRACKETS

(SUPPORTS AND GUSSETS)

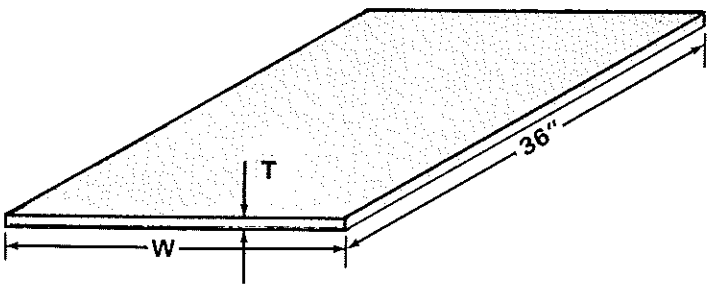
CODE ✳	SCALE	"A" ACTUAL
VPB-8	1/4" = 1'-0" (1:48)	1-1/16"
VPB-12	3/8" = 1'-0" (1:32)	1-5/8"
VPB-16	1/2" = 1'-0" (1:24)	2-1/8"
VPB-24	3/4" = 1'-0" (1:16)	3-1/4"

CODE ✳	SCALE	"A" ACTUAL
KP-8	1/4" = 1'-0" (1:48)	1-1/16"
KP-12	3/8" = 1'-0" (1:32)	1-5/8"
KP-16	1/2" = 1'-0" (1:24)	2-1/8"
KP-24	3/4" = 1'-0" (1:16)	3-1/4"

The VPB Brackets are designed to bond securely to the Vessel Tubing and Plastic Structurals using Plastic Piping Cement (page 285) eliminating the need for drilling. They are designed for platforms extending 4'-6" from the vessel shell and can be trimmed for narrower platforms. Clear Brackets are convenient for fictitious pipe supports and as structural gussets.

NOTE: See Triangular Gussets Page 129

VESSEL & EQUIPMENT SHEET STOCK



CODE	T	W
VESO-1	.020"	12"
VES-1	1/32"	12"
VES-2	1/16"	12"
VES-3	3/32"	12"
VES-4	1/8"	12"
VES-11	1/32"	24"
VES-12	1/16"	24"
VES-13	3/32"	24"
VES-14	1/8"	24"

NOTE: SEE PLASTIC CUTTER KS-2 PAGE 301

COLOR: Vessel & Equipment Gray
Precision Extruded of ABS Plastic.

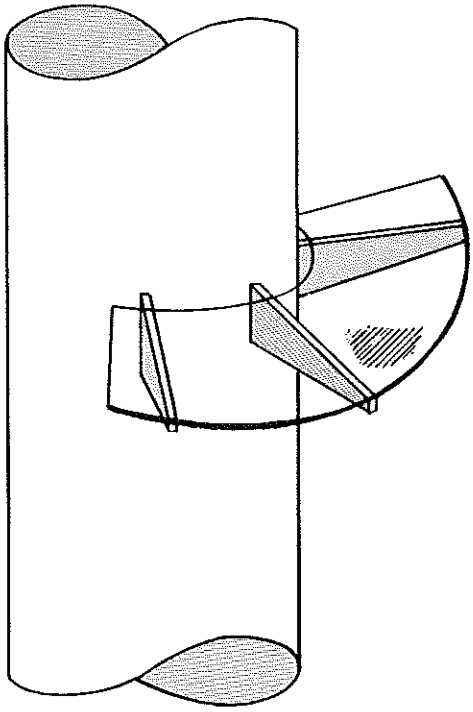
This material is extruded to extremely close tolerances and can be cut with the usual tools (power saw, hand saw, jig and band saw). A good bonding edge can also be achieved by scribing and breaking and the .020 and 1/32" can be cut with scissors or tin snips. The thinner sheets are ideal for making large cylindrical vessels using the wrapping technique.

ABS is also one of the best plastics for heat or vacuum forming and, of course, has excellent bonding characteristics, not only to itself but to other commonly used plastics. The Vessel and Equipment Gray color was selected for those using our Vessel System to enable them to fabricate flatsided equipment and eliminate the need for painting. Accidental solvent runs can be quickly removed by rubbing them with a Pink Pearl eraser and within seconds the satin finish is restored.

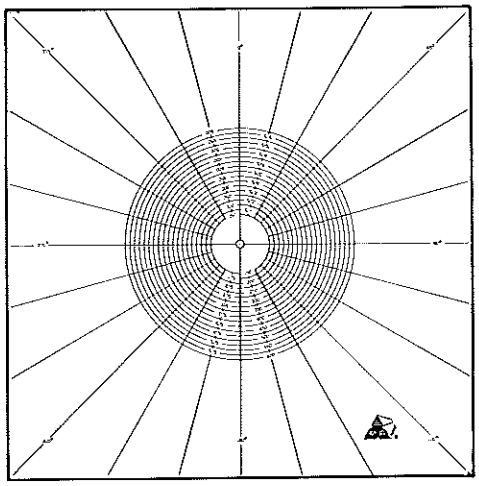
PLATFORM SYSTEM

THE SOLID PLATFORM

The clear butyrate sheet allows for cutting solid platforms to size in the safest and most efficient way. Simply lay the plastic sheet on the template and scribe the required arcs with sharp dividers and break the platform section from the sheet. Straight platforms can be made by scribing with the use of a straight edge. Scissors or tin snips may also be used to cut the butyrate sheet.



ASSEMBLY DETAILS

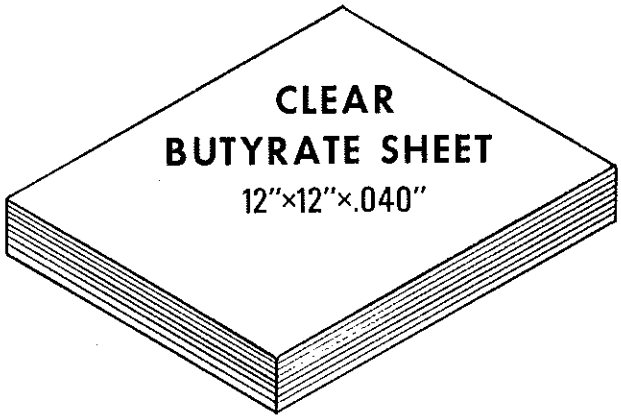


TEMPLATE
CODE: VPT-1

VESSEL PLATFORM TEMPLATE

The platform template is designed with circles the same sizes and code numbers as the Vessel Tubing. Radial orientation lines are at 15° spacing. This template, printed on high quality paper, may also be used for other orientation purposes.

SIZE: 12" x 12".



PLATFORM SHEET
CODE: VP-40

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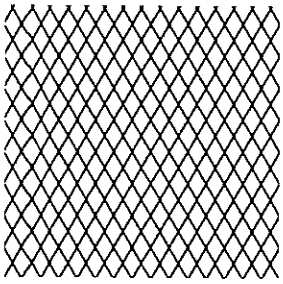
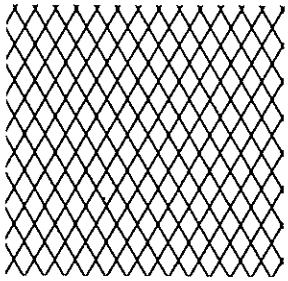


VCP-2



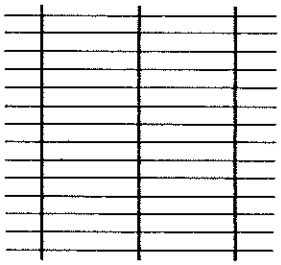
VCP-4

CHECKER PLATE

CODE	SUGGESTED SCALE
VCP-2	3/8"
VCP-4	1/2" OR 3/4"

MATERIAL: 1/16" Plexiglas

COLOR: Clear Sheet with steel gray lines



VPG-60

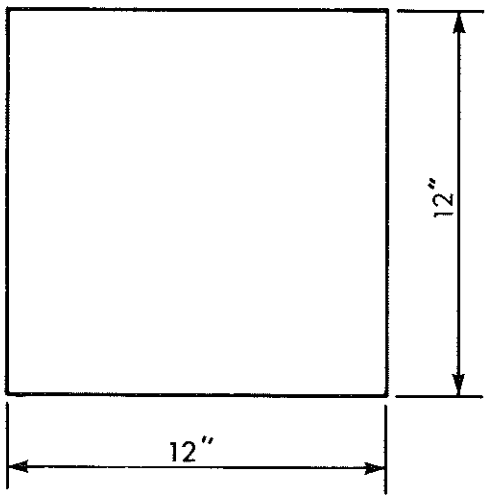
PLATFORM GRATING

CODE	SUGGESTED SCALE
VPG-60	1/2 OR 3/4

MATERIAL: 1/16" Plexiglas

COLOR: Clear Sheet with steel gray lines

This material, used for Platforms and Walkways, is printed with a checker plate or grating pattern. Printed lines (one side only) will not be affected by solvents and the Plexiglas is completely compatable with our Structural and Vessel & Equipment materials. The printed pattern has a minimal effect on obscuring view and light.



Sheet size for Clear & Printed.

PLATFORM SHEET

CODE
VPS-60

MATERIAL: 1/16" Plexiglas

This particularly convenient sized Clear Plexiglas sheet is provided for the many applications it can serve in addition to its function as clear platform material.

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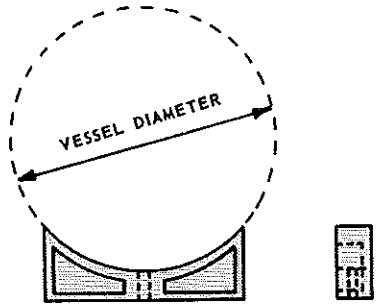
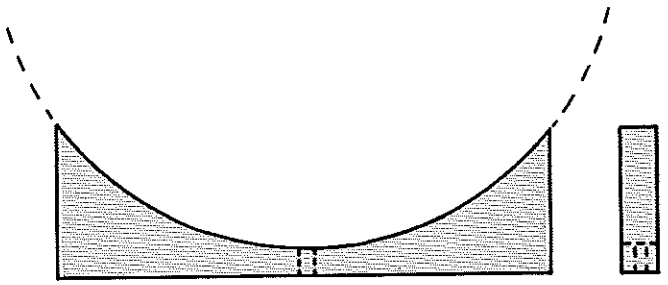
VESSEL SADDLES

	CODE	TO FIT ACTUAL DIA.	INDEX HOLE
●	VS-8	1/4"	N/A
●	VS-10	5/16"	
●	VS-12	3/8"	.067
●	VS-14	7/16"	
●	VS-16	1/2"	
●	VS-18	9/16"	
●	VS-20	5/8"	
●	VS-24	3/4"	
●	VS-28	7/8"	
●	VS-32	1"	
●	VS-36	1-1/8"	.093
●	VS-40	1-1/4"	
●	VS-150	1-1/2"	
●	VS-175	1-3/4"	
●	VS-200	2"	
	VS-225	2-1/4"	
	VS-250	2-1/2"	
	VS-275	2-3/4"	
	VS-300	3"	
	VS-325	3-1/4"	
	VS-350	3-1/2"	
	VS-375	3-3/4"	
	VS-400	4"	
	VS-425	4-1/4"	
	VS-450	4-1/2"	
	VS-475	4-3/4"	
	VS-500	5"	
	VS-525	5-1/4"	
	VS-550	5-1/2"	
	VS-575	5-3/4"	
	VS-600	6"	



VS-8 THRU VS-300



VS-325 THRU VS-600

COLOR: STEEL GRAY

● ALSO AVAILABLE IN CLEAR
To order in clear add 'C' to end of code. Example: VS-10C.

Saddles are injection molded implex plastic that snugly fit standard pipe and tubing. By selecting proper diameter, saddles may be used in any scale.

Saddles with .067" index holes can be pinned with CP-4 or with stems of PS-1 to 8. Hole can be tapped for size 2-56 machine screws.

Saddles with .093" index holes can be pinned with CP-6 or with stems of PS-10 to 24. Hole can be tapped for size 4-40 machine screws.

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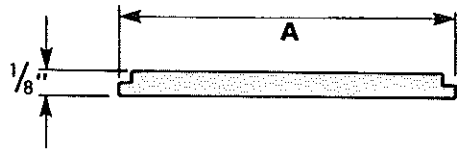
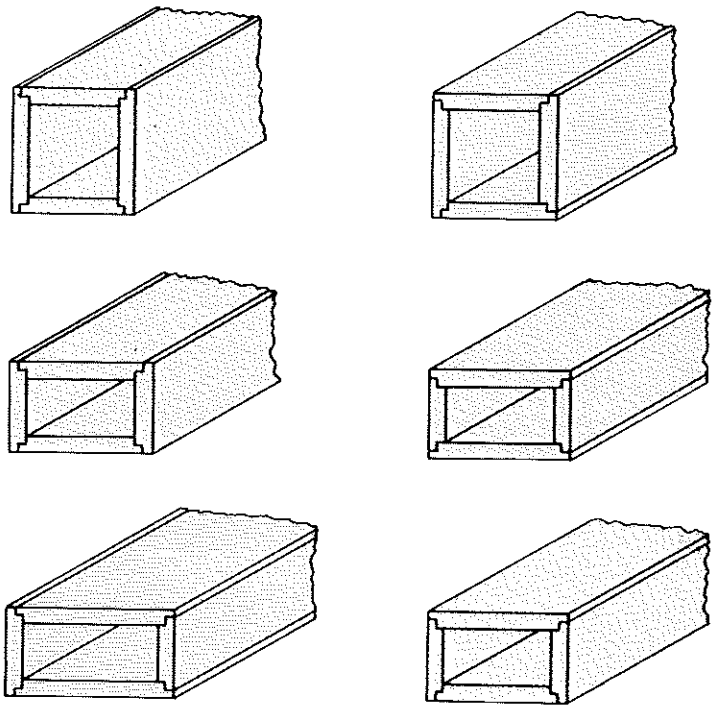
VESSEL & EQUIPMENT SYSTEM





HVAC DUCTING

CODE	ACTUAL SIZE 'A'
DV-24	3/4"
DV-28	7/8"
DV-32	1"
DV-36	1-1/8"
DV-40	1-1/4"
DV-44	1-3/8"
DV-48	1-1/2"
DV-52	1-5/8"
DV-56	1-3/4"
DV-60	1-7/8"
DV-64	2"
DV-68	2-1/8"

Precision Injection Molded 30" long.
COLOR: Vessel & Equipment Gray and Transparent Blue.
MATERIAL: Acrylic or V & E Gray ABS.
NOTE: Code shown is for Vessel & Equipment Gray color.
To order in Transparent Blue add TB to end of code.
EXAMPLE: DV-32TB

This system, with a minimum number of components, will allow the assembly of a nearly infinate assortment of square and rectangular shapes. The design is to provide 90° corners, flat sides and accurate width dimensions. All components are Injection Molded to assure complete dimensional consistency, cutting ease and cementing reliability.
Appropriate colors are provided to allow the fabrication of HVAC Ducting (Transparent Blue) and square or rectangular vessel components.
See page 124 for additional applications and colors.

For your convenience, the complete assemblies are stocked in and shipped from Thorofare, N.J.
Please see our Special Services & Products System pages 381 thru 386.

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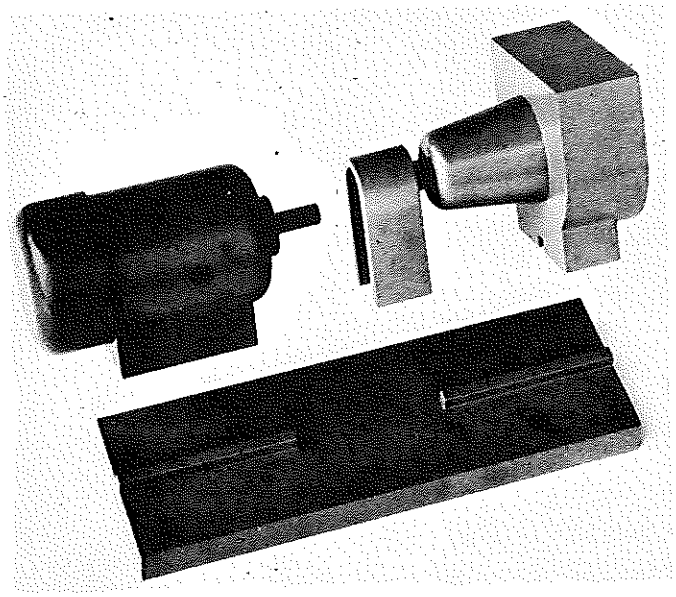
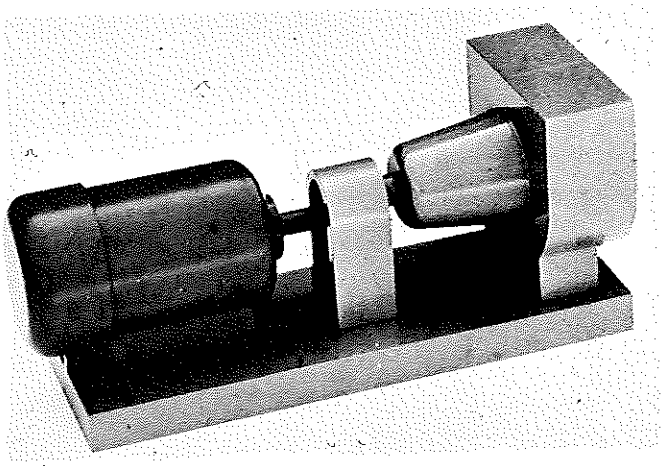
PUMP & MOTOR SYSTEM





The EMA Pump and Motor Assembly System is the result of extensive research into standards throughout the processing industries. The simplified design enables us not only to offer a very wide range of end and top suction configurations, but makes it easy for the average model facility to duplicate the design for sizes larger than we currently catalogue. The pump, motor and base are sold as assemblies or separate units. Pump and base are color coded Vessel and Equipment Gray and the Motor is Electrical Green.

The front and top face of the pump represent the face of flange locations and centerlines are scribed to facilitate nozzle location. Pumps and motors are slotted to fit keyway on baseplate, thus assuring simple and perfect alignment. All components are precision injection molded to guarantee quality and compatability with the other related systems. Charts on the following pages allow pump selection either by 'Suction and Discharge Nozzle Sizes' or simply by dimensions.

Due to the large number of combinations of pumps and motors, there may occasionally be some slight vertical misalignment of the shafts. This will almost entirely be concealed by the coupling guard and will cause no inconvenience.

This system of pump and motor assemblies will cover the vast majority of your requirements. The cost is a fraction of what it would be to custom fabricate and paint — regardless of the simplicity of design.

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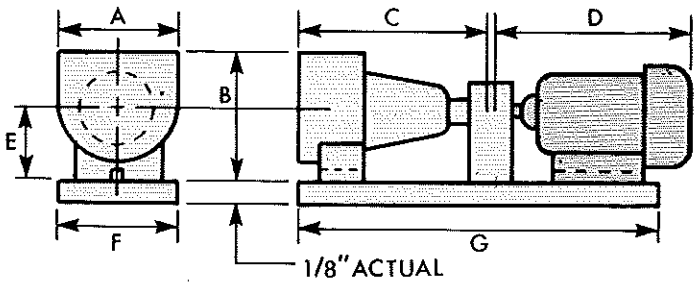
PUMPS AND MOTORS WITH BASE PLATES



END SUCTION PUMP ASSEMBLIES - 1/4" SCALE (1:48)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-3	3 x 1 – 3 x 1½	M-2	12	18	27½	23	8	13½	51
PCM-5	3 x 1 – 3 x 2	M-3	12	18	27½	27	8	13½	51
PCM-7	SELECT BY PUMP & MOTOR DIMENSIONS	M-5	18	24	36	38	13½	22½	72
PCM-9		M-7	18	24	36	46	13½	22½	81
PCM-15		M-5	21	24¾	36	38	13½	22½	72
PCM-17		M-7	21	24¾	36	46	13½	22½	81
PCM-21		M-5	24	26	36	38	13½	22½	72
PCM-23		M-7	24	26	36	46	13½	22½	81
PCM-29		M-7	27	31	36	46	16½	27	81
PCM-31		M-9	27	31	36	52	16½	27	90
PCM-37		M-7	30	30	36	46	16½	27	81
PCM-39		M-9	30	30	36	52	16½	27	90
PCM-45		M-11	36	42	50	62	21¾	31½	108
PCM-47		M-12	36	42	50	66	21¾	31½	108

Unit Price includes Pump, Motor and Base.

Color: Pump and Base: Vessel and Equipment Gray
Motor: Electrical Green

MATERIAL: ABS

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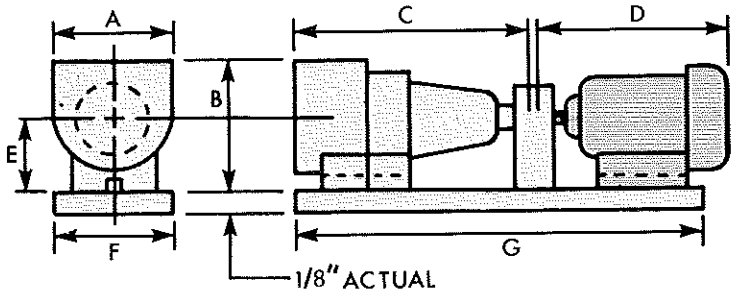
PUMPS AND MOTORS WITH BASE PLATES



TOP SUCTION PUMP ASSEMBLIES - 1/4" SCALE (1:48)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-7	3 x 2 – 4 x 3	M-5	18	24	36	38	13½	22½	72
PCM-9	3 x 2 – 4 x 3	M-7	18	24	36	46	13½	22½	81
PCM-15	4 x 3 – 6 x 4	M-5	21	24¾	36	38	13½	22½	72
PCM-17	4 x 3 – 6 x 4	M-7	21	24¾	36	46	13½	22½	81
PCM-21	6 x 4 – 8 x 6	M-5	24	25½	36	38	13½	22½	72
PCM-23	6 x 4 – 8 x 6	M-7	24	25½	36	46	13½	22½	81
PCM-29	8 x 6 – 10 x 8	M-7	27	31	36	46	16½	27	81
PCM-31	8 x 6 – 10 x 8	M-9	27	31	36	52	16½	27	90
PCM-37	SELECT BY PUMP & MOTOR DIMENSIONS	M-7	30	30	36	46	16½	27	81
PCM-39		M-9	30	30	36	52	16½	27	90
PCM-45		M-11	36	42	50	62	21¾	31½	108
PCM-47		M-12	36	42	50	66	21¾	31½	108

Unit Price includes Pump, Motor and Base.

Color: Pump and Base: Vessel and Equipment Gray
Motor: Electrical Green

MATERIAL: ABS

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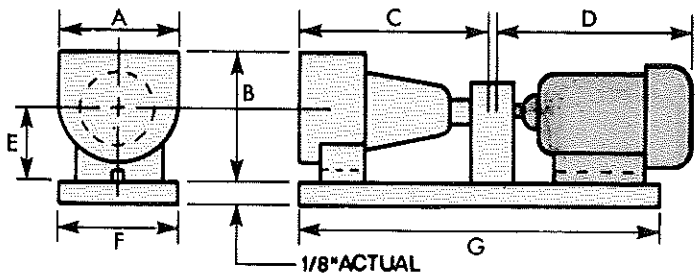
PUMPS AND MOTORS WITH BASE PLATES



END SUCTION PUMP ASSEMBLIES - 3/8" SCALE (1:32)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-3	1½ x 1 – 2 x 1	M-2	8	12	17½	16½	5½	9	34
PCM-5	1½ x 1 – 2 x 1	M-3	8	12	17½	18	5½	9	34
PCM-7	3 x 1 – 3 x 1½	M-5	12	16½	23½	25½	9	15	48
PCM-9	3 x 1½ – 3 x 2	M-7	12	16½	23½	30½	9	15	54
PCM-15	3 x 2 – 4 x 3	M-5	14	16½	23½	25½	9	15	48
PCM-17	3 x 2 – 4 x 3	M-7	14	16½	23½	30½	9	15	54
PCM-21	3 x 2 – 4 x 3	M-5	16	17	23½	25½	9	15	48
PCM-23	3 x 2 – 4 x 3	M-7	16	17	23½	30½	9	15	54
PCM-29	4 x 2 – 6 x 4	M-7	18	20½	23½	30½	11	18	54
PCM-31	4 x 2 – 6 x 4	M-9	18	20½	23½	34½	11	18	60
PCM-37	4 x 2 – 8 x 6	M-7	20	20	23½	30½	11	18	54
PCM-39	4 x 2 – 8 x 6	M-9	20	20	23½	34½	11	18	60
PCM-45	8 x 6 – 10 x 8	M-11	24	28	33	41	14½	21	72
PCM-47	8 x 6 – 10 x 8	M-12	24	28	33	44	14½	21	72
PCM-50	10 x 8 – 12 x 10	M-13	32	34	48	50	18	32	102
PCM-52	10 x 8 – 12 x 10	M-14	32	34	48	60	18	32	102
PCM-54	SELECT	M-14	40	40	50	60	22	32	102
PCM-58	BY PUMP	M-15	40	40	50	66	22	36	114
PCM-66	& MOTOR	M-15	48	56	67	66	29	40	132
PCM-68	DIMENSIONS	M-17	48	56	67	82	29	40	132

Unit Price includes Pump, Motor and Base.

Color: Pump and Base: Vessel and Equipment Gray
Motor: Electrical Green

MATERIAL: ABS

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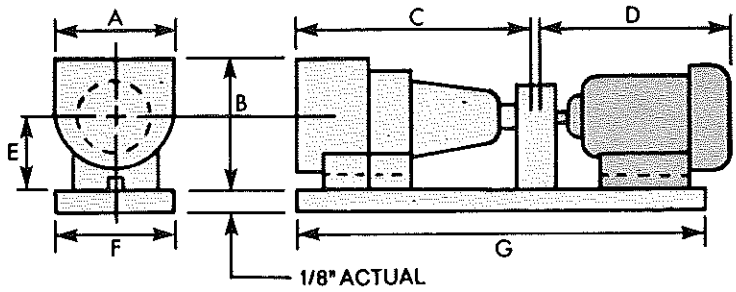
PUMPS AND MOTORS WITH BASE PLATES



TOP SUCTION PUMP ASSEMBLIES - 3/8" SCALE (1:32)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-10	2 x 1 – 3 x 1½	M-5	12	16½	30	25½	9	15	54
PCM-12	2 x 1 – 3 x 1½	M-7	12	16½	30	30½	9	15	60
PCM-18	3 x 2 – 4 x 2	M-7	14	16½	30	30½	10	15	60
PCM-24	4 x 2 – 4 x 3	M-5	16	17	30	25½	9	15	54
PCM-26	4 x 2 – 4 x 3	M-7	16	17	30	30½	9	15	60
PCM-32	4 x 3 – 6 x 4	M-7	18	20½	31	30½	11	18	60
PCM-34	4 x 3 – 6 x 4	M-9	18	20½	31	34½	11	18	66
PCM-40	6 x 4 – 8 x 6	M-9	20	20	34	34½	12	18	66
PCM-42	6 x 4 – 8 x 6	M-11	20	20	34	41	12	21	72
PCM-46	8 x 6 – 10 x 8	M-13	32	34	61	50	18	32	102
PCM-48	8 x 6 – 10 x 8	M-14	32	34	61	60	18	36	114
PCM-56	SELECT BY PUMP & MOTOR DIMENSIONS	M-14	36	41	63	60	22	36	114
PCM-60		M-15	36	41	63	66	22	36	114
PCM-62		M-15	40	42	69	66	26	40	132
PCM-64		M-17	40	42	69	82	26	40	132

Unit Price includes Pump, Motor and Base.

Color: Pump and Base: Vessel and Equipment Gray
Motor: Electrical Green

MATERIAL: ABS

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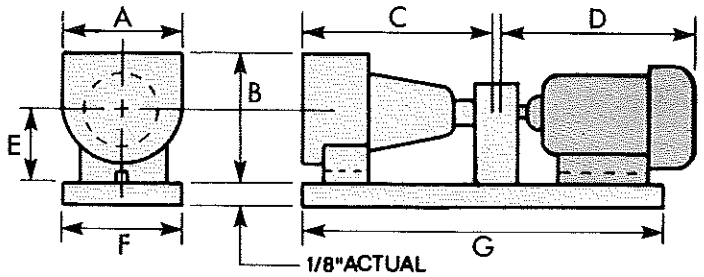
PUMPS AND MOTORS WITH BASE PLATES



END SUCTION PUMP ASSEMBLIES - 1/2" SCALE (1:24)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-7	1½ x 1 – 2 x 1	M-5	9	12	18	18½	6¾	11¼	36
PCM-9	1½ x 1 – 2 x 1	M-7	9	12	18	23	6¾	11¼	40½
PCM-10	2 x 1 – 3 x 1½	M-5	9	12	23	19¼	6¾	11¼	40½
PCM-12	2 x 1 – 3 x 1½	M-7	9	12	23	23	6¾	11¼	45
PCM-15	3 x 1½ – 3 x 2	M-5	10½	12¼	18	18½	6¾	11¼	36
PCM-17	3 x 1½ – 3 x 2	M-7	10½	12¼	18	23	6¾	11¼	40½
PCM-18	3 x 1½ – 3 x 2	M-7	10½	12½	23	23	7½	11¼	45
PCM-21	3 x 1½ – 3 x 2	M-5	12	13	18	18½	6¾	11¼	36
PCM-23	3 x 1½ – 3 x 2	M-7	12	13	18	23	6¾	11¼	40½
PCM-24	3 x 1½ – 3 x 2	M-5	12	13	23	19	6¾	11¼	40½
PCM-26	3 x 1½ – 3 x 2	M-7	12	13	23	23	6¾	11¼	45
PCM-29	3 x 2 – 4 x 3	M-7	13½	15½	18	23	8¼	13½	40½
PCM-31	3 x 2 – 4 x 3	M-9	13½	15½	18	26	8¼	13½	45
PCM-32	3 x 2 – 4 x 3	M-7	13½	15½	24	23	8¼	13½	45
PCM-34	3 x 2 – 4 x 3	M-9	13½	15½	24	26	8¼	13½	49½
PCM-37	3 x 2 – 4 x 3	M-7	15	15	18	23	8¼	13½	40½
PCM-39	3 x 2 – 4 x 3	M-9	15	15	18	26	8¼	13½	45
PCM-40	4 x 3 – 6 x 4	M-9	15	15	26	26	9	13½	49½
PCM-42	4 x 3 – 6 x 4	M-11	15	15	26	31	9	15¾	54
PCM-45	6 x 4	M-11	18	21	25½	30¾	11	15¾	54
PCM-47	6 x 4	M-12	18	21	25½	33	11	15¾	54
PCM-50	6 x 4 – 8 x 6	M-13	24	25½	36	37	13½	24	76½
PCM-52	6 x 4 – 8 x 6	M-14	24	25½	36	44	13½	24	76½
PCM-54	8 x 6 – 10 x 8	M-14	30	30	37½	44	16½	24	76½
PCM-58	8 x 6 – 10 x 8	M-15	30	30	37½	49	16½	27	85½
PCM-66	SELECT BY	M-15	36	42	50	49	21¾	30	99
PCM-68	DIMENSIONS	M-17	36	42	50	61	21¾	30	99

Unit Price includes Pump, Motor and Base.

Color: Pump and Base: Vessel and Equipment Gray
Motor: Electrical Green

MATERIAL: ABS

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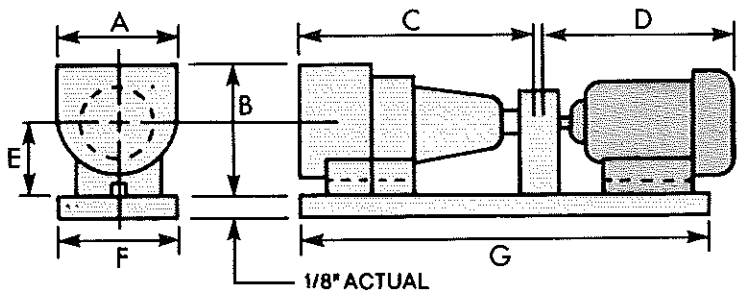
PUMPS AND MOTORS WITH BASE PLATES



TOP SUCTION PUMP ASSEMBLIES - 1/2" SCALE (1:24)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-18	2 x 1	M-7	10½	12½	23	23	7½	11¼	45
PCM-24	2 x 1 – 3 x 1½	M-5	12	13	23	19	6¾	11¼	40½
PCM-26	2 x 1 – 3 x 1½	M-7	12	13	23	23	6¾	11¼	45
PCM-32	3 x 2 – 4 x 2	M-7	13½	15½	24	23	8¼	13½	45
PCM-34	3 x 2 – 4 x 2	M-9	13½	15½	24	26	8¼	13½	49½
PCM-40	4 x 2 – 4 x 3	M-9	15	15	26	26	9	13½	49½
PCM-42	4 x 2 – 4 x 3	M-11	15	15	26	31	9	15¾	54
PCM-46	4 x 2 – 6 x 4	M-13	24	25½	46¾	37	13½	24	76½
PCM-48	4 x 2 – 6 x 4	M-14	24	25½	46¾	44	13½	27	85½
PCM-56	6 x 4 – 8 x 6	M-14	27	30¾	47¼	44	16½	27	85½
PCM-60	6 x 4 – 8 x 6	M-15	27	30¾	47¼	49	16½	27	85½
PCM-62	SELECT BY	M-15	30	31½	51¾	49	19½	30	99
PCM-64	DIMENSIONS	M-17	30	31½	51¾	61	19½	30	99

Unit Price includes Pump, Motor and Base.

Color: Pump and Base: Vessel and Equipment Gray
Motor: Electrical Green

MATERIAL: ABS

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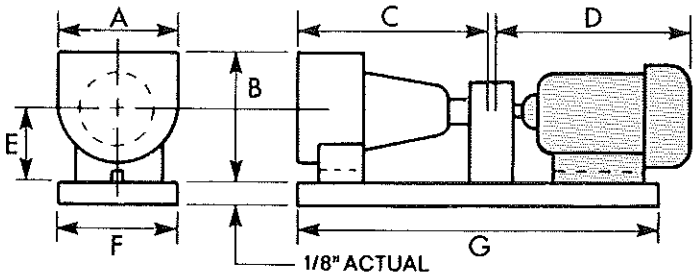
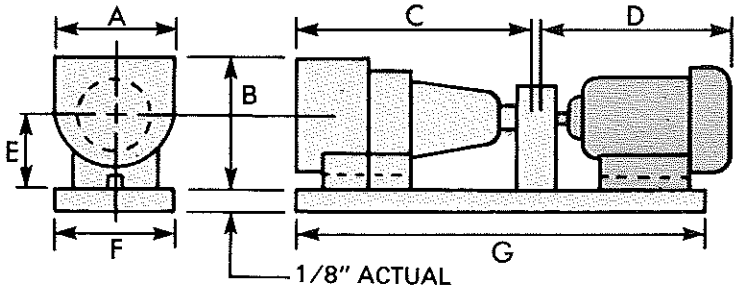
PUMPS AND MOTORS WITH BASE PLATES



END SUCTION PUMP ASSEMBLIES - 3/4" SCALE (1:16)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-32	1½ x 1	M-7	9	10¼	15½	15¼	5½	9	30
PCM-34	1½ x 1	M-9	9	10¼	15½	17¼	5½	9	33
PCM-37	1½ x 1 – 2 x 1	M-7	10	10	11¾	15¼	5½	9	27
PCM-39	1½ x 1 – 2 x 1	M-9	10	10	11¾	17¼	5½	9	30
PCM-40	2 x 1 – 3 x 1½	M-9	10	10	17	17¼	6	9	33
PCM-42	2 x 1 – 3 x 1½	M-11	10	10	17	20½	6	10½	36
PCM-45	2 x 1 – 3 x 2	M-11	12	14	16½	20½	7¼	10½	36
PCM-47	2 x 1 – 3 x 2	M-12	12	14	16½	22	7¼	10½	36
PCM-50	3 x 1½ – 3 x 2	M-13	16	17	24	25	9	16	51
PCM-52	3 x 1½ – 3 x 2	M-14	16	17	24	29¾	9	16	51
PCM-54	3 x 2 – 4 x 3	M-14	20	20	25	29¾	11	16	51
PCM-58	3 x 2 – 4 x 3	M-15	20	20	25	33	11	18	57
PCM-66	4 x 2 – 6 x 4	M-15	24	28	33½	33	14½	20	66
PCM-68	4 x 2 – 6 x 4	M-17	24	28	33½	41	14½	20	66



TOP SUCTION PUMP ASSEMBLIES - 3/4" SCALE (1:16)

CODE	SUCT./DISC. RANGE	MOTOR NO.	SCALE DIMENSIONS IN INCHES						
			A	B	C	D	E	F	G
PCM-46	2 x 1 – 3 x 1½	M-13	16	17	30½	25	9	16	51
PCM-48	2 x 1 – 3 x 1½	M-14	16	17	30½	29¾	9	18	57
PCM-56	3 x 1½ – 4 x 2	M-14	18	20½	31½	29¾	11	18	57
PCM-60	3 x 1½ – 4 x 2	M-15	18	20½	31½	33	11	18	57
PCM-62	4 x 2 – 6 x 3	M-15	20	21	34½	33	13	20	66
PCM-64	4 x 2 – 6 x 3	M-17	20	21	34½	41	13	20	66

Unit Price includes Pump, Motor and Base. Color: Pump and Base: Vessel and Equipment Gray
Motor: Electrical Green

MATERIAL: ABS

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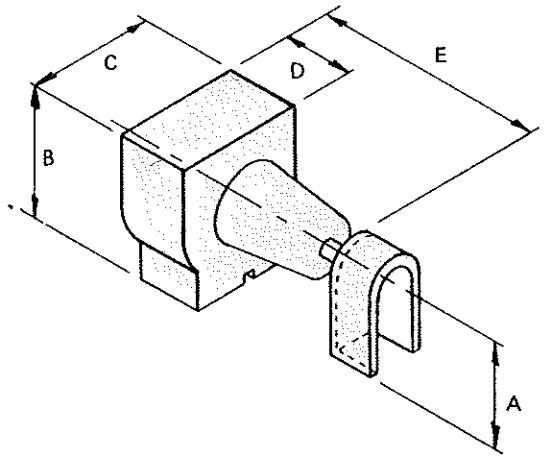
PUMPS



END SUCTION PUMPS - 1/4" SCALE (1:48)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-2	8	18	12	9	27½
PCP-4	13½	24	18	12	34
PCP-6	13½	24¾	21	12	34
PCP-8	13½	26	24	14	36
PCP-10	16½	31	27	14	36
PCP-12	16½	30	30	15	36
PCP-14	21¾	42	36	18	50
PCP-18	27	51	48	27	72
PCP-22	32	60	60	30	75
PCP-24	44	85	72	36	98

TOP SUCTION PUMPS - 1/4" SCALE (1:48)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-5	14	24	18	15	45
PCP-7	15	24½	21	15	45
PCP-9	14	26	24	15	45
PCP-11	16	31	27	17	47
PCP-13	18	30	30	21	52
PCP-19	27	51	48	30	92
PCP-21	33	61½	54	33	96
PCP-23	40	63	60	41	104

Color: Vessel & Equipment Gray

MATERIAL: ABS

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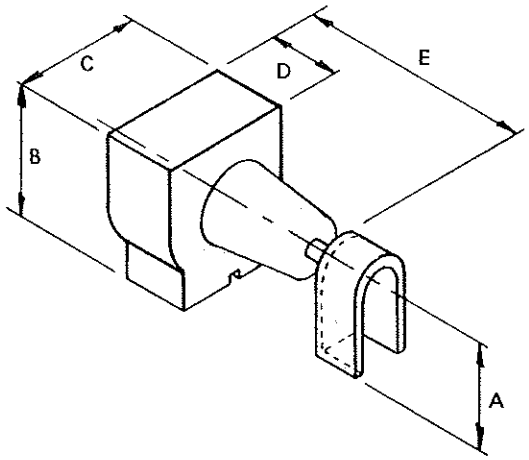
PUMPS



END SUCTION PUMPS - 3/8" SCALE (1:32)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-2	5½	12	8	6	17½
PCP-4	9	16½	12	8	23½
PCP-6	9	16½	14	8	23½
PCP-8	9	17	16	9	23½
PCP-10	11	20½	18	9	23½
PCP-12	11	20	20	10	23½
PCP-14	14½	28	24	12	33
PCP-18	18	34	32	18	48
PCP-22	22	40	40	20	50
PCP-24	29	56	48	24	67

TOP SUCTION PUMPS - 3/8" SCALE (1:32)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-5	9	16½	12	10	30
PCP-7	10	16½	14	10	30
PCP-9	9	17	16	10	30
PCP-11	11	20½	18	11	31
PCP-13	12	20	20	14	34
PCP-19	18	34	32	20	61
PCP-21	22	41	36	22	63
PCP-23	26	42	40	28	69

Color: Vessel & Equipment Gray

MATERIAL: ABS

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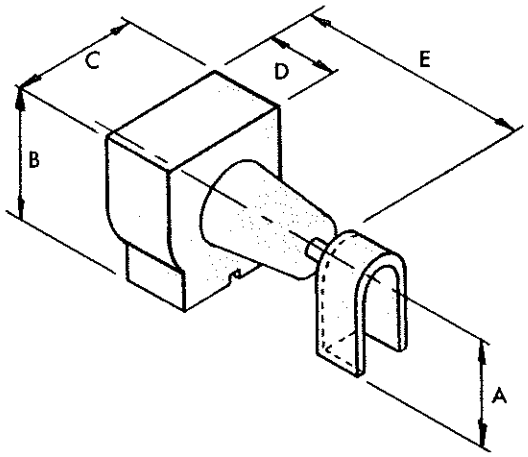
PUMPS



END SUCTION PUMPS - 1/2" SCALE (1:24)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-2	4	9	6	4½	13
PCP-4	6¾	12	9	6	17½
PCP-6	6¾	12¼	10½	6	17½
PCP-8	6¾	13	12	7	18
PCP-10	8¼	15½	13½	7	18
PCP-12	8¼	15	15	7½	18
PCP-14	11	21	18	9	25½
PCP-18	13½	25½	24	13½	36
PCP-22	16½	30	30	15	37½
PCP-24	21¾	42	36	18	50

TOP SUCTION PUMPS - 1/2" SCALE (1:24)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-5	7	12	9	7½	22½
PCP-7	7½	12½	10½	7½	23
PCP-9	6¾	13	12	7½	23
PCP-11	8¼	15½	13½	8½	24
PCP-13	9	15	15	10½	26
PCP-19	13½	25½	24	15	45¾
PCP-21	16½	31½	27	16½	47¼
PCP-23	19½	31½	30	20½	51¾

Color: Vessel & Equipment Gray

MATERIAL: ABS

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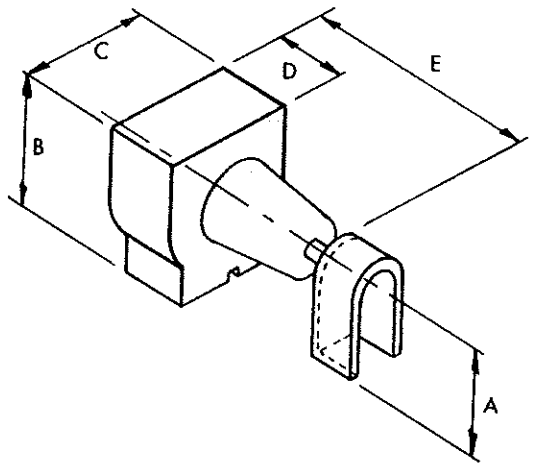
PUMPS



END SUCTION PUMPS - 3/4" SCALE (1:16)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-2	3	6	4	3	9
PCP-4	4½	8¼	6	4	11½
PCP-6	4½	8¼	7	4	11½
PCP-8	4½	8½	8	4½	12
PCP-10	5½	10¼	9	4½	12
PCP-12	5½	10	10	5	11¾
PCP-14	7¼	14	12	6	16½
PCP-18	9	17	16	9	24
PCP-22	11	20	20	10	25
PCP-24	15	28	24	12	33½

TOP SUCTION PUMPS - 3/4" SCALE (1:16)

CODE	SCALE DIMENSIONS IN INCHES				
	A	B	C	D	E
PCP-5	4½	8¼	6	5	15
PCP-7	5	8¼	7	5	15
PCP-9	4½	8½	8	5	15
PCP-11	5½	10½	9	5½	15½
PCP-13	6	10	10	7	17
PCP-19	9	17	16	10	30½
PCP-21	11	20½	18	11	31½
PCP-23	13	21	20	14	34½

Color: Vessel & Equipment Gray

MATERIAL: ABS

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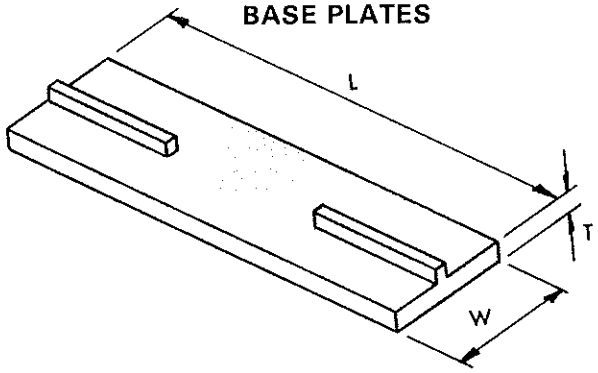
BASE PLATES



BASE PLATES - 1/4" SCALE (1:48)

CODE	SCALE DIMENSIONS		
	L	W	T
PCB-60	51"	13½	6"
PCB-62	72"	22½	6"
PCB-64	81"	22½	6"
PCB-66	90"	23"	6"
PCB-68	81"	27"	6"
PCB-70	90"	27"	6"
PCB-72	8'-2"	27"	6"
PCB-74	9'-0"	31½	6"
PCB-76	12'-9"	48"	6"
PCB-78	14'-3"	54"	6"
PCB-80	16'-6"	60"	6"

BASE PLATES - 3/8" SCALE (1:32)

CODE	SCALE DIMENSIONS		
	L	W	T
PCB-60	34"	9"	4"
PCB-62	48"	15"	4"
PCB-64	54"	15"	4"
PCB-66	60"	15"	4"
PCB-68	54"	18"	4"
PCB-70	60"	18"	4"
PCB-72	66"	18"	4"
PCB-74	72"	21"	4"
PCB-76	8'-6"	32"	4"
PCB-78	9'-6"	36"	4"
PCB-80	11'-0"	40"	4"

BASE PLATES - 1/2" SCALE (1:24)

CODE	SCALE DIMENSIONS		
	L	W	T
PCB-60	25½"	7"	3"
PCB-62	36	11½"	3"
PCB-64	40½	11½"	3"
PCB-66	45"	11½"	3"
PCB-68	40"	13½"	3"
PCB-70	45"	13½"	3"
PCB-72	49½	13½"	3"
PCB-74	54"	16"	3"
PCB-76	6'-4½	24"	3"
PCB-78	7'-1½"	27"	3"
PCB-80	8'-3"	30"	3"

BASE PLATES - 3/4" SCALE (1:16)

CODE	SCALE DIMENSIONS		
	L	W	T
PCB-60	17"	4½"	2"
PCB-62	24"	7½"	2"
PCB-64	27	7½"	2"
PCB-66	30"	7½"	2"
PCB-68	27	9"	2"
PCB-70	30"	9"	2"
PCB-72	33"	9"	2"
PCB-74	36"	10½"	2"
PCB-76	51"	16	2"
PCB-78	57"	18"	2"
PCB-80	66"	20"	2"

Color: Vessel & Equipment Gray

MATERIAL: ABS

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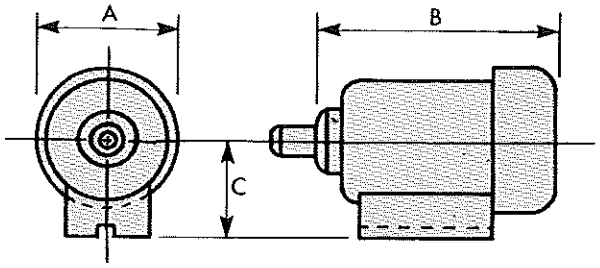
MOTORS



MOTORS - 1/4" SCALE (1:48)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	13½	18	8
	M-3	16½	22	8
	M-5	19½	32	12¾
	M-7	22	38	15
	M-9	30	44	18
*	M-11	34½	51	21
*	M-12	36	56	22½
*	M-13	37½	63	27
*	M-14	45¾	74¼	31½
*	M-15	60	84	36
*	M-17	72	108	45

MOTORS - 3/8" SCALE (1:32)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	9	12	5½
	M-3	11	15	5½
	M-5	13	21½	8½
	M-7	15	25½	10
	M-9	20	29½	12
*	M-11	23	34	14
*	M-12	24	37	15
*	M-13	25	42	18
*	M-14	30½	49½	21
*	M-15	40	56	24
*	M-17	48	72	30

MOTORS - 1/2" SCALE (1:24)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	6¾	9	4
	M-3	8	11	4
	M-5	9¾	16	6
	M-7	11	19	7½
	M-9	15	22	9
*	M-11	17	25½	10½
*	M-12	18	28	11
*	M-13	18¾	31½	13½
*	M-14	23	37	15¾
*	M-15	30	42	18
*	M-17	36	54	22½

MOTORS - 3/4" SCALE (1:16)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	4½	6	2¾
	M-3	5½	7½	2¾
	M-5	6½	10¾	4¼
	M-7	7½	12¾	5
	M-9	10	14¾	6
*	M-11	11½	17	7
*	M-12	12	18½	7½
*	M-13	12½	21	9
*	M-14	15¼	24¾	10½
*	M-15	20	28	12
*	M-17	24	36	15

* Motor Bases for M-11 thru M-17 are molded separately and supplied with motors.

MATERIAL: ABS
COLOR: Electrical Green

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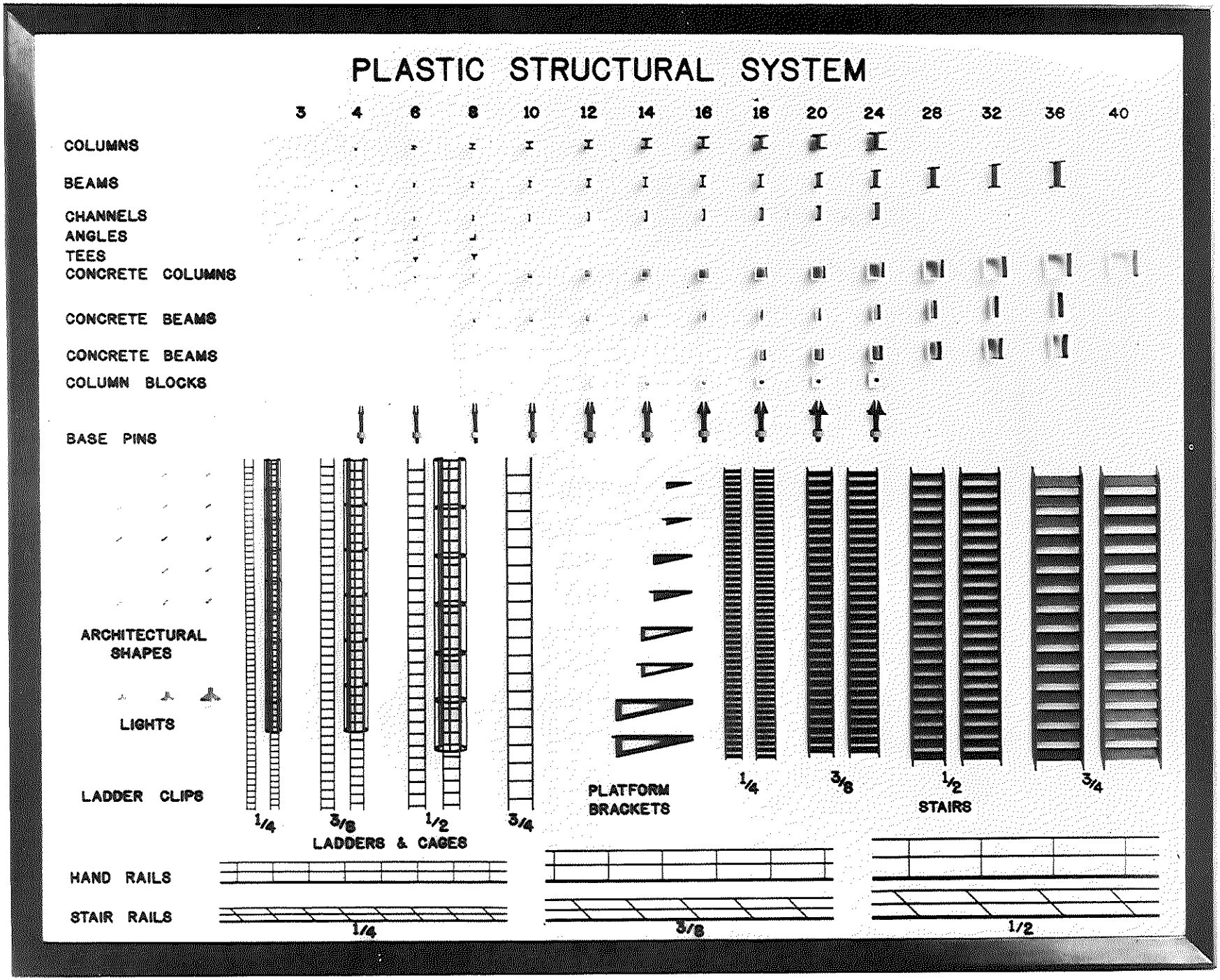
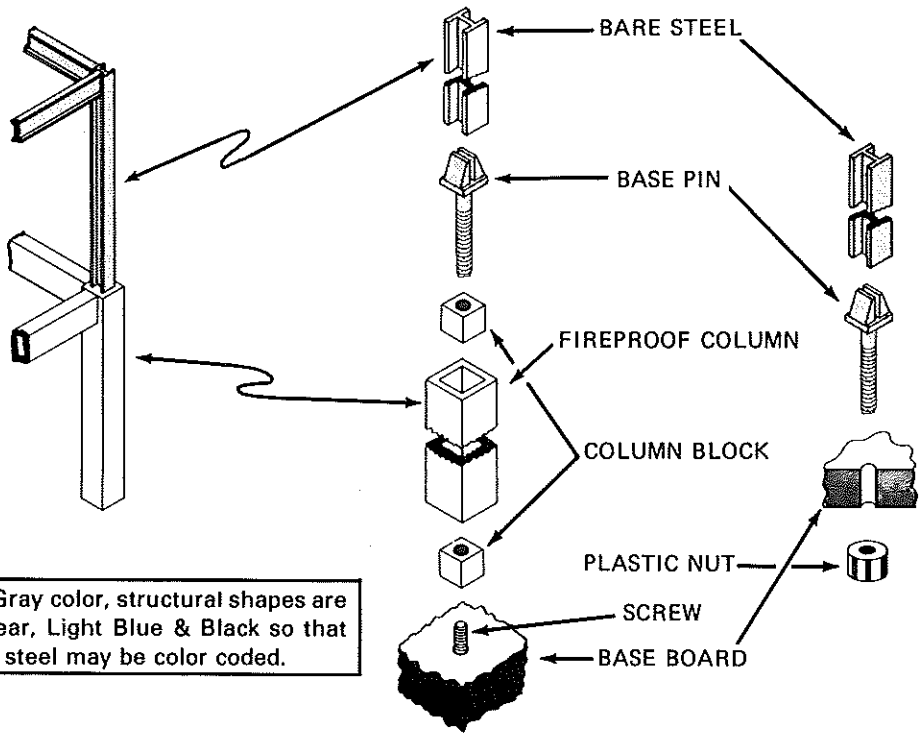

PLASTIC STRUCTURAL SYSTEM
3
4
6
8
10
12
14
16
18
20
24
28
32
36
40
COLUMNS
BEAMS
CHANNELS
ANGLES
TEES
CONCRETE COLUMNS
CONCRETE BEAMS
CONCRETE BEAMS
COLUMN BLOCKS
BASE PINS
ARCHITECTURAL SHAPES
LIGHTS
LADDER CLIPS
1/4
3/8
1/2
3/4
LADDERS & CAGES
PLATFORM BRACKETS
1/4
3/8
1/2
3/4
STAIRS
HAND RAILS
STAIR RAILS
1/4
3/8
1/2

THE E.M.A. STRUCTURAL SYSTEM

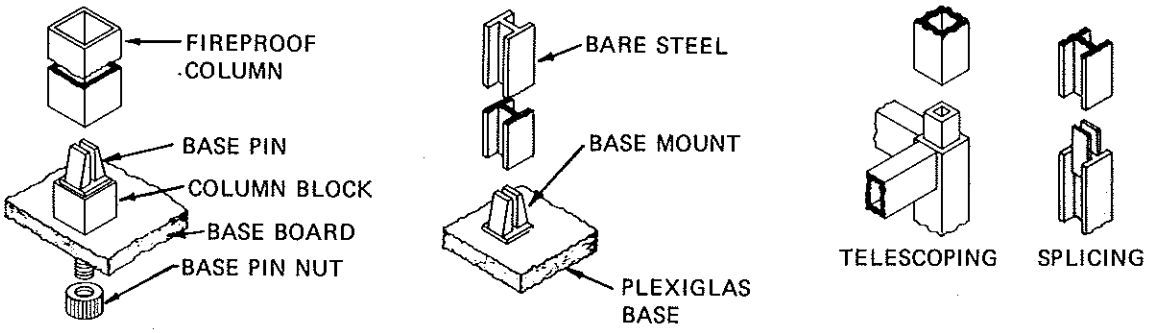
The components in the E.M.A. Structural System are all carefully molded and extruded to extremely close tolerance and in the colors to best represent the materials being simulated. The plastic we have selected (an ABS formulation) best meets our specifications for stability, rigidity and characteristics for model assembly. The material is easily machined, cements ideally, can be painted and is rigid with just the desired amount of flexibility to minimize shock. The system is designed to allow the rapid and accurate assembly of model pipeways and structures with consideration for attachment, support and compatibility with the E.M.A. Piping System.

ASSEMBLY DETAILS



In addition to Steel Gray color, structural shapes are also available in Clear, Light Blue & Black so that various functions of steel may be color coded.

REMOVABLE STRUCTURE DETAILS



Fireproof Columns are designed so that alternate sizes telescope. This feature facilitates the design of model structures with removable levels. For example: The top level of a multi-level pipeway can easily be removed and photographed separately, as can the levels beneath. The same principle applies to the bare steel which can be spliced. This technique largely solves the problems of accessibility to cramped areas and the shipping of awkwardly high structures.

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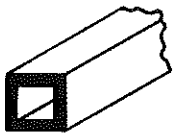
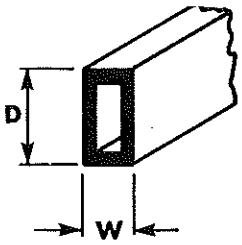


COLOR: CONCRETE GRAY

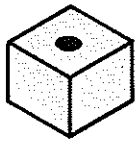
Accurately Extruded
All 30" Lengths
MATERIAL: ABS



FIREPROOF COLUMNS

CODE	ACTUAL SIZE
FPH-4	1/8"
FPH-6	3/16"
FPH-8	1/4"
FPH-10	5/16"
FPH-12	3/8"
FPH-14	7/16"
FPH-16	1/2"
FPH-18	9/16"
FPH-20	5/8"
FPH-24	3/4"
FPH-28	7/8"
FPH-32	1"
FPH-36	1-1/8"
FPH-40	1-1/4"

For larger sizes see following page.



COLUMN BLOCKS

CODE	TO FIT
CB-12	FPH-12
CB-14	FPH-14
CB-16	FPH-16
CB-18	FPH-18
CB-20	FPH-20
CB-24	FPH-24

COLOR: CONCRETE GRAY
Precision Injection Molded
MATERIAL: ABS
NOTE: Hole in column block accomodates SST-832.

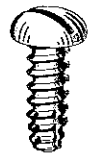
FIREPROOF BEAMS

CODE	ACTUAL SIZE 'D'	ACTUAL SIZE 'W'
FPB-8	1/4"	3/16"
FPB-10	5/16"	1/4"
FPB-12	3/8"	1/4"
FPB-14	7/16"	1/4"
FPB-16	1/2"	1/4"
FPB-18	9/16"	1/4"
FPB-19	9/16"	3/8"
FPB-20	5/8"	1/4"
FPB-21	5/8"	1/2"
FPB-24	3/4"	3/8"
FPB-26	3/4"	9/16"
FPB-28	7/8"	3/8"
FPB-29	7/8"	5/8"
FPB-32	1"	3/8"
FPB-33	1"	3/4"
FPB-36	1-1/8"	3/8"
FPB-37	1-1/8"	3/4"

For larger sizes see following page.

SELF TAPPING SCREWS

CODE	SIZE
SST-440	4-40
SST-832	8-32
SST-1420	1/4-20



To mount small FPH Columns to Base Board:
Either tap thread or use Self Tapping Screws as follows:

FPH-4 USE 1/72-1 Truss Head
FPH-6 USE 4-40
FPH-8 USE 8-32
FPH-10 USE 1/4-20

Provide clearance hole in Base Board.

NOTE: All screws 1" long.

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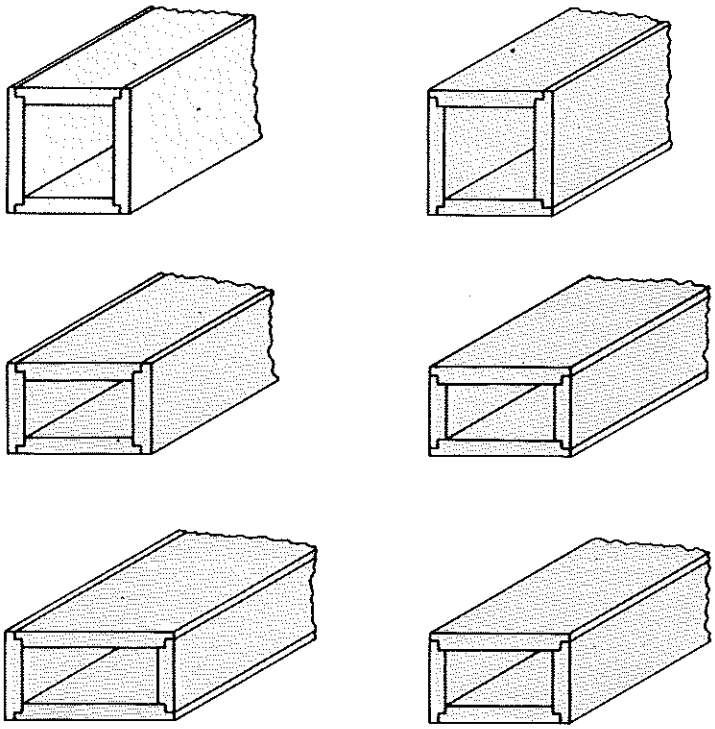
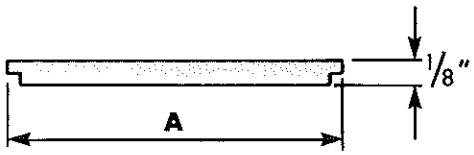




VARIABLE FIREPROOF

CODE	ACTUAL SIZE 'A'
VFP-24	3/4"
VFP-28	7/8"
VFP-32	1"
VFP-36	1-1/8"
VFP-40	1-1/4"
VFP-44	1-3/8"
VFP-48	1-1/2"
VFP-52	1-5/8"
VFP-56	1-3/4"
VFP-60	1-7/8"
VFP-64	2"
VFP-68	2-1/8"

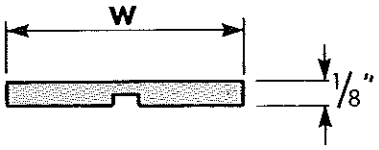
Precision Injection Molded 30" long.
COLOR: Concrete Gray and Clear.
Code shown is for Concrete Gray Color. For Clear add 'C' to end of code. EXAMPLE: VFP-40C.

MATERIAL: ABS

This system, with a minimum number of components, allows the assembly of a nearly infinite assortment of square and rectangular shapes. The design is to provide 90° corners, flat sides and accurate width dimensions. All components are Injection Molded to assure complete dimensional consistency, cutting ease and cementing reliability. Available in Concrete Gray (Fireproof Members) and Clear (Transparent Concrete Sections).

For your convenience, the complete assemblies are stocked in and shipped from Thorofare, New Jersey. Please see our Special Services & Products System pages, 381 thru 386.

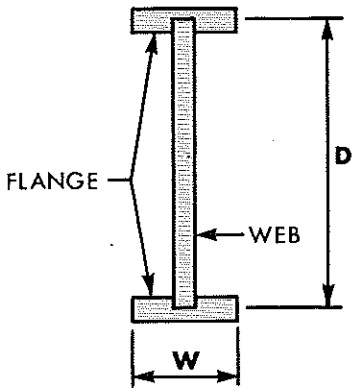
VARIABLE STRUCTURALS

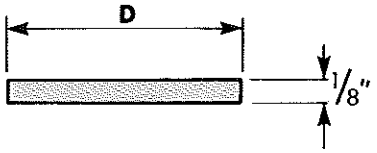


VARIABLE STRUCTURAL FLANGE

CODE	ACTUAL SIZE "W"
SVF-12	3/8"
SVF-14	7/16"
SVF-16	1/2"
SVF-18	9/16"
SVF-20	5/8"
SVF-22	11/16"
SVF-24	3/4"
SVF-28	7/8"
SVF-30	15/16"
SVF-32	1"
SVF-36	1-1/8"
SVF-40	1-1/4"

COLOR: Steel Gray & Clear.
Precision Injection Molded 30" long.
Code shown is for Steel Gray color. For Clear add 'C' to end of code.
EXAMPLE: SVF-30C





VARIABLE STRUCTURAL WEB

CODE	ACTUAL SIZE "D"
SVW-24	3/4"
SVW-28	7/8"
SVW-32	1"
SVW-36	1-1/8"
SVW-40	1-1/4"
SVW-44	1-3/8"
SVW-48	1-1/2"
SVW-52	1-5/8"
SVW-56	1-3/4"
SVW-60	1-7/8"
SVW-64	2"

COLOR: Steel Gray & Clear.
Accurately Extruded 30" long.
Code shown is for Steel Gray color. For Clear add 'C' to end of code.
EXAMPLE: SVW-32C

MATERIAL: ABS

This system is an improvement and expansion over our original Variable Structurals. Now there are 12 different Flange widths and 11 different Web depths available. For greater Web depths, we suggest you cut from SBS-4 (Page 126).

For depth of beam add 1/8" to Web dimension to include Flange slot depth.

For your convenience, the complete assemblies are stocked in and shipped from Thorofare, New Jersey. Please see our Special Services & Products System pages, 381 thru 386.

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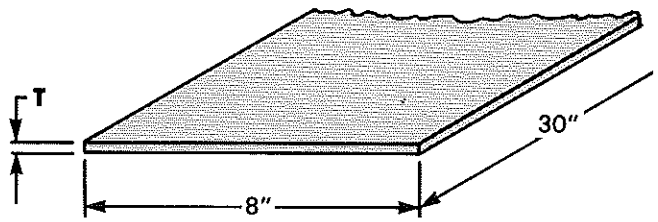


SHEET STOCK

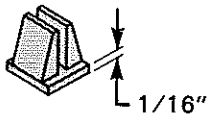
CODE	COLOR	'T'
SFP-2	CONCRETE GRAY	1/16"
SFP-3		3/32"
SFP-4		1/8"
SBS-2	STEEL GRAY	1/16"
SBS-3		3/32"
SBS-4		1/8"

Used for fabrication of special steel or concrete members, trusses and shapes larger than those cataloged. All 8" wide x 30" long. Injection molded to insure accuracy and dependable quality.
MATERIAL: ABS

STRIP STOCK

CODE	COLOR	ACTUAL SIZE
STFP-1	Concrete Gray	.020 thk. x 1-1/4" x 24"
STFP-2	Concrete Gray	1/32" thk. x 1-1/4" x 24"
STBS-1	Steel Gray	.020 thk. x 1-1/4" x 24"
STBS-2	Steel Gray	1/32" thk. x 1-1/4" x 24"

Accurately Extruded MATERIAL: ABS



BASE MOUNTS

CODE *	TO FIT 'H' COLUMNS
BM-4	PSH-4
BM-6	PSH-6
BM-8	PSH-8
BM-10	PSH-10
BM-12	PSH-12 & 14
BM-16	PSH-16 & 18
BM-20	PSH-20 & 24

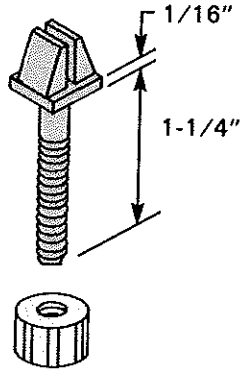
Cut PSH columns 1/16" short to allow for flange thickness of Base Pins & Base Mounts.
BP-4, 6, 8 & 10 require a 13/64" hole in base board and are threaded for plastic nuts.

BP-12, 16 & 20 require a 17/64" hole in base board and are threaded for plastic nuts.

* COLORS: Steel Gray, Clear, Light Blue & Black.
Code shown is for Steel Gray. For other colors, add color designation to end of code.
EXAMPLE: BM-4 LB

C - CLEAR BK - BLACK
LB - LIGHT BLUE

MATERIAL: IMPLEX



BASE PIN SETS

Set consists of Base Pin and Nut

CODE	TO FIT 'H' COLUMNS
BP-4	PSH-4
BP-6	PSH-6
BP-8	PSH-8
BP-10	PSH-10
BP-12	PSH-12 & 14
BP-16	PSH-16 & 18
BP-20	PSH-20 & 24

COLOR: Steel Gray
Precision Injection Molded.

MATERIAL: IMPLEX

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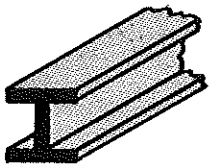
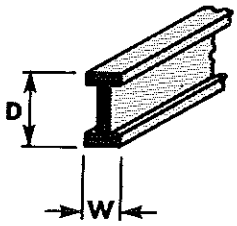
'H' COLUMNS



CODE ✶	ACTUAL SIZE SQUARE	ACTUAL LENGTH
PSH-4	1/8"	24"
PSH-6	3/16"	
PSH-8	1/4"	30"
PSH-10	5/16"	
PSH-12	3/8"	
PSH-14	7/16"	
PSH-16	1/2"	
PSH-18	9/16"	
PSH-20	5/8"	
PSH-24	3/4"	

Precision Injection Molded
MATERIAL: ABS



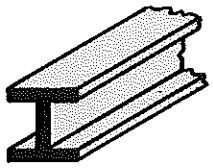
'I' BEAMS

CODE ✶	ACTUAL SIZE 'D'	ACTUAL SIZE 'W'	ACTUAL LENGTH
PSB-4	1/8"	.075	24"
PSB-6	3/16"	3/32"	
PSB-8	1/4"	1/8"	
PSB-10	5/16"	5/32"	
PSB-12	3/8"	3/16"	30"
PSB-14	7/16"	7/32"	
PSB-16	1/2"	1/4"	
PSB-18	9/16"	1/4"	
PSB-20	5/8"	1/4"	
PSB-24	3/4"	5/16"	
PSB-28	7/8"	3/8"	
PSB-32	1"	3/8"	
PSB-36	1-1/8"	1/2"	

✶ COLORS: Steel Gray, Clear, Light Blue & Black.
Code shown is for Steel Gray. For other colors, add color designation to end of code.
EXAMPLE: PSH-16 LB or PSB-12 BK

C - CLEAR BK - BLACK
LB - LIGHT BLUE

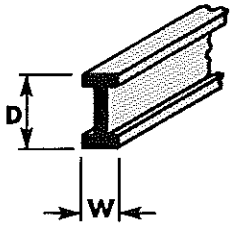
MATERIAL: ABS



ASSEMBLED 'H' COLUMNS

CODE ✶	ACTUAL SIZE SQUARE
SVA-2828	7/8"
SVA-3232	1"
SVA-3636	1-1/8"
SVA-4040	1-1/4"

BOTH ASSEMBLED 'H' COLUMNS AND ASSEMBLED 'I' BEAMS ARE 30" LONG BUT AVAILABLE IN 5' LENGTHS UPON QUOTATION.



ASSEMBLED 'I' BEAMS

CODE ✶	ACTUAL DEPTH 'D'	ACTUAL FLANGE WIDTH
SVA-1240	1-1/4"	3/8"
SVA-1640	1-1/4"	1/2"
SVA-1644	1-3/8"	1/2"
SVA-1844	1-3/8"	9/16"
SVA-1848	1-1/2"	9/16"
SVA-2048	1-1/2"	5/8"
SVA-2052	1-5/8"	5/8"
SVA-2252	1-5/8"	11/16"
SVA-2256	1-3/4"	11/16"
SVA-2456	1-3/4"	3/4"
SVA-2460	1-7/8"	3/4"
SVA-3060	1-7/8"	15/16"
SVA-3064	2"	15/16"

✶ COLORS: Steel Gray and Clear.
Code shown is for Steel Gray color. For Clear, add 'C' to end of code.
EXAMPLE: SVA-3636 C.

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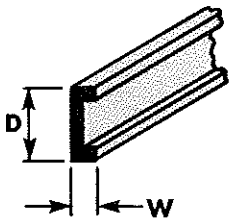
STRUCTURAL SYSTEM

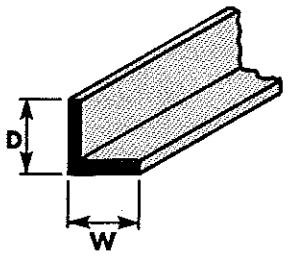


Precision Injection Molded
MATERIAL: ABS

✶ COLORS: Steel Gray, Clear, Light Blue & Black. Code shown is for Steel Gray. For other colors, add color designation to end of code.
EXAMPLE: PSC-4C, PSA-6 BK or PST-6LB
C - CLEAR BK - BLACK
LB - LIGHT BLUE

CHANNELS

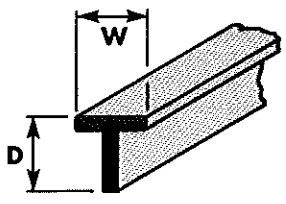
CODE ✶	ACTUAL SIZE 'D'	ACTUAL SIZE 'W'	ACTUAL LENGTH
PSC-4	1/8"	.050	15"
PSC-6	3/16"	1/16"	
PSC-8	1/4"	.070	24"
PSC-10	5/16"	.080	
PSC-12	3/8"	3/32"	30"
PSC-14	7/16"	1/8"	
PSC-16	1/2"	1/8"	
PSC-18	9/16"	1/8"	
PSC-20	5/8"	3/16"	
PSC-24	3/4"	3/16"	



Precision Injection Molded
COLORS: See above.
MATERIAL: ABS

ANGLES

CODE ✶	ACTUAL SIZE 'D' & 'W'	ACTUAL LENGTH
PSA-3	3/32"	15"
PSA-4	1/8"	
PSA-6	3/16"	24"
PSA-8	1/4"	
PSA-10	5/16"	
PSA-12	3/8"	



Precision Injection Molded
COLORS: See above.
MATERIAL: ABS

TEES

CODE ✶	ACTUAL SIZE 'D' & 'W'	ACTUAL LENGTH
PST-3	3/32"	15"
PST-4	1/8"	
PST-6	3/16"	24"
PST-8	1/4"	

For Vessel Platform Materials & Brackets see pages 90, 91 & 92.

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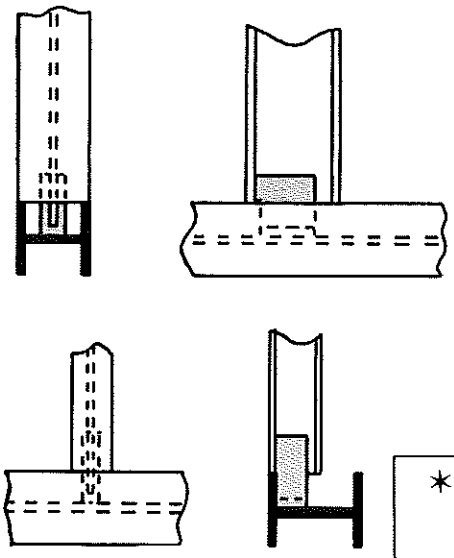


STRUCTURAL CLIPS

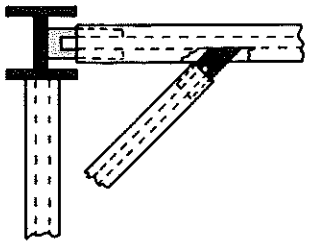
CODE ✶	TO FIT
SAC-2	PSB-10, 12 & 14 PSC-12, 14, 16 & 18
SAC-3	PSB-16, 18, 20 & 24 PSC-20 & 24
SAC-5	PSB-28, 32 & 36

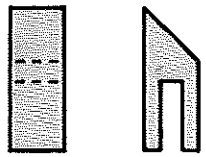
✶ COLORS: Steel Gray, Clear, Light Blue & Black.
Code shown is for Steel Gray. For other colors, add color designation to end of code.
EXAMPLE: SAC-2C or SACA-3BK

C - CLEAR BK - BLACK
LB - LIGHT BLUE

45° STRUCTURAL CLIPS

CODE ✶	TO FIT
SACA-2	PSB-10, 12 & 14 PSC-12, 14, 16 & 18 PSH-8
SACA-3	PSB-16, 18, 20 & 24 PSC-20 & 24



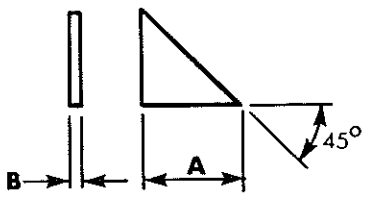


- Clips snap on to end of Beams and Channels to allow rapid assembly of structures without coping or shaping ends.
- Allows greater tolerance for length of member.
- Provides ample surface for bonding.
- Perfect for installing secondary steel.

STRUCTURAL GUSSETS

CODE	ACTUAL SIZE 'A'	ACTUAL SIZE 'B'
SG-8	1/4"	.050
SG-12	3/8"	.0625
SG-16	1/2"	.0625
SG-20	5/8"	.090
SG-24	3/4"	.090
SG-28	7/8"	.125
SG-32	1"	.125

Packaged in bags of 25 pieces.



COLOR: Clear

Precision Injection Molded

MATERIAL: - ACRYLIC

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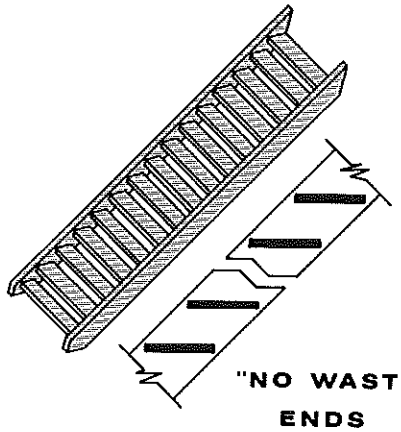


STAIRS

CODE	SCALE	SCALE WIDTH
ST-4	1/8" = 1'–0" (1:96)	2'–6"
ST-6	1/4" = 1'–0" (1:48)	2'–6"
ST-8		3'–0"
ST-12	3/8" = 1'–0" (1:32)	2'–6"
ST-14		3'–0"
ST-16	1/2" = 1'–0" (1:24)	2'–6"
ST-18		3'–0"
ST-20	3/4" = 1'–0" (1:16)	2'–6"
ST-22		3'–0"

COLOR: STEEL GRAY

All Injection Molded 12" long with "No Waste" ends.

ST-4 is 5" long.

MATERIAL: ABS

LADDERS

CODE	SCALE
KL-4	1/8" = 1'-0" (1:96)
KL-8	1/4" = 1'-0" (1:48)
KL-12	3/8" = 1'-0" (1:32)
KL-16	1/2" = 1'-0" (1:24)
KL-24	3/4" = 1'-0" (1:16)

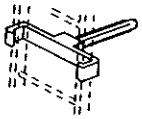
COLOR: STEEL GRAY

All Injection Molded 15" long.

MATERIAL: ABS

KL-4 is 5" long.

See Page 131 for Caged Ladders.



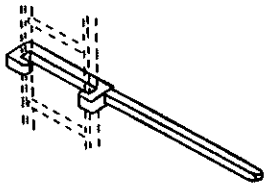
LADDER CLIPS

CODE	TO FIT LADDER	DRILL SIZE	SX SIZE
KLC-8	KL-8	#51	SX-2
KLC-12	KL-12	#43	SX-3
KLC-16	KL-16	#43	SX-3
KLC-24	KL-24	#43	SX-3

COLOR: CLEAR MATERIAL: IMPLEX

The Ladder Clip simplifies the attachment of ladders.

Can be used with SX Fittings — See Page 18



RADIAL LADDER CLIPS

CODE	TO FIT LADDER	DRILL SIZE
KRLC-12	KL-12	3/32"
KRLC-16	KL-16	1/8"
KRLC-24	KL-24	1/8"

COLOR: CLEAR MATERIAL: IMPLEX

Designed for radial configuration.

Clip can be cemented to top of horizontal member or platform, the side of a vertical member or inserted in a drilled hole. Stem of clip is square to allow bonding to flat surfaces.

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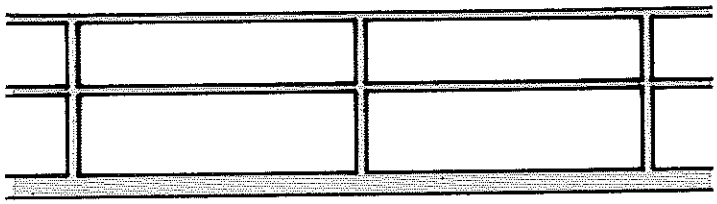
HANDRAILS

CODE ✶	SCALE
● HR-4	1/8" = 1'-0" (1:96)
HR-8	1/4" = 1'-0" (1:48)
HR-12	3/8" = 1'-0" (1:32)
HR-16	1/2" = 1'-0" (1:24)
HR-24	3/4" = 1'-0" (1:16)



✶ COLOR: STEEL GRAY & YELLOW. Code shown is for steel gray. To order in yellow, add 'Y' to end of code. Example: HR-12Y

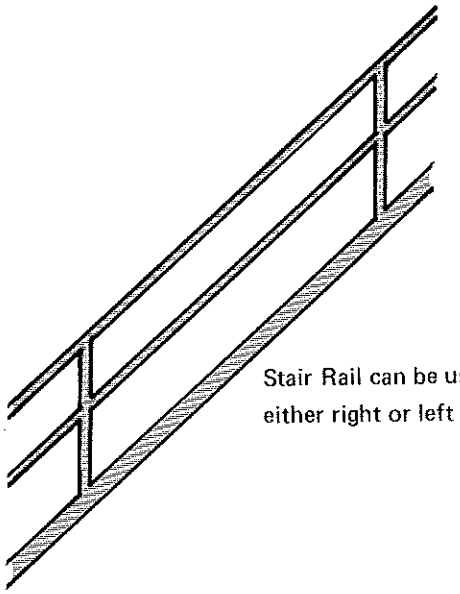
All Injection Molded 24" long

● HR-4 is 6" long and available in steel gray only.

MATERIAL: ABS

STAIR RAILS

CODE ✶	SCALE
● SR-4	1/8" = 1'-0" (1:96)
SR-8	1/4" = 1'-0" (1:48)
SR-12	3/8" = 1'-0" (1:32)
SR-16	1/2" = 1'-0" (1:24)
SR-24	3/4" = 1'-0" (1:16)



Stair Rail can be used for either right or left hand.

✶ COLOR: STEEL GRAY & YELLOW. Code shown is for steel gray. To order in yellow, add 'Y' to end of code. Example: SR-8Y

All Injection Molded 24" long

● SR-4 is 6" long and available in steel gray only.

MATERIAL: ABS

LADDERS WITH CAGES

CODE	SCALE
CL-8	1/4" = 1'-0" (1:48)
CL-12	3/8" = 1'-0" (1:32)
CL-16	1/2" = 1'-0" (1:24)

COLOR: STEEL GRAY

Cages are Injection Molded 12" long and are packaged with ladders.

NOTE: For 3/4" scale cage and ladder use a CL-16 and KL-24.

MATERIAL: ABS

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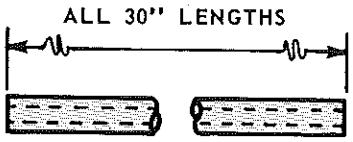
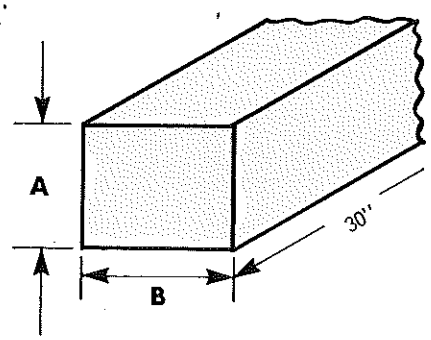


ROUND STEEL TUBING

CODE	ACTUAL SIZE	SCALE SIZE IN INCHES			
		1/4 (1:48)	3/8 (1:32)	1/2 (1:24)	3/4 (1:16)
PSRT-6	3/16"	8 OR 10	6	4	3
PSRT-8	1/4"	12	8	6	4
PSRT-10	5/16"	14 OR 16	10	8	5
PSRT-12	3/8"	18	12	—	6
PSRT-14	7/16"	20	14	10	—
PSRT-16	1/2"	24	16	12	8
PSRT-18	9/16"	28	18	14	—
PSRT-20	5/8"	30	20	16	10
PSRT-24	3/4"	36	24	18	12

COLOR: STEEL GRAY ABS

Accurately Extruded
All 30" Lengths



UNISTRUT

CODE *	ACTUAL DIMENSIONS	
	A	B
USG-4	1/8"	1/8"
USG-8	1/8"	1/4"
USG-12	1/8"	3/8"

ACCURATELY EXTRUDED 30" LONG
MATERIAL: ABS

THESE PRODUCTS HAVE BEEN DEVELOPED TO REPRESENT THE FREQUENTLY USED "UNISTRUT" CONFIGURATIONS.

MODEL TECHNICIANS WILL FIND NUMEROUS OTHER USEFUL APPLICATIONS.

* COLORS: STEEL GRAY AND LIGHT BLUE.

CODE SHOWN IS FOR STEEL GRAY COLOR.
TO ORDER LIGHT BLUE, ADD 'LB' TO END OF CODE.
EXAMPLE: USG-4LB

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ARCHITECTURAL STRUCTURAL SHAPES

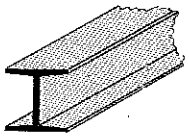
These structural shapes have been especially designed with very thin webs and flanges for use in small scale models. All the sections are injection molded in ABS to the same close tolerances as our regular structural shapes.

COLOR: STEEL GRAY

Precision Injection Molded

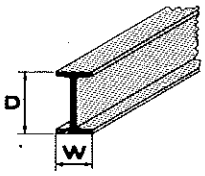
'H' COLUMNS

CODE	ACTUAL SIZE SQUARE	ACTUAL LENGTH
ASH-2	1/16"	10"
ASH-3	3/32"	15"
ASH-4	1/8"	15"



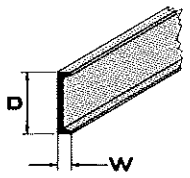
'I' BEAMS

CODE	ACTUAL SIZE 'D'	ACTUAL SIZE 'W'	ACTUAL LENGTH
ASB-2	1/16"	.035"	10"
ASB-3	3/32"	.050"	10"
ASB-4	1/8"	.0625"	15"



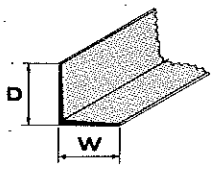
CHANNELS

CODE	ACTUAL SIZE 'D'	ACTUAL SIZE 'W'	ACTUAL LENGTH
ASC-2	1/16"	.035"	10"
ASC-3	3/32"	.040"	10"
ASC-4	1/8"	.050"	15"



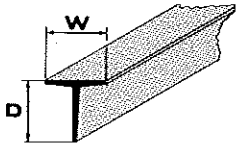
ANGLES

CODE	ACTUAL SIZE 'D' & 'W'	ACTUAL LENGTH
ASA-1	3/64"	10"
ASA-2	1/16"	10"
ASA-3	3/32"	15"
ASA-4	1/8"	15"



TEES

CODE	ACTUAL SIZE 'D' & 'W'	ACTUAL LENGTH
AST-1	3/64"	10"
AST-2	1/16"	10"
AST-3	3/32"	15"
AST-4	1/8"	15"



MATERIAL: ABS

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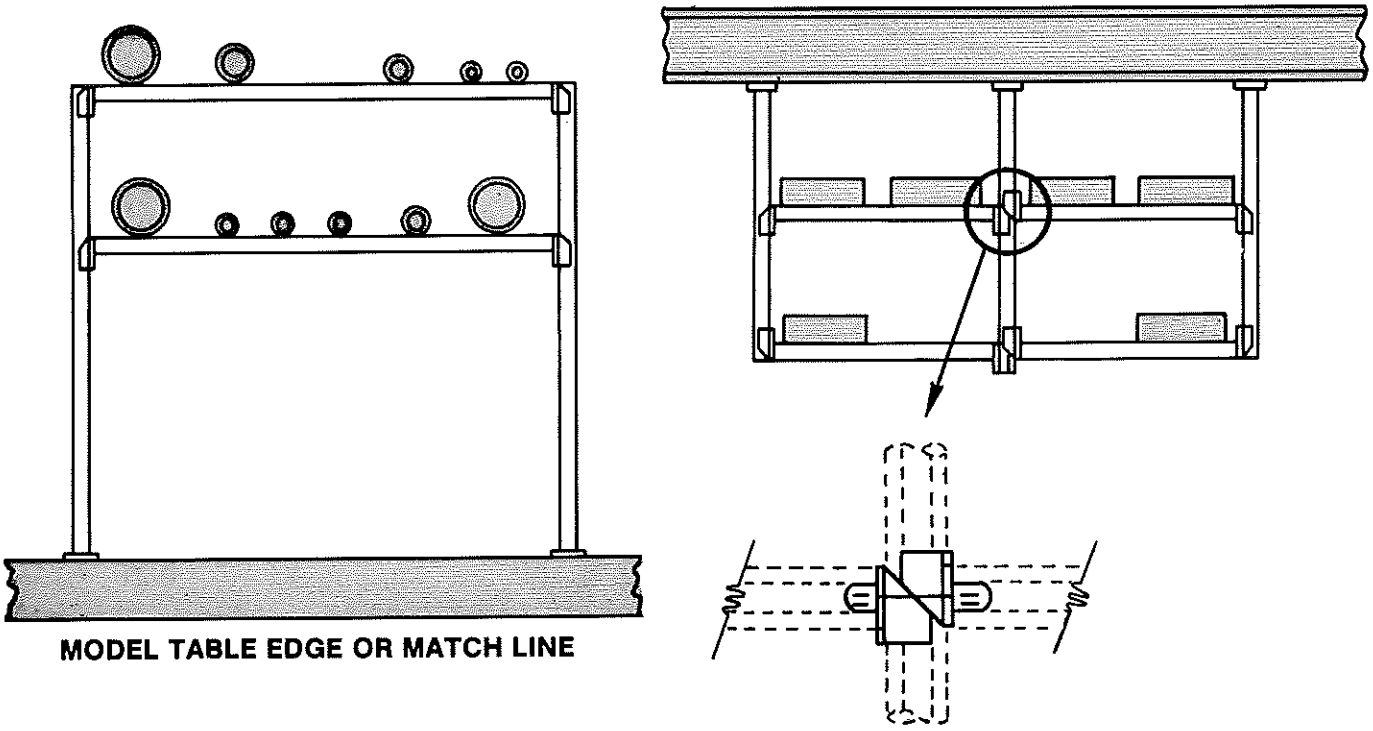
NEXT SYSTEM BEGINS ON PAGE 149.

FICTITIOUS SUPPORT SYSTEM

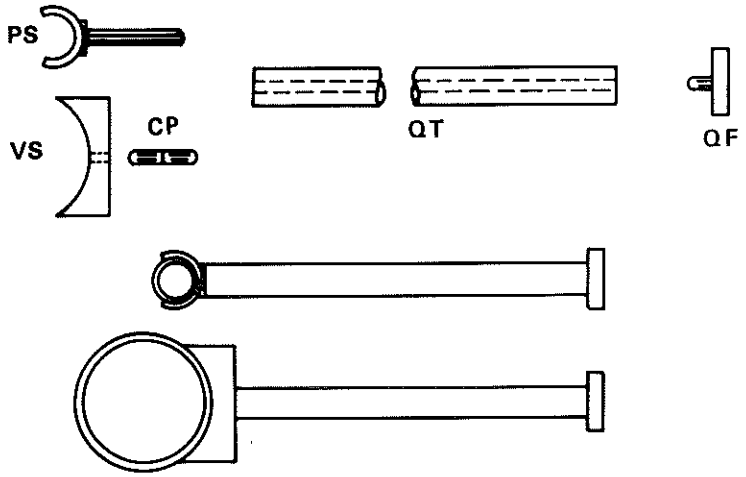
The Fictitious Support System was designed to provide a means for using mechanical supports, hangers and guides for model construction purposes only and not to represent or be confused with actual existing equipment. The entire system is COLORLESS . . . and can simply be designated on the Model Color Code Legend: FICTITIOUS or FOR MODEL PURPOSES ONLY.

SUPPORTING OR HANGING CABLE TRAYS AND DUCTS



MODEL TABLE EDGE OR MATCH LINE

PIPE SUPPORTS OR HANGERS



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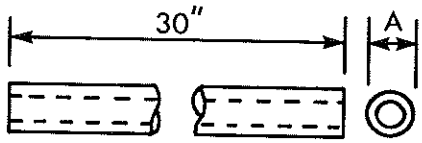
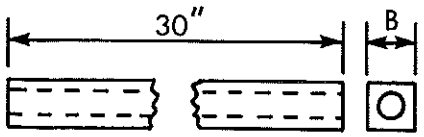
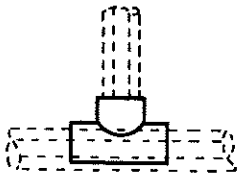
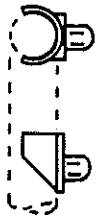
FICTITIOUS SUPPORT SYSTEM





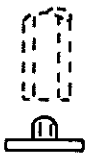


TF-C-3
To Fit QT-3



QC-4, 6 & 8

SX-3 & 4
To Fit QT-3 & QT-4



QF-4, 6 & 8

ROUND TUBE

CODE	ACTUAL SIZE A
QT-3	3/32"
QT-4	1/8"
QT-6	3/16"
QT-8	1/4"

SQUARE TUBE

CODE	ACTUAL SIZE B
QS-4	1/8"
QS-6	3/16"
QS-8	1/4"

CLIPS

CODE	TO FIT QT & QS
TF-C-3	QT-3
QC-4	QT-4 & QS-4
QC-6	QT-6 & QS-6
QC-8	QT-8 & QS-8

SUPPORT FLANGES

CODE	TO FIT
SX-3	QT-3
SX-4	QT-4
QF-4	QT-4
QF-6	QT-6
QF-8	QT-8

MATERIAL: ALL CLEAR ACRYLIC

SEE PAGE 149 FOR TYPICAL APPLICATIONS

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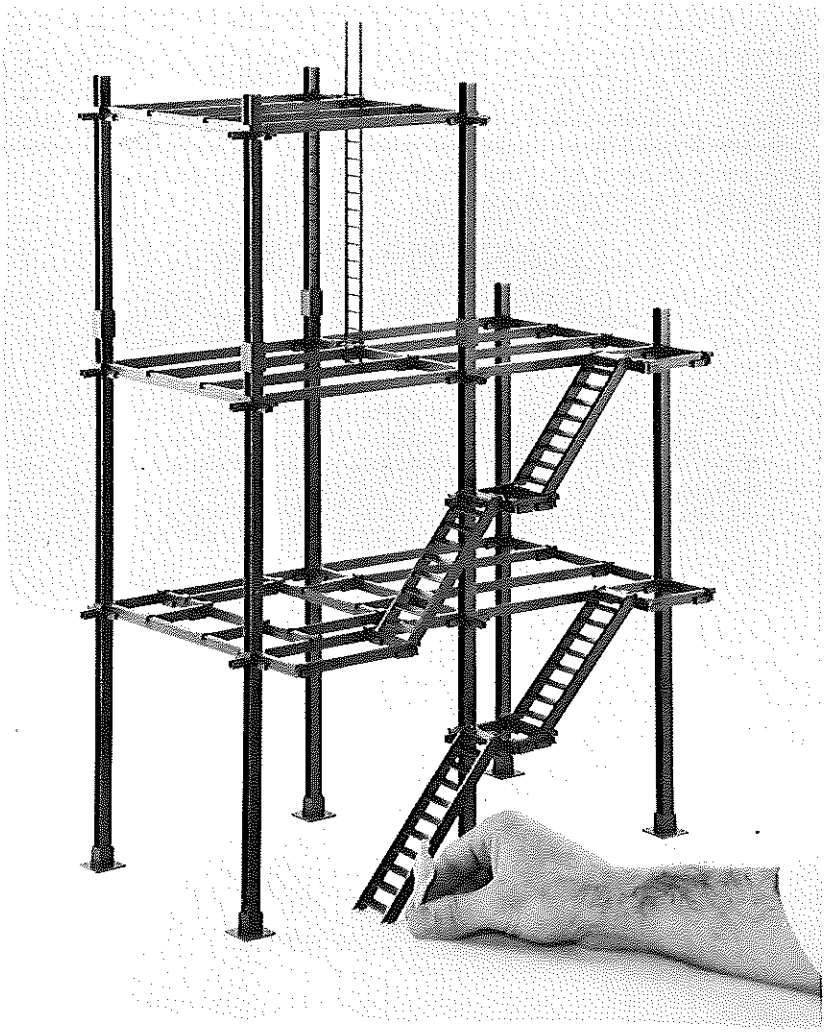

This Preliminary Structural System is presented to facilitate the structural arrangement and the layout of equipment in the preliminary stages of plant design. It provides a means for "three dimensional sketches" of proposed arrangements that can speedily be altered or revised as improved ideas present themselves. Column spacing and beam elevations and locations are easily changed —— with no tools and no requirements for practice or skill. Space relationships, accessibility, mechanical flow and support are immediately obvious —— and optimum arrangements are achieved in minimum time. The System is designed to provide complete flexibility and is presented solely as a "design tool" —— a method of thinking and planning in three dimensions.

This System is manufactured of the same plastic material as our standard Structural System; many of the parts of the two Systems are interchangeable. There is no waste —— when design is finalized the structure is disassembled and the parts stored for the next use.

All parts are injection molded —— for utmost accuracy and strength. Column and beam sizes were selected as appropriate for the preliminary planning stage and should not be considered as representing the actual structural sizes.

The System is designed for those scales commonly used in industrial plant design.

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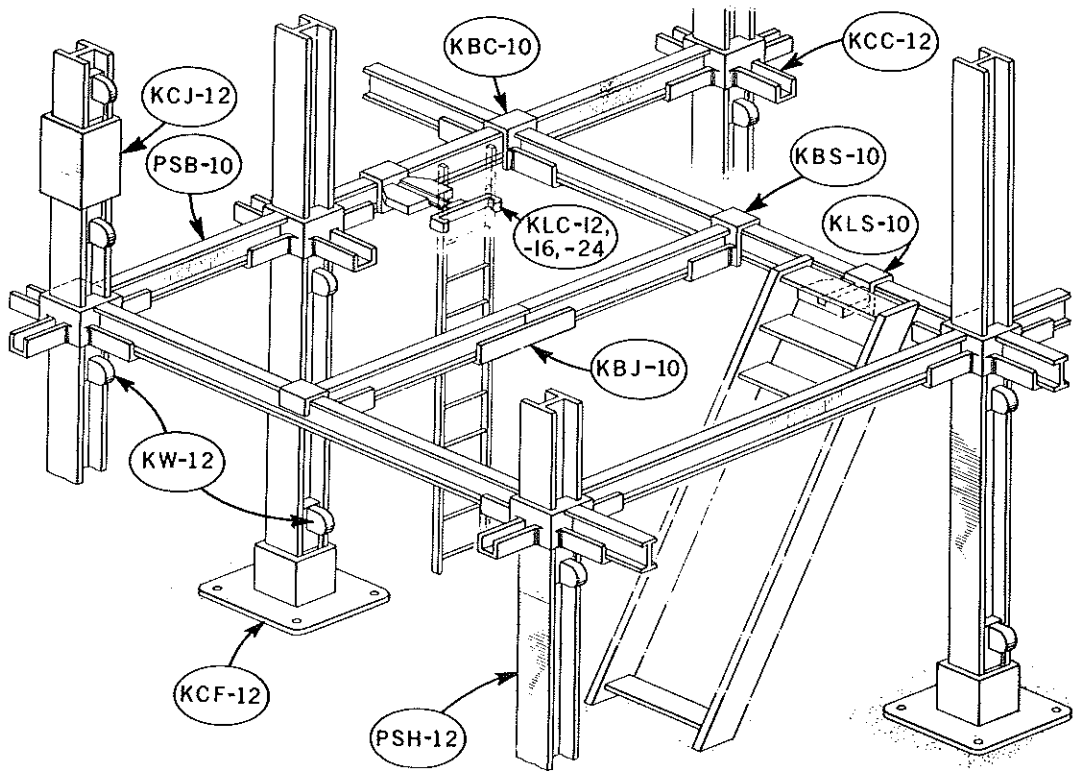
PRELIMINARY STRUCTURAL SYSTEM

The E.M.A. Kit has been assembled to enable designers to become acquainted with the E.M.A. Preliminary Structural System and at the same time provide sufficient quantities of the various parts to accomplish a large variety of project designs. The materials in this Kit are sufficient to set up a 30 to 40 bay structure. Scale figures, ladders, stairs and scale rules are included in the Kit. The Kit price represents a substantial saving over purchase of the individual parts and saves ordering time. Part quantities are in relation to average usage in a typical structure.

KITS PARTS LIST

DESCRIPTION	CODE	QUANTITY	DESCRIPTION	CODE	QUANTITY
'H' Column	PSH-12	20	Ladder Support	KLS-10	20
Column Footer	KCF-12	20	Ladder Clip		10
Beam	PSB-10	40	Ladder		5
Column Cross	KCC-12	50	Stairs	Size	5
Wedge	KW-12	100	Standing Figure	According	2
Column Splice	KCJ-12	10	Reaching Figure	To Kit	2
Beam Cross	KBC-10	40	12" Scale Rule	Scale	1
Beam Support	KBS-10	36	6" Scale Rule		1
Beam Splice	KBJ-10	10	Zona Saw	ZS-300	1

CODE	SCALE
K-29	1/4" = 1'-0" (1:48)
K-30	3/8" = 1'-0" (1:32)
K-31	1/2" = 1'-0" (1:24)
K-32	3/4" = 1'-0" (1:16)



ASSEMBLY DETAILS

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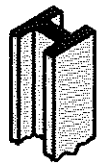
PRELIMINARY STRUCTURAL SYSTEM

CODE

PSH-12

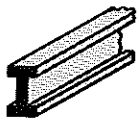
The Column is 3/8" x 3/8" x 30" long.
See Page 127



COLUMN

PSB-10

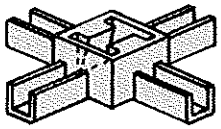
The Beam is 5/16" deep x 5/32" wide x 24" long.
See Page 127



BEAM

KCC-12

The Column Cross fits the Column PSH-12; the Arms securely hold Beam PSB-10. One KW-12 is required for locking in place. Unused Beam Arms on corner locations may be left or easily snipped off.



COLUMN CROSS

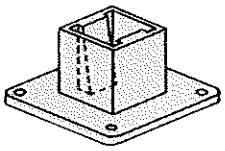
KW-12

The Wedge is required to lock KCC-12, KCF-12, and KCJ-12.

WEDGE

KCF-12

The Column Footer provides a firm support for Column PSH-12. May be temporarily positioned with double-faced tape. One KW-12 is required to lock with Column.



COLUMN FOOTER

COLOR: Steel Gray
MATERIAL: ABS

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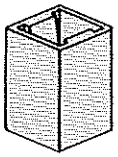
PRELIMINARY STRUCTURAL SYSTEM

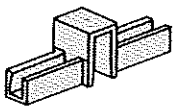


COLUMN SPLICE

CODE

KCJ-12

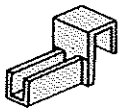
Each end of the Column Splice slips over Column PSH-12. Allows levels to be added or to be removed to view lower floors. One or two KW-12 may be required to lock in place.



BEAM CROSS

KBC-10

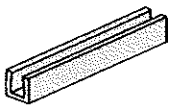
The Beam Cross fits Beam PSB-10. It snaps over primary steel beams to allow secure installation of secondary members.



BEAM SUPPORT

KBS-10

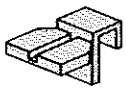
The Beam Support fits Beam PSB-10. It snaps over beams to allow additional beam framing.



BEAM SPLICE

KBJ-10

The Beam Splice joins two Beams PSB-10. Beams are held firmly and in line.



LADDER SUPPORT

KLS-10

The Ladder Support snaps over Beam PSB-10 for attaching a ladder or a stair.

COLOR: Steel Gray
MATERIAL: ABS

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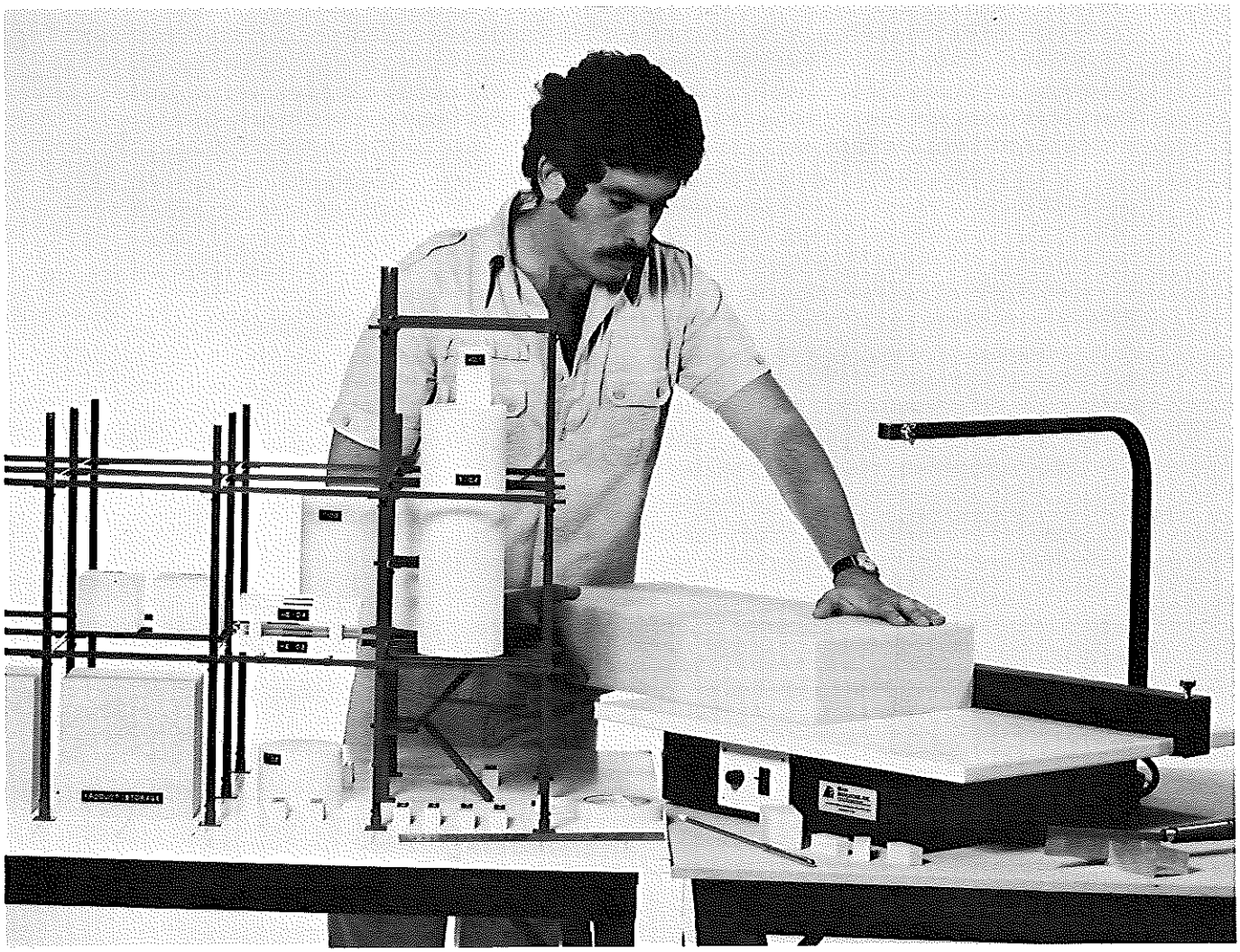
PROJECT PLANNING SYSTEM



Simple. Flexible. Reusable. The EMA Project Planning System is an indispensable aid to the first stages of project development. Its easily maneuvered three-dimensional components enable project teams to arrive at an optimum basic plant configuration through face-to-face discussions over an inexpensive model, rather than time-consuming, often vague general arrangement drawings.

The EMA Project Planning System facilitates the assembly of a Study Model for the layout and equipment arrangement of any size processing, storage or manufacturing project. It permits all disciplines to contribute ideas and suggestions at the beginning of the project. Moreover, the three-dimensional format promotes early consideration of process flow, equipment accessibility and maintenance, safety and traffic.

The Project Planning System is equally applicable to the revamping and expansion of existing facilities. It is an invaluable tool for teaching plant design, and communicating plant design concepts. It is simple, practical and economical and is a proven design medium.

Two kits are available or you may purchase the components separately. See the following page.

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PROJECT PLANNING SYSTEM

PROJECT PLANNING SYSTEM KIT

The kit consists of:

Preliminary Structural Kit — An assortment of plastic structural components and fittings for the assembly of three-dimensional sketches of proposed arrangements. These can be quickly altered or revised to illustrate different design concepts. For instance, column spacing and beam elevations are easily changed—with no tools or requirements of practice or skill. Materials in this kit are sufficient to set up a 30 to 40-bay structure. There is no waste. When design is finalized, the structure is disassembled and the parts stored for the next use. All parts are injection molded for maximum accuracy and strength. Column and beam sizes were selected as appropriate for the project planning stage and should not be considered as representing the actual structural sizes. Scale figures, ladders, stairs and scale rules are included in the kit. (See pages 159-162)

Styrofoam—Three blocks 12 x 24 x 4 inches provide adequate material to produce various configurations of equipment normally required in a typical project. Vessels, pumps, exchangers and other equipment are formed in Styrofoam in simple but reasonably recognizable shapes to indicate the space to be occupied by a particular item. The foam is 2# density, light blue color, safe and clean. It leaves no dust from cutting and presents no hazard from toxic fumes with normal ventilation. (See page 180)

Double-faced Scotch Transparent Tape—108 feet of ¾-inch tape for mounting equipment and structures to layout table. (See page 303)

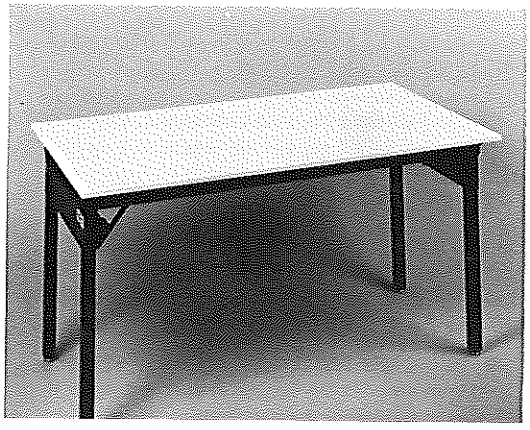
Mitre Box and Zona Saw—For cutting various structural columns and beams to required length. (See page 307)

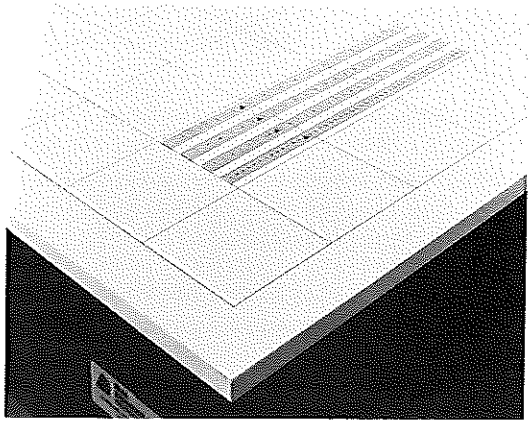
Telescoping Pocket Pen Pointer—Perfect for model reviews on the design floor. Extends from 5 to 24 inches. Plastic cap protects pen point. (See page 303)

Dymo Tape Writers and Tape—(optional) Available for tagging and labeling equipment pieces. (See page 249)

Hot Wire Foam Cutter—See following page.

Layout Table—Standard 30 x 60-inch EMA model table with metal folding legs and welded tubular steel grid platen. White formica-surfaced table top with printed locating grid lines on 3¾-inch centers (15 feet in ¼-inch scale, 10 feet in ⅜-inch scale) allows maintaining of dimensions when butting additional tables. Color permits contrast in reference photographs.





CODE: PMT-1

KIT CODE	KIT SCALE
PPSK-8	¼" = 1'-0" (1:48)
PPSK-12	⅜" = 1'-0" (1:32)

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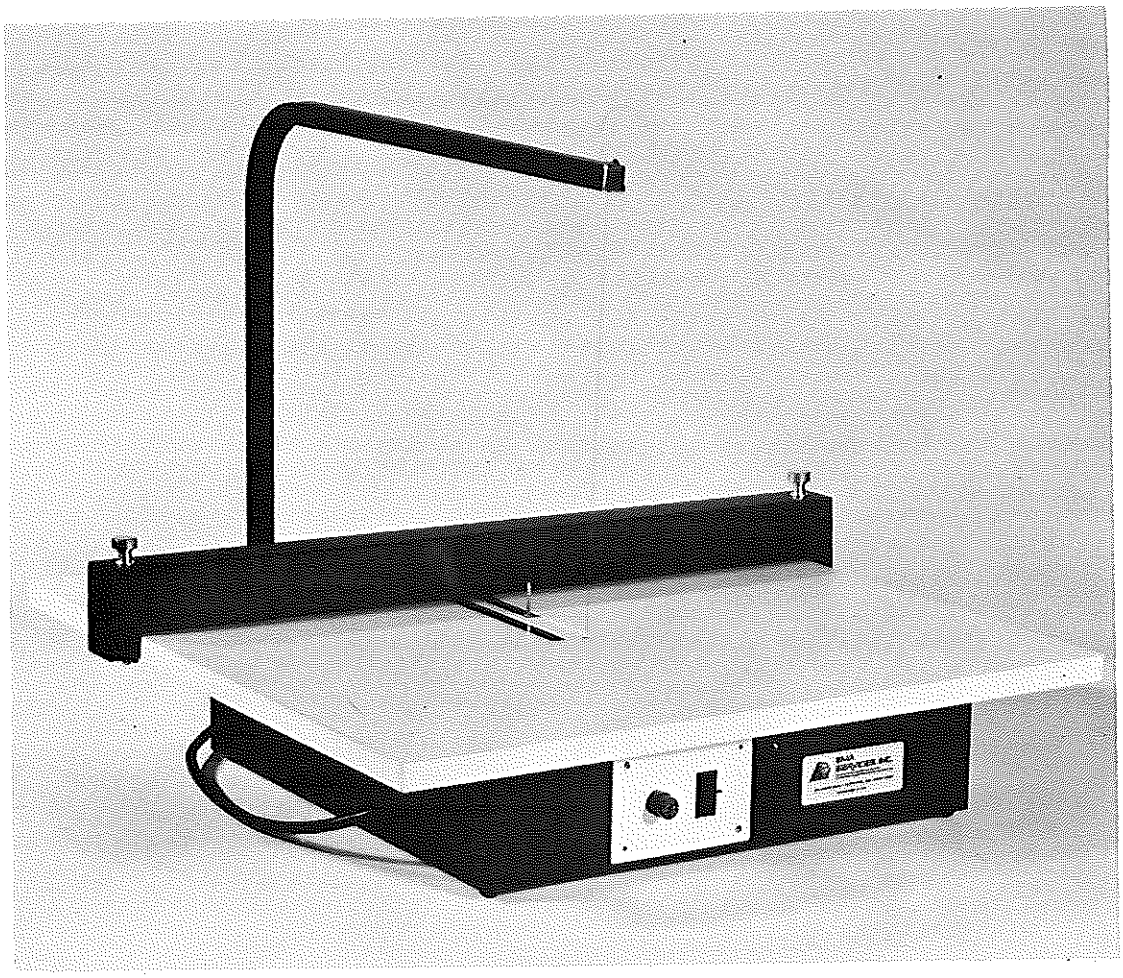
HOT WIRE FOAM CUTTER



Specially designed and built by E.M.A. to cut styrofoam efficiently, quietly and safely by means of an electrically-heated wire. Virtually any shape can be formed from styrofoam. Large pieces of equipment can be fabricated in parts and joined together.

Working surface of table top is 23" x 23". Arm height allows cutting blocks up to 12 " thick.

The cutting wire is adjustable from 90° to 45° to accommodate a variety of shapes. An adjustable fence and a pivot pin are also provided to aid in the cutting of rounds and cones. A groove cut in the table top is designed to hold a scale for dimensioning.

CODE: HWC-2

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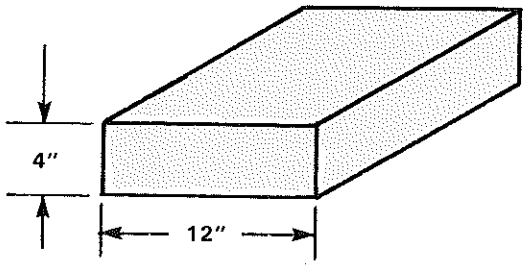
STYROFOAM AND ACCESSORIES

BLOCKS

Light blue 2# density styrofoam available in two sizes. Clean and safe to use, does not generate dust or hazardous toxic fumes from cutting.

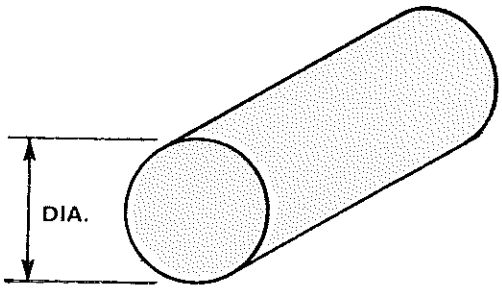
CODE	SIZE
STY-2	3 Pcs. 4" x 12" x 24"
STY-3	3 Pcs. 4" x 12" x 36"



VESSELS

Styrofoam rounds cut from the above material in 24" lengths.

CODE	DIAMETER
STYV-32	1"
STYV-40	1¼"
STYV-150	1½"
STYV-200	2"
STYV-250	2½"
STYV-300	3"
STYV-350	3½"
STYV-400	4"
STYV-500	5"
STYV-600	6"

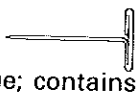


ATTACHMENT DEVICES

Permanent

Spray adhesives are available, or Elmers Glue.
We suggest 3M Brand Spray Adhesive #77.

Temporary

Steel T-Pins 2" long 
Boxed in 1/2 lb. package; contains approximately 375 pieces.

CODE: STYP-200

REPLACEMENT WIRE

10 Feet of Nichrome Wire #27 — **CODE:** HWCW-1
10 Feet of Nichrome Wire #29 — **CODE:** HWCW-2

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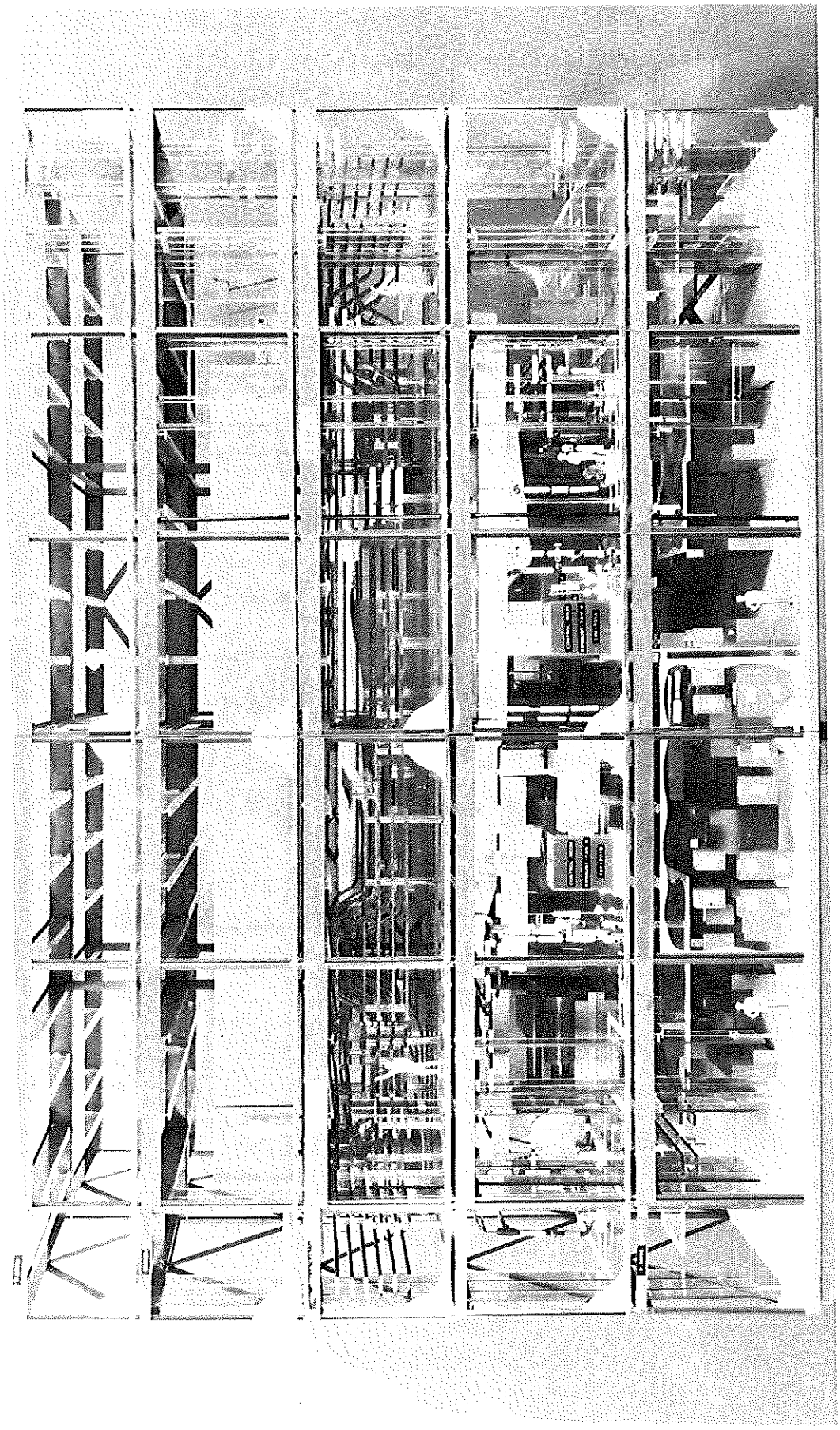


PHOTO COURTESY BECHTEL POWER CORP., SAN FRANCISCO, CA

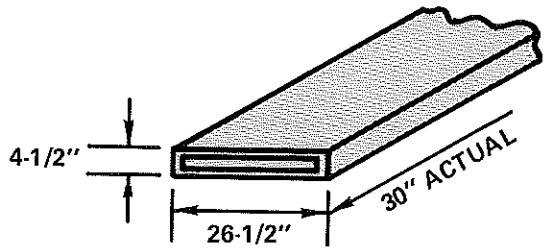
CABLE TRAY & FITTINGS

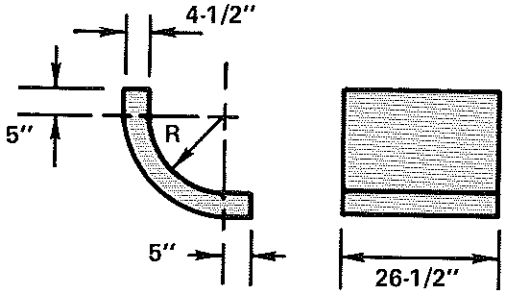
3/8" = 1'-0" (1:32)

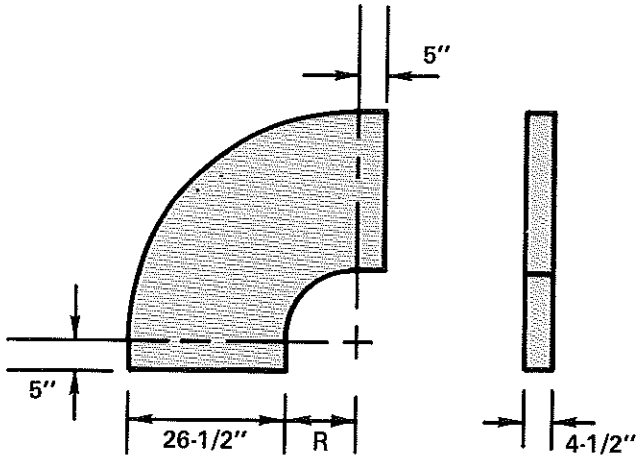
CABLE TRAY

CODE: ET-26

Precision Extruded ABS Plastic
COLOR: Electrical Green
Note: When using the Clear Vertical & Horizontal Bend Fittings, 1/8" Clear Plexiglas may be substituted for the Green Electrical Tray.







VERTICAL BENDS

CODE	'R' RADIUS
EVB-12	12"
EVB-24	24"

HORIZONTAL BENDS

CODE	'R' RADIUS
EHB-12	12"
EHB-24	24"

COLOR: Electrical Green or Clear Acrylic.

Code shown is for Electrical Green color. For Clear add 'C' to end of code.

EXAMPLE: EHB-24C

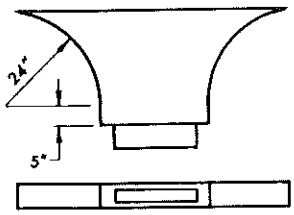
Fittings may be cut any angle desired.
All Dimensions are 3/8" = 1'-0"

See Fictitious Support System pages 149 & 150

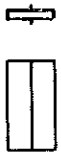
CABLE TRAY & FITTINGS

3/8" = 1'-0" (1:32)

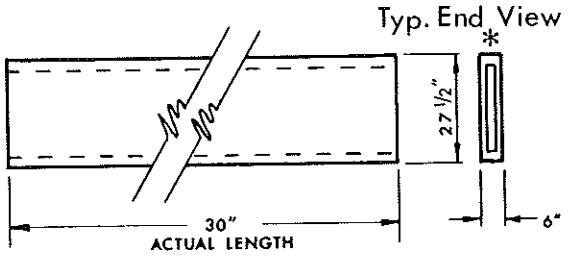
24" RADIUS



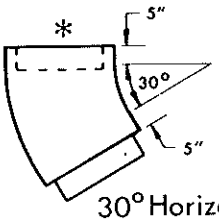
Tee Connection



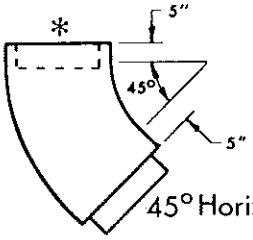
Coupling Piece



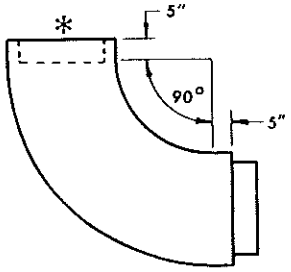
Cable Tray



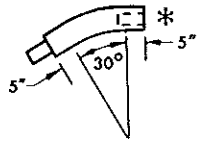
30° Horizontal Bend



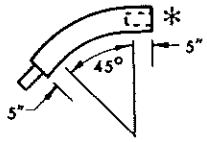
45° Horizontal Bend



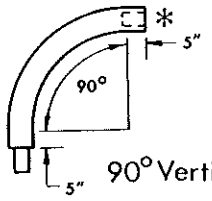
90° Horizontal Bend



30° Vertical Bend



45° Vertical Bend



90° Vertical Bend

CABLE TRAY & 24" RADIUS FITTINGS

DESCRIPTION	CODE
Cable Tray	CT-C-12
Coupling Piece	EC-C-12
90° Horizontal Bend	EHL-C-1290
45° Horizontal Bend	EHL-C-1245
30° Horizontal Bend	EHL-C-1230
90° Vertical Bend	EVL-C-1290
45° Vertical Bend	EVL-C-1245
30° Vertical Bend	EVL-C-1230
Tee Connection	ETL-C-12

All fittings Precision Injection Molded.
Cable Tray Accurately Extruded.

Available in Clear only.

NOTE:
Actual cross section dimensions of tray are 3/16" x 7/8" and may be used in other scales for appropriate sizes. Actual radius of fittings is 3/4".

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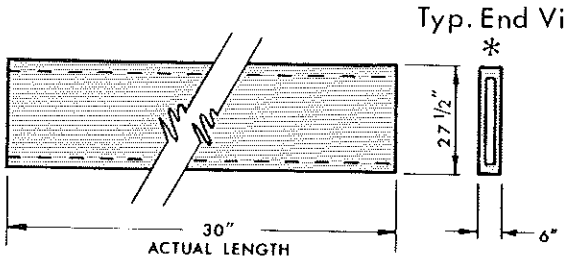
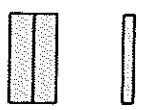
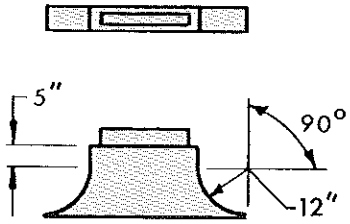
CABLE TRAY & FITTINGS
1/2" = 1'-0" SCALE (1:24)
12" RADIUS

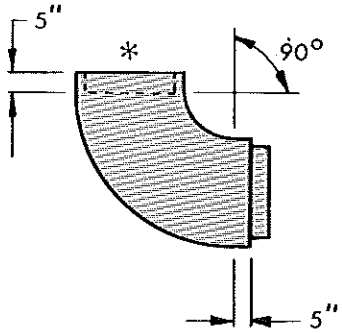


Cable Tray

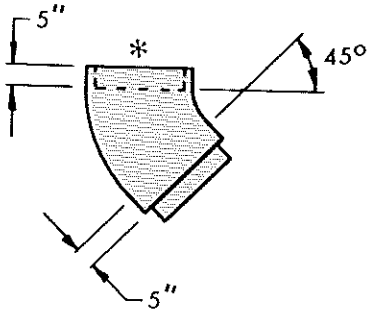

Coupling Piece



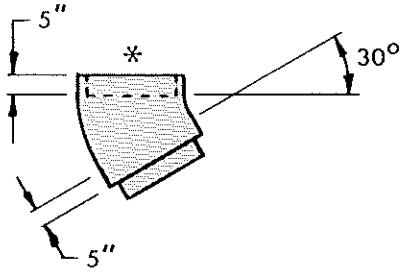
Tee Connection



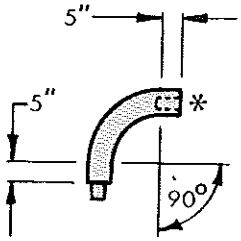
90° Horizontal Bend



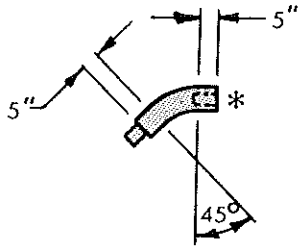
45° Horizontal Bend



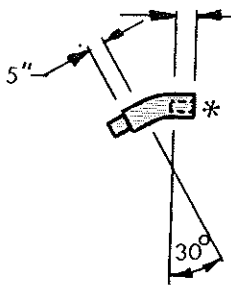
30° Horizontal Bend



90° Vertical Bend



45° Vertical Bend



30° Vertical Bend

*COLORS:
EG-Electrical Green
TG-Translucent Green
C-Clear
All fittings Precision Injection Molded.
Cable Tray Accurately Extruded.

NOTE: Actual cross section dimensions of tray are 1/4" x 1-5/32" and may be used in other scales for appropriate sizes. Actual radius of fittings is 1/2".

CABLE TRAY & 12" RADIUS FITTINGS

DESCRIPTION	CODE *
Cable Tray	CT-( )-16
Coupling Piece	EC-( )-16
90° Horizontal Bend	EHS-( )-1690
45° Horizontal Bend	EHS-( )-1645
30° Horizontal Bends	EHS-( )-1630
90° Vertical Bend	EVS-( )-1690
45° Vertical Bend	EVS-( )-1645
30° Vertical Bend	EVS-( )-1630
Tee Connection	ETS-( )-16

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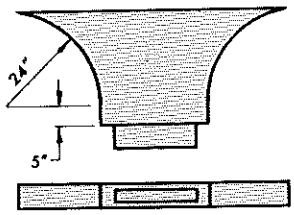
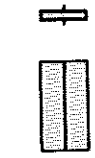
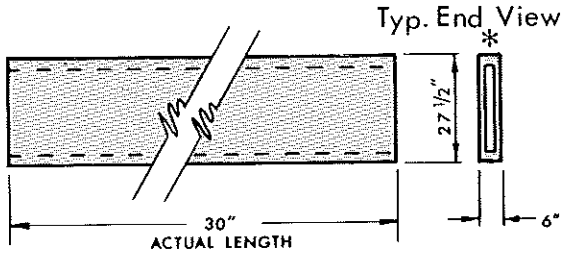
CABLE TRAY & FITTINGS
1/2" = 1'-0" SCALE (1:24)
24" RADIUS

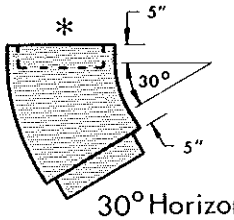


Tee Connection

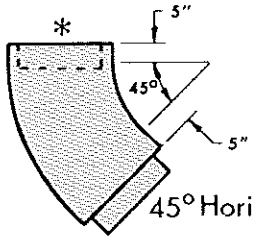

Coupling Piece



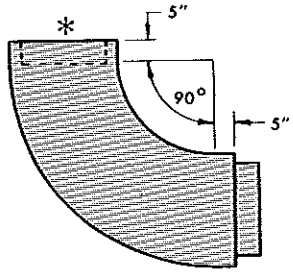
Cable Tray



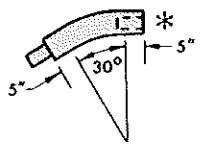
30° Horizontal Bend



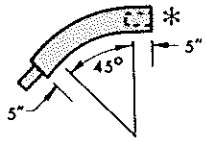
45° Horizontal Bend



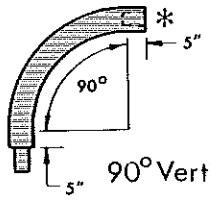
90° Horizontal Bend



30° Vertical Bend



45° Vertical Bend



90° Vertical Bend

CABLE TRAY & 24" RADIUS FITTINGS

DESCRIPTION	CODE *
Cable Tray	CT-( )-16
Coupling Piece	EC-( )-16
90° Horizontal Bend	EHL-( )-1690
45° Horizontal Bend	EHL-( )-1645
30° Horizontal Bend	EHL-( )-1630
90° Vertical Bend	EVL-( )-1690
45° Vertical Bend	EVL-( )-1645
30° Vertical Bend	EVL-( )-1630
Tee Connection	ETL-( )-16

*COLORS:
EG-Electrical Green
TG-Translucent Green
C-Clear

All fittings Precision Injection Molded.
Cable Tray Accurately Extruded.

NOTE: Actual cross section dimensions of tray are 1/4" x 1-5/32" and may be used in other scales for appropriate sizes. Actual radius of fittings is 1".

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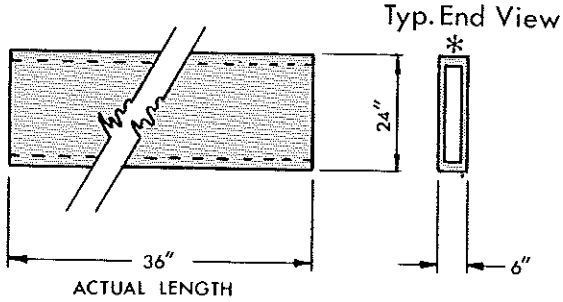
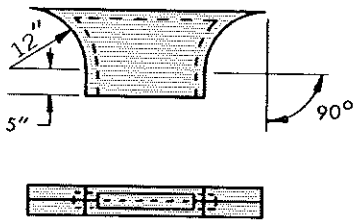
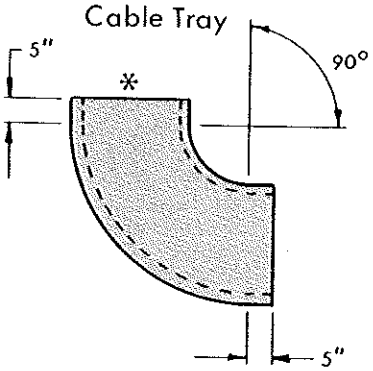
CABLE TRAY & FITTINGS
3/4" = 1'-0" SCALE (1:16)
12" RADIUS



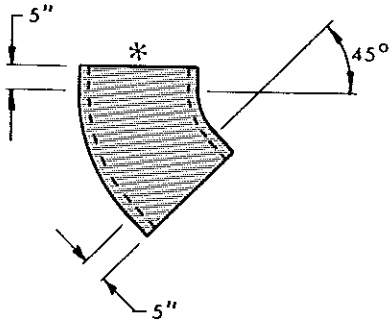


Tee Connection

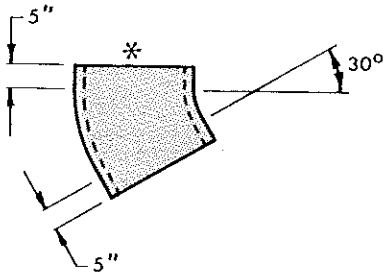
Cable Tray



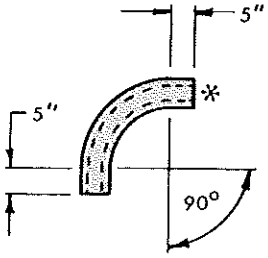
90° Horizontal Bend



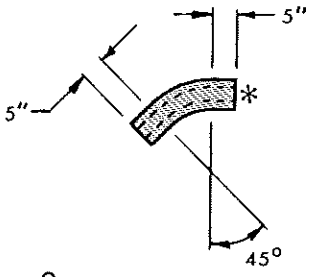
45° Horizontal Bend



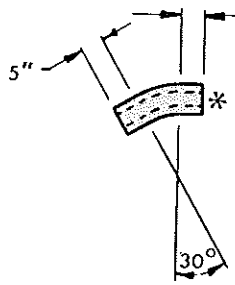
30° Horizontal Bend



90° Vertical Bend



45° Vertical Bend



30° Vertical Bend

✶COLORS:
EG-Electrical Green
TG-Translucent Green
C-Clear

All fittings Precision Injection Molded.
Cable Tray Accurately Extruded.

All Parts Require EC-( )-24 for Connection.
All Pieces other than EC-( )-24 & CT-( )-24 are molded in halves and snap together.
Prices Include Assembly.

NOTE: Actual cross section dimensions of tray are 3/8" x 1-1/2" and may be used in other scales for appropriate sizes. Actual radius of fittings is 3/4".

CABLE TRAY & 12" RADIUS FITTINGS

DESCRIPTION	CODE ✶
Cable Tray	CT-( )-24
Coupling Piece	EC-( )-24
90° Horizontal Bend	EHS-( )-2490
45° Horizontal Bend	EHS-( )-2445
30° Horizontal Bend	EHS-( )-2430
90° Vertical Bend	EVS-( )-2490
45° Vertical Bend	EVS-( )-2445
30° Vertical Bend	EVS-( )-2430
Tee Connection	ETS-( )-24

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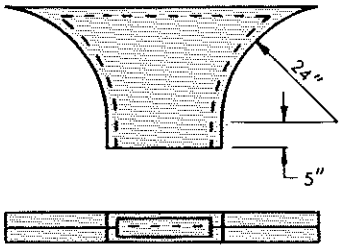
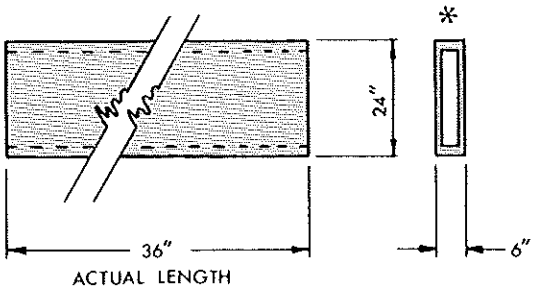
CABLE TRAY & FITTINGS
3/4" = 1'-0" SCALE (1:16)
24" RADIUS



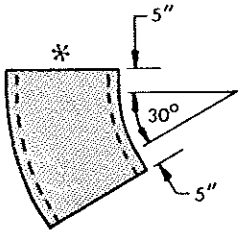
Tee Connection

Coupling Piece

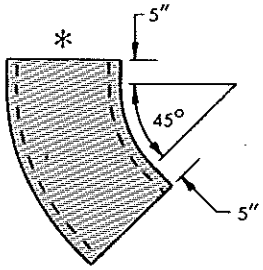
Typ. End View



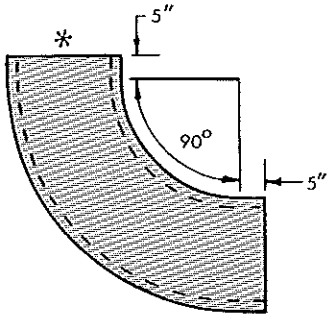
Cable Tray



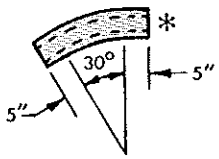
30° Horizontal Bend



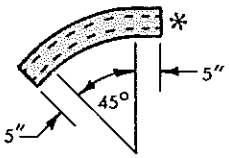
45° Horizontal Bend



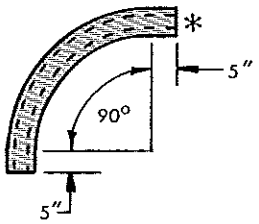
90° Horizontal Bend



30° Vertical Bend



45° Vertical Bend



90° Vertical Bend

CABLE TRAY & 24" RADIUS FITTINGS

DESCRIPTION	CODE *
Cable Tray	CT-( )-24
Coupling Piece	EC-( )-24
90° Horizontal Bend	EHL-( )-2490
45° Horizontal Bend	EHL-( )-2445
30° Horizontal Bend	EHL-( )-2430
90° Vertical Bend	EVL-( )-2490
45° Vertical Bend	EVL-( )-2445
30° Vertical Bend	EVL-( )-2430
Tee Connection	ETL-( )-24

*COLORS:
EG-Electrical Green
TG-Translucent Green
C-Clear

All fittings Precision Injection Molded. Cable Tray Accurately Extruded.

All parts require EC-( )-24 for connection. All pieces other than EC-( )-24 & CT-( )-24 are molded in halves and snap together. Prices Include Assembly.

NOTE: Actual cross section dimensions of tray are 3/8" x 1-1/2" and may be used in other scales for appropriate sizes. Actual radius of fittings is 1-1/2".

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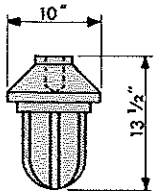
LIGHT FIXTURES

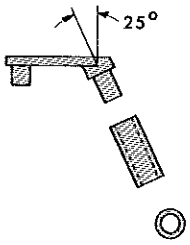
CODE	SCALE	STANCHION PIPE SIZE
LF-8	1/4" = 1'-0" (1:48)	P-( )-2
LF-12	3/8" = 1'-0" (1:32)	P-( )-2
LF-16	1/2" = 1'-0" (1:24)	P-( )-3
LF-24	3/4" = 1'-0" (1:16)	P-( )-3

NOTE: These parts may be used to indicate EYE-WASH & SAFETY SHOWERS.
Code Formerly KLF



INCANDESCENT LIGHT FIXTURES

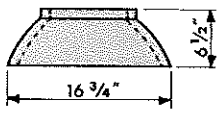
CODE	SCALE	STANCHION PIPE SIZE
LFL-12	3/8" = 1'-0" (1:32)	P-( )-2
LFL-16	1/2"" = 1'-0" (1:24)	P-( )-3
LFL-24	3/4"" = 1'-0" (1:16)	P-( )-4



BRACKET & COUPLING SET

CODE	SCALE	STANCHION PIPE SIZE
LFBC-12	3/8" = 1'-0" (1:32)	P-( )-2
LFBC-16	1/2" = 1'-0" (1:24)	P-( )-3
LFBC-24	3/4" = 1'-0" (1:16)	P-( )-4

Packaged in sets of 10 brackets with couplers.



LAMP REFLECTOR

CODE	SCALE	TO WORK WITH
LFS-12	3/8" = 1'-0" (1:32)	LFHG & LFL
LFS-16	1/2" = 1'-0" (1:24)	LFHG & LFL
LFS-24	3/4" = 1'-0" (1:16)	LFHG & LFL

Lamp Shades Used Only For Ceiling or Overhead Applications Not Involving Stanchions.
See Page 6 (Pipe) & Page 18 (SX) For Stanchions.

COLOR: Electrical Green
All Injection Molded

MATERIAL: ABS

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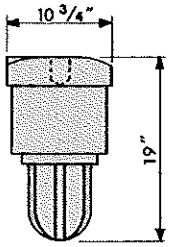
MERCURY VAPOR LIGHTS

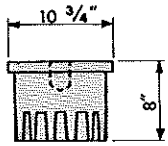
HAZARD GUARD

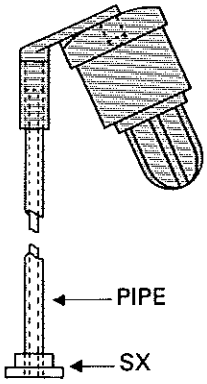
CODE	SCALE	STANCHION PIPE SIZE
LFHG-12	3/8" = 1'-0" (1:32)	P-( )-2
LFHG-16	1/2" = 1'-0" (1:24)	P-( )-3
LFHG-24	3/4" = 1'-0" (1:16)	P-( )-4



RE-LAMP CHAMP

CODE	SCALE	STANCHION PIPE SIZE
LFRC—12	3/8" = 1'-0" (1:32)	P-( )-2
LFRC—16	1/2" = 1'-0" (1:24)	P-( )-3
LFRC—24	3/4" = 1'-0" (1:16)	P-( )-4

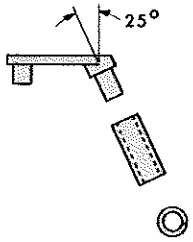




BRACKET & COUPLING SET

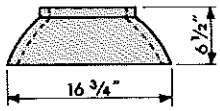
CODE	SCALE	STANCHION PIPE SIZE
LFBC-12	3/8" = 1'-0" (1:32)	P-( )-2
LFBC-16	1/2" = 1'-0" (1:24)	P-( )-3
LFBC-24	3/4" = 1'-0" (1:16)	P-( )-4

Packaged in sets of 10 Brackets with Couplers.



LAMP REFLECTOR

CODE	SCALE	TO WORK WITH
LFS-12	3/8" = 1'-0" (1:32)	LFHG & LFL
LFS-16	1/2" = 1'-0" (1:24)	LFHG & LFL
LFS-24	3/4" = 1'-0" (1:16)	LFHG & LFL



COLOR: Electrical Green
All Injection Molded
Lamp Shades Used Only For Ceiling or Overhead Applications Not Involving Stanchions.
See Page 6 (Pipe) & 18 (SX) For Stanchions.

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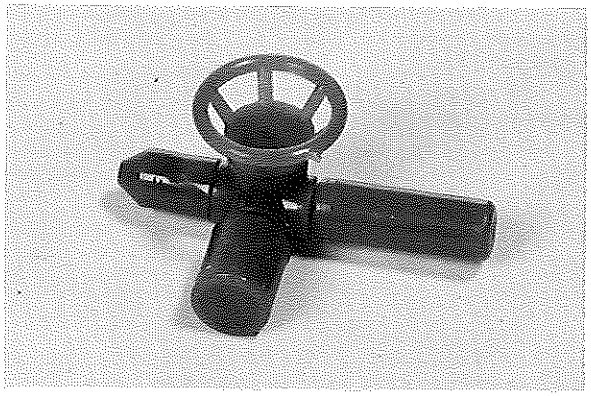
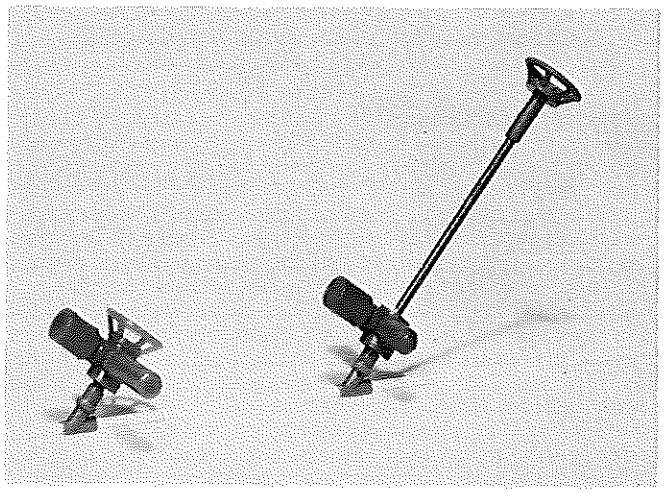
MOTOR OPERATOR SETS



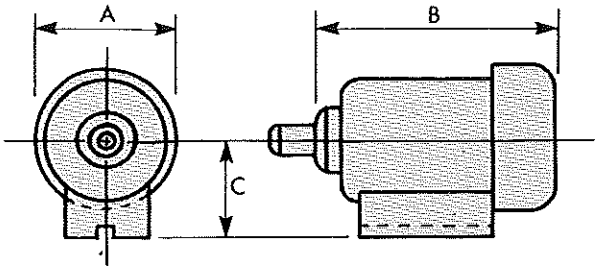
CODE	SCALE
MOS-12	3/8" = 1'0" (1:32)
MOS-16	1/2" = 1'0" (1:24)

5 Piece Set
COLOR: Electrical Green
MATERIAL: BUTYRATE



TYPICAL APPLICATIONS

MOTORS



MOTORS - 1/4" SCALE (1:48)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	13½	18	8
	M-3	16½	22	8
	M-5	19½	32	12¾
	M-7	22	38	15
	M-9	30	44	18
*	M-11	34½	51	21
*	M-12	36	56	22½
*	M-13	37½	63	27
*	M-14	45¾	74¼	31½
*	M-15	60	84	36
*	M-17	72	108	45

MOTORS - 3/8" SCALE (1:32)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	9	12	5½
	M-3	11	15	5½
	M-5	13	21½	8½
	M-7	15	25½	10
	M-9	20	29½	12
*	M-11	23	34	14
*	M-12	24	37	15
*	M-13	25	42	18
*	M-14	30½	49½	21
*	M-15	40	56	24
*	M-17	48	72	30

MOTORS - 1/2" SCALE (1:24)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	6¾	9	4
	M-3	8	11	4
	M-5	9¾	16	6
	M-7	11	19	7½
	M-9	15	22	9
*	M-11	17	25½	10½
*	M-12	18	28	11
*	M-13	18¾	31½	13½
*	M-14	23	37	15¾
*	M-15	30	42	18
*	M-17	36	54	22½

MOTORS - 3/4" SCALE (1:16)

	CODE	SCALE DIMENSIONS IN INCHES		
		A	B	C
	M-2	4½	6	2¾
	M-3	5½	7½	2¾
	M-5	6½	10¾	4¼
	M-7	7½	12¾	5
	M-9	10	14¾	6
*	M-11	11½	17	7
*	M-12	12	18½	7½
*	M-13	12½	21	9
*	M-14	15¼	24¾	10½
*	M-15	20	28	12
*	M-17	24	36	15

* Motor Bases for M-11 thru M-17 are molded separately and supplied with motors.

MATERIAL: ABS Plastic
COLOR: Electrical Green

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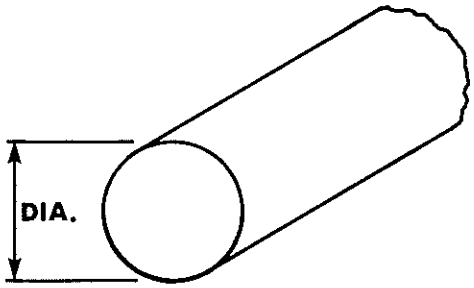
NEXT SYSTEM BEGINS ON PAGE 227.

CLEAR ACRYLIC ROD

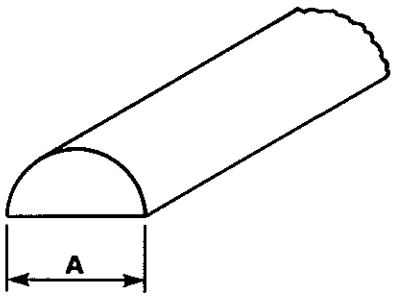
CODE	ACTUAL DIA.
CAR-2	1/16"
CAR-4	1/8"
CAR-6	3/16"
CAR-8	1/4"
CAR-10	5/16"
CAR-12	3/8"
CAR-14	7/16"
CAR-16	1/2"
CAR-18	9/16"
CAR-20	5/8"
CAR-24	3/4"
CAR-28	7/8"
CAR-32	1"
CAR-36	1-1/8"



All 3' Lengths

ACRYLIC HALF ROUND ROD

CODE	ACTUAL SIZE 'A'
CAHR-16	1/2"
CAHR-20	5/8"
CAHR-24	3/4"
CAHR-32	1"



All 3' Lengths

ACRYLIC BALLS

CODE	ACTUAL DIA.
CAB-8	1/4"
CAB-12	3/8"
CAB-16	1/2"
CAB-20	5/8"
CAB-24	3/4"
CAB-28	7/8"
CAB-32	1"
CAB-40	1-1/4"
CAB-48	1-1/2"

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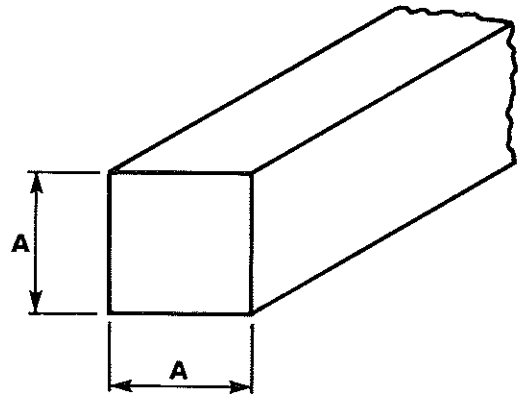
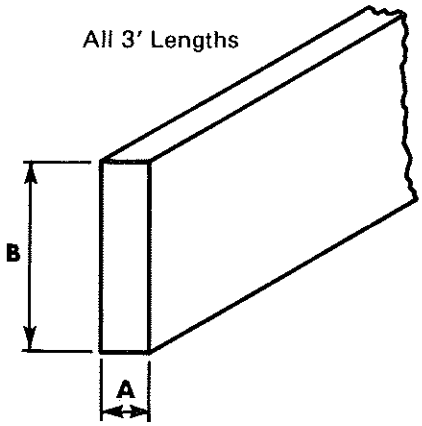
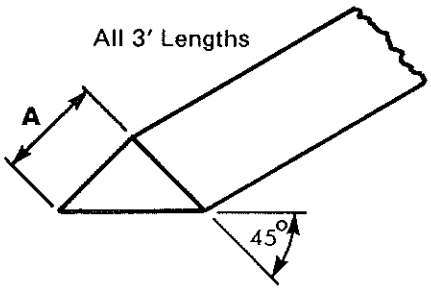
ACRYLIC SHAPES



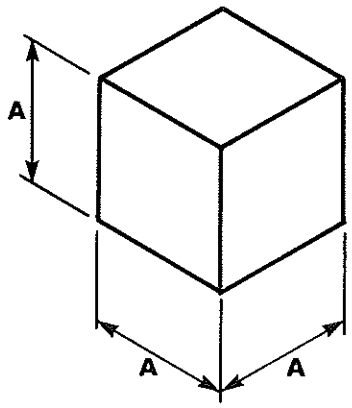
All 3' Lengths



All 3' Lengths



All 3' Lengths



ACRYLIC SQUARE ROD

CODE	ACTUAL SIZE 'A'
CASR-4	1/8"
CASR-8	1/4"
CASR-12	3/8"
CASR-16	1/2"
CASR-20	5/8"
CASR-24	3/4"
CASR-32	1"

ACRYLIC RECTANGULAR ROD

CODE	ACTUAL SIZE 'A'	ACTUAL SIZE 'B'
CARR-5	1/8"	5/8"
CARR-7	3/16"	3/4"
CARR-8	1/4"	1/2"
CARR-9	1/4"	1"
CARR-23	3/4"	1"

ACRYLIC TRIANGULAR ROD

CODE	ACTUAL SIZE 'A'
CATR-16	1/2"
CATR-20	5/8"
CATR-24	3/4"
CATR-32	1"

ACRYLIC CUBES

CODE	ACTUAL SIZE 'A'
CAC-8	1/4"
CAC-12	3/8"
CAC-16	1/2"
CAC-20	5/8"
CAC-24	3/4"
CAC-32	1"
CAC-40	1-1/4"
CAC-48	1-1/2"
CAC-64	2"

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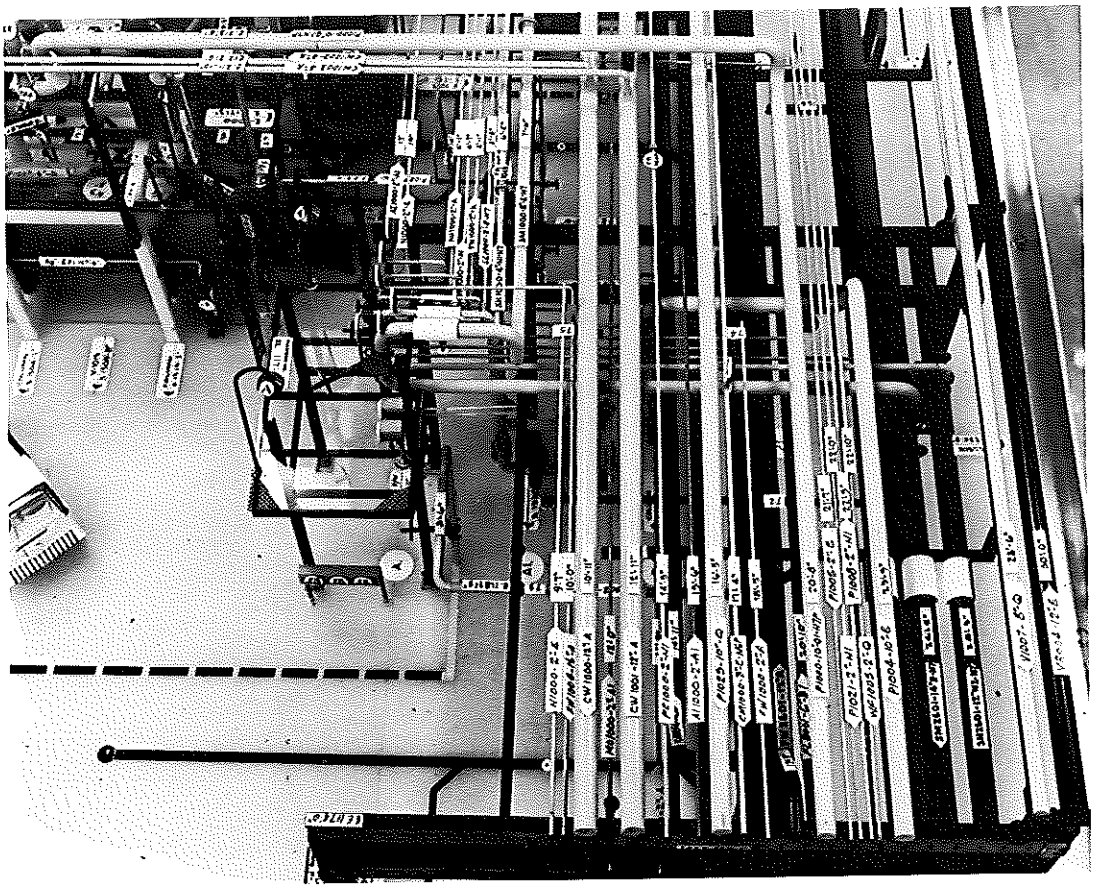
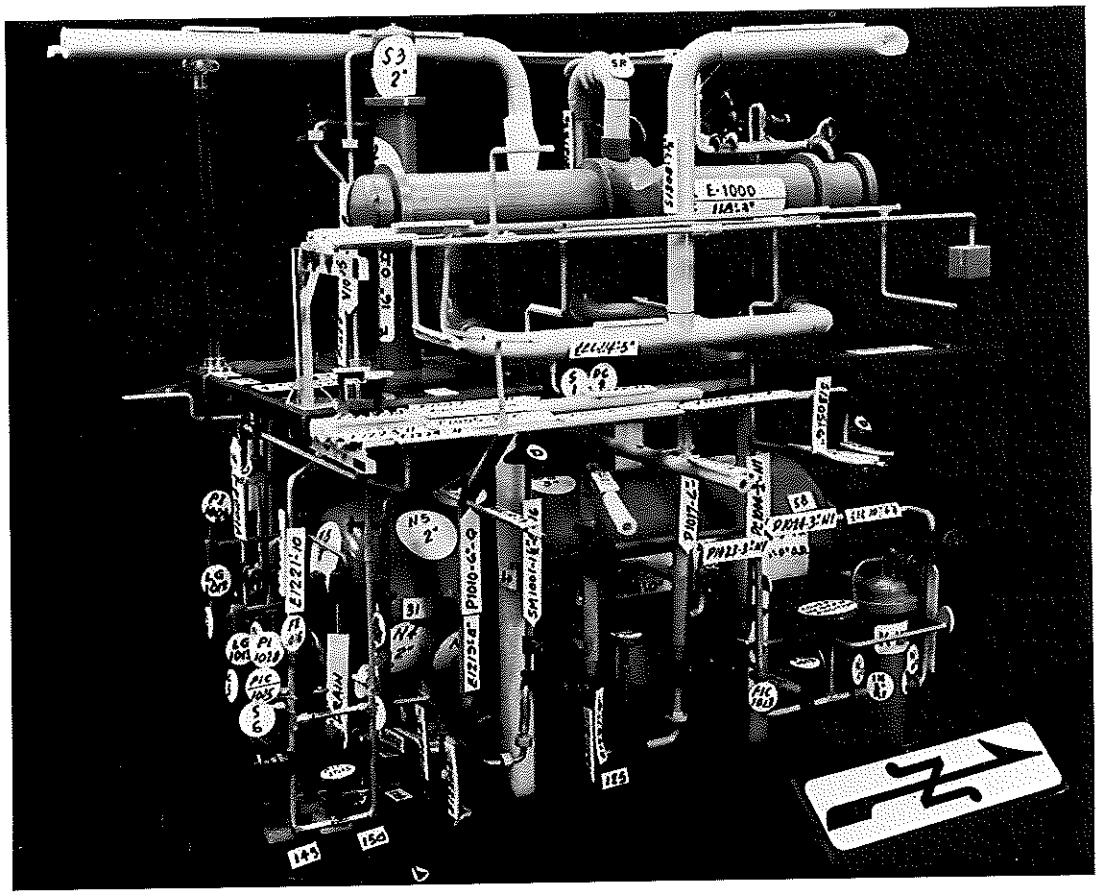
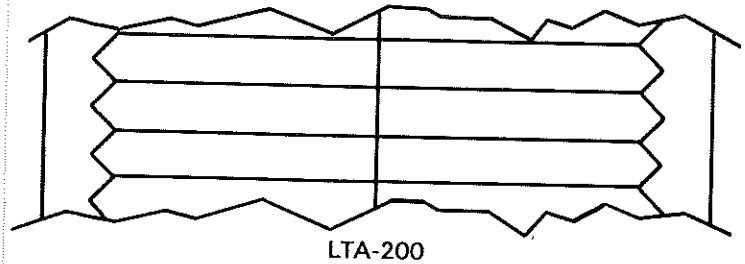
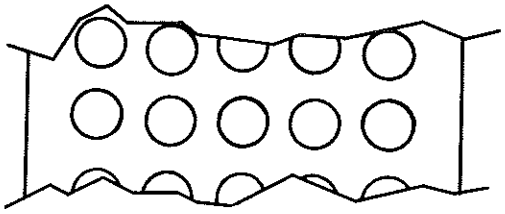



E-1000

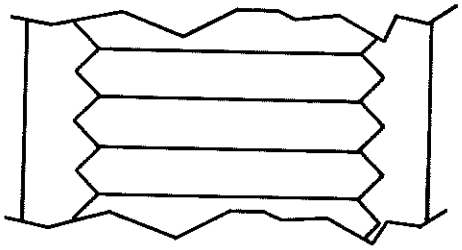
LINE TAG ARROWS & INSTRUMENT BUTTONS



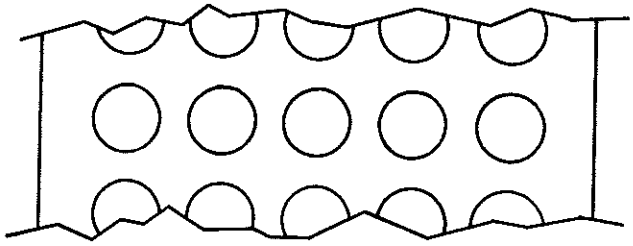
LTA-200



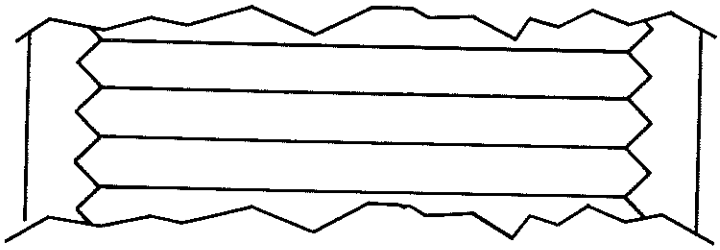
LTB-80



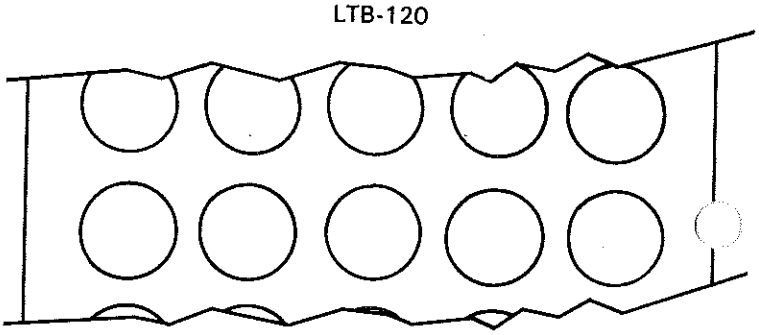
LTA-500



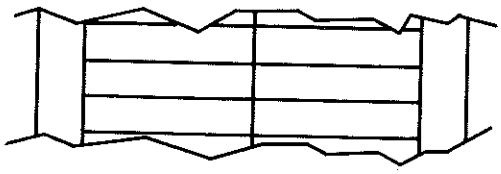
LTB-120



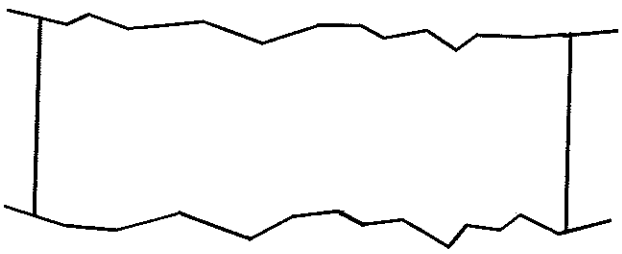
LTA-550



LTB-160



LTT-314



LTX-350

Tags Shown Actual Size

CODE	ACTUAL SIZE	NO. PER CARD
LTA-200	1/4" x 1-1/2"	50
LTA-500	1/4" x 1-5/8"	25
LTA-550	1/4" x 3"	25
LTT-314	3/16" x 7/8"	50
LTX-350	2-13/16" x 5"	1
LTB-80	1/4" DIA.	50
• LTB-120	3/8" DIA.	50
• LTB-160	1/2" DIA.	40

• Also Available In Pink & Electrical Green.

See Notes On Following Page.

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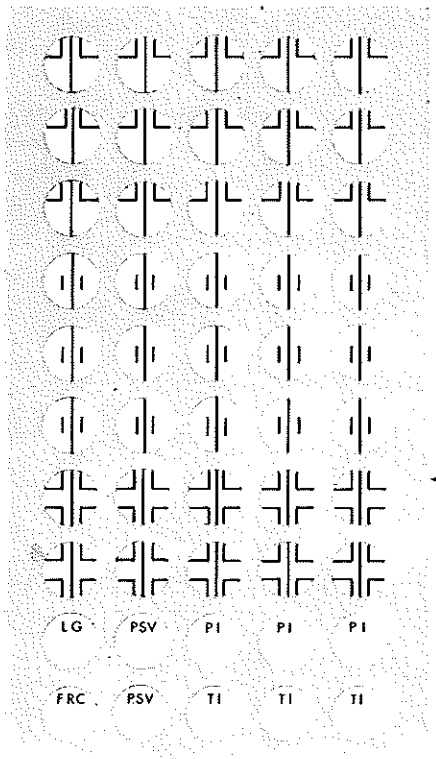
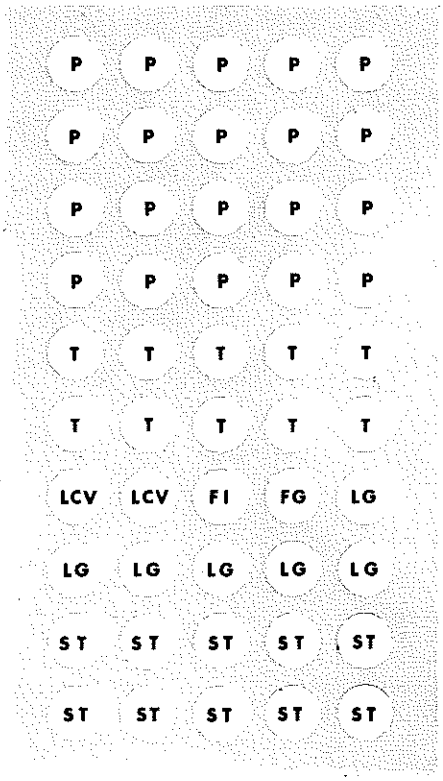
PRINTED LINE TAG BUTTONS



ACTUAL SIZE SAME AS LTB-120



CODE: LTB-121

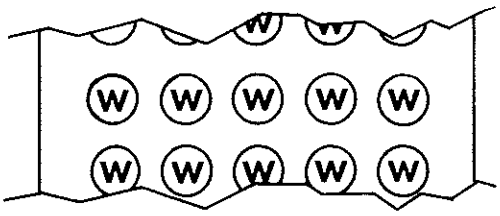
CODE: LTB-122

Recommended Designations For Symbols:

—Pipe Support

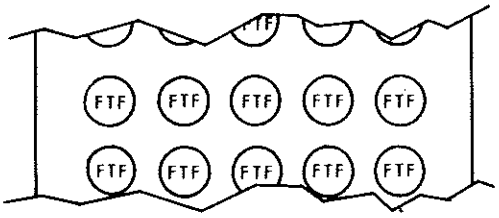
—Pipe Guide

—Anchor



CODE: LTB-82

50 Labels Per Card
Recommended Designation: Weld



CODE: LTB-81

50 Labels Per Card
Recommended Designation: Fitting To Fitting

Arrows and Buttons have an "adhesive on foam" backing that allows application to any size piping or to other materials and surfaces with maximum contact. They can easily be removed and replaced as long as surfaces are clean, and will stay in place permanently. A good firm writing surface is provided. Arrow Cards are designed to allow insertion in a typewriter.

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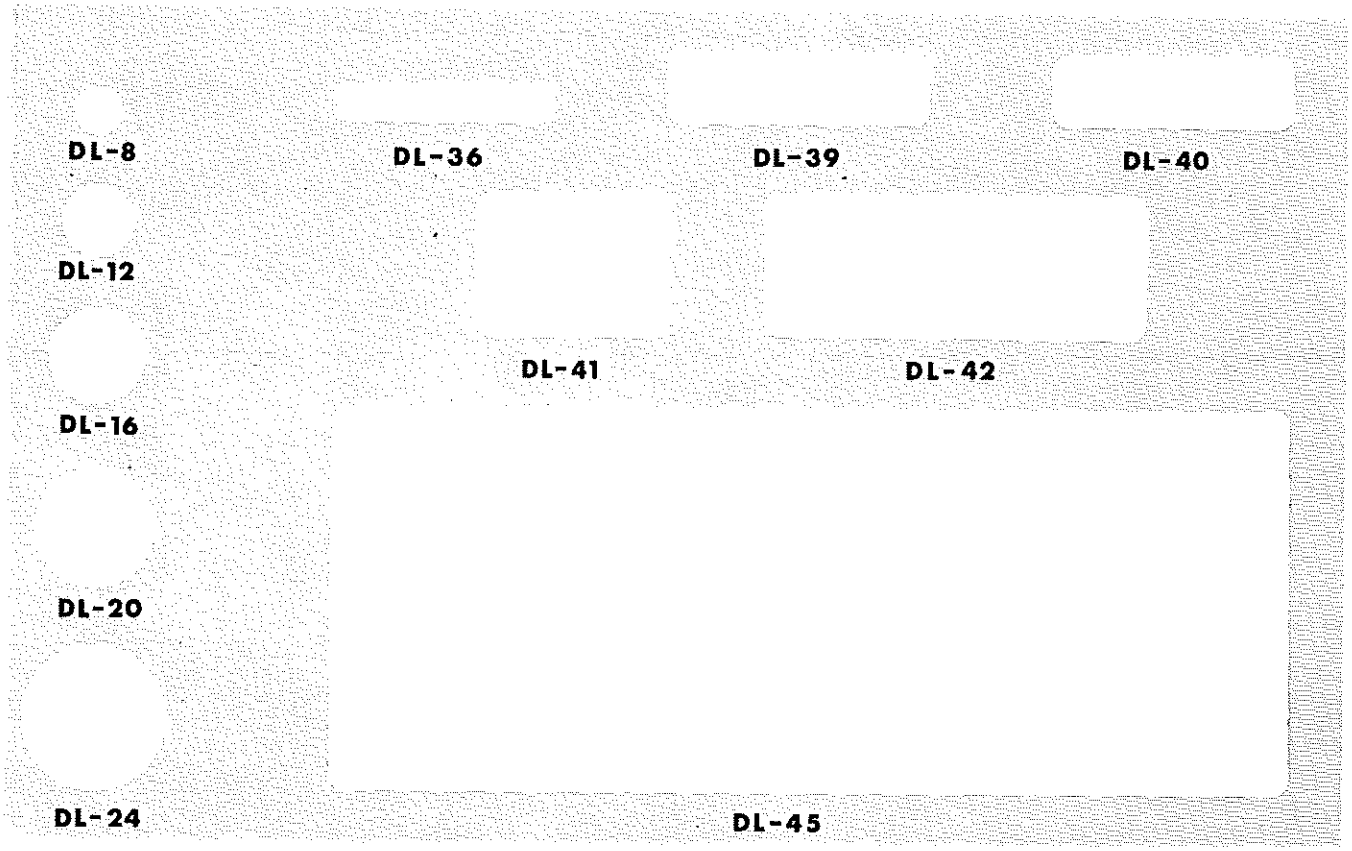
BLANK IDENTIFYING LABELS
WHITE-PRESSURE SENSITIVE MATTE FINISH



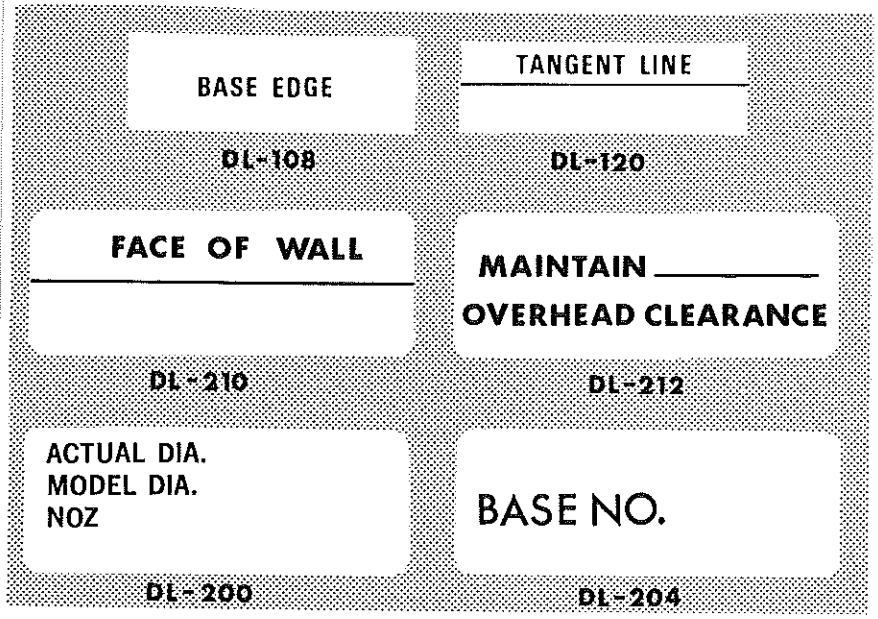
LABELS SHOWN ACTUAL SIZE

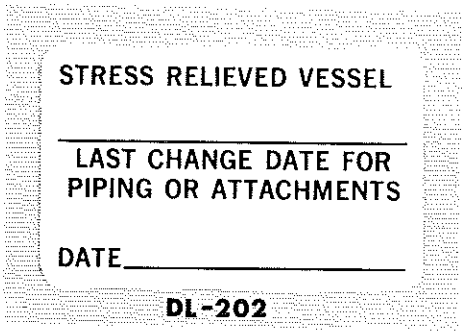
These Labels Will Adhere
To Flat Or Curved Surfaces
And Can Be Removed Cleanly.

For Lettering, Use A Pen
With Permanent, Fast-Drying,
Smudge Proof Ink (LP-2 Page 248).
Typed Labels Should Be
Sprayed With a Clear
Plastic To Prevent Smudging.

CODE	ACTUAL SIZE	NO. PER SHEET
DL - 8	1/4" DIA.	50
DL - 12	3/8" DIA.	50
DL - 16	1/2" DIA.	50
DL - 20	5/8" DIA.	40
DL - 24	3/4" DIA.	25
DL - 36	3/16" X 1-1/8"	25
DL - 39	3/8" X 1-3/8"	25
DL - 40	3/8" X 1-1/4"	25
DL - 41	3/4" X 1"	25
DL - 42	3/4" X 2"	15
DL - 45	2" X 5"	1

MISCELLANEOUS IDENTIFYING LABELS



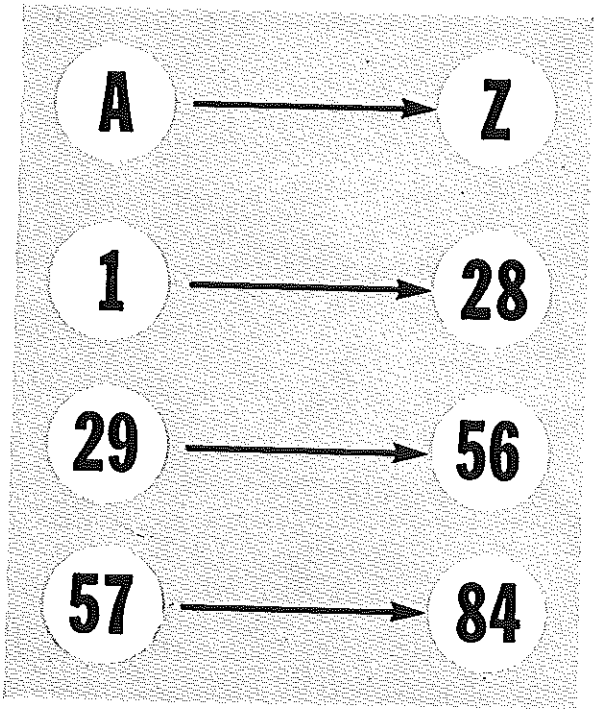


CODE	NUMBER PER SHEET
DL-108	20
DL-120	20
DL-200	15
DL-202 ✳	6
DL-204	15
DL-210	15
DL-212	15

✳COLOR: Pink

Labels Shown Actual Size

COLUMN LINE LABELS



CODE	NUMBER PER CARD
DL-AZ	A thru Z
DL-28	1 thru 28
DL-56	29 thru 56
DL-84	57 thru 84

Labels Shown Actual Size

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ELEVATION & ORIENTATION IDENTIFYING LABELS

B.O.P. EL.
DL-BP

T.O.S. EL.
DL-TS

H. P. PAVING
EL.
DL-HP

PLATFORM NO.
EL.
DL-PN

0°
90°
180°
270°
DL-100
10 PER SHEET

T.O.S.
EL.
DL-102

H.P. PAVING
EL.
DL-104

PLATFORM NO.
EL.
DL-106

BOT. OF TRAY EL.
DL-124

B.O.D.
EL.
DL-126

GRADE ELEVATION
BASE ____ AREA ____
DL-206

FLOOR ELEVATION
BASE ____ AREA ____
DL-208

H.P. of CONC.
THICKNESS
DL-214

Labels shown actual size.

CODE	ACTUAL SIZE	NO. PER SHEET
DL-BP	3/16" x 1-1/8"	25
DL-TS	3/16" x 1-1/8"	25
DL-HP	3/8" x 1-1/8"	25
DL-PN	3/8" x 1-1/8"	25
DL-100	1/4" DIA.	10 each
DL-102	3/8" x 1-3/8"	25
DL-104	3/8" x 1-3/8"	25
DL-106	3/8" x 1-3/8"	25
DL-124	1/4" x 2"	25
DL-126	3/4" x 1"	25
DL-206	3/4" x 2"	15
DL-208	3/4" x 2"	15
DL-214	3/4" x 2"	15

These Labels Will Adhere
To Flat Or Curved Surfaces
And Can Be Removed Cleanly.

SCALE IDENTIFYING LABELS

SCALE
3/8" = 1'-0"
DL-310

SCALE
1/2" = 1'-0"
DL-312

SCALE
3/4" = 1'-0"
DL-314

Labels shown actual size.

CODE	NUMBER PER SHEET
DL-310	15
DL-312	15
DL-314	15

SUPPLIER IDENTIFYING LABELS

COMBUSTION ENGINEERING
DL-400

GENERAL ELECTRIC
DL-402

WESTINGHOUSE
DL-404

Names are continuous on strips. Just cut one name at a time.

Labels shown actual size.

CODE	NUMBER PER SHEET
DL-400	20
DL-402	30
DL-404	30

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CENTER—LINE IDENTIFYING LABELS

CENTERLINE

DL-128

℄

DL-CL

℄ COLUMN

DL-114

℄ LADDER

DL-110

℄ DISCHARGE

DL-116

℄ CHANNEL NOZ.

DL-112

℄ FIXED SUPPORT

DL-118

℄ WALL

DL-122

Labels Shown Actual Size

CODE	NUMBER PER SHEET
DL-CL	20
DL-110	20
DL-112	20
DL-114	20
DL-116	20
DL-118	20
DL-122	20
DL-128	25

These Labels Will Adhere To Flat Or Curved Surfaces And Can Be Removed Cleanly.

NORTH
LOOKING SOUTH

DL-302

SOUTH
LOOKING NORTH

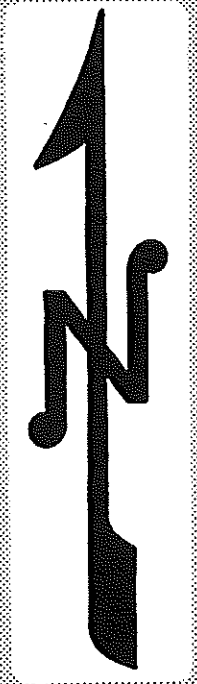
DL-304

EAST
LOOKING WEST

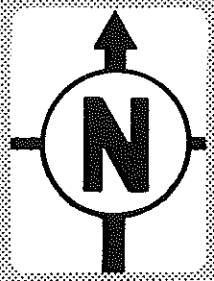
DL-306

WEST
LOOKING EAST

DL-308



DL-NA



DL-216

Labels Shown Actual Size

CODE	NUMBER PER SHEET
DL-NA	5
DL-216	20
DL-302	15
DL-304	15
DL-306	15
DL-308	15

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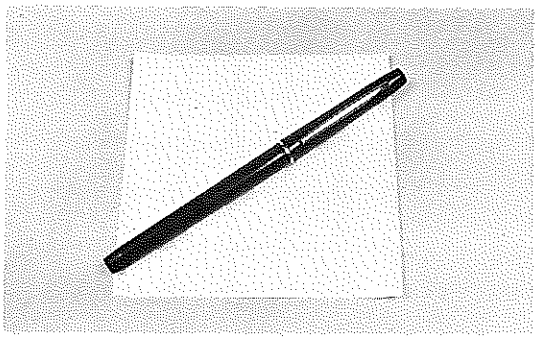
MARKING INSTRUMENTS

LETTERING PEN

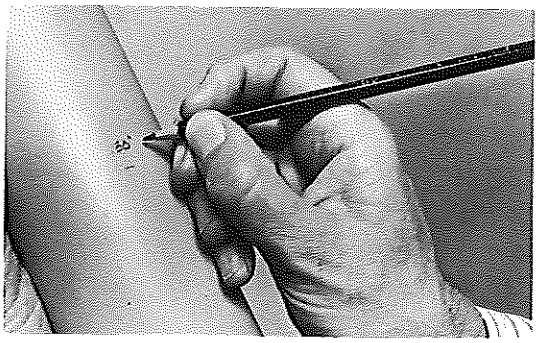


CODE: LP-2

For Identifying Labels,
Line Tag Arrows And
Instrument Buttons.

This Pen Contains A Permanent Fast Drying, Smudge-Proof Black Ink. The Nylon Nib Allows For Neat Lettering And Retains Its Point Well.

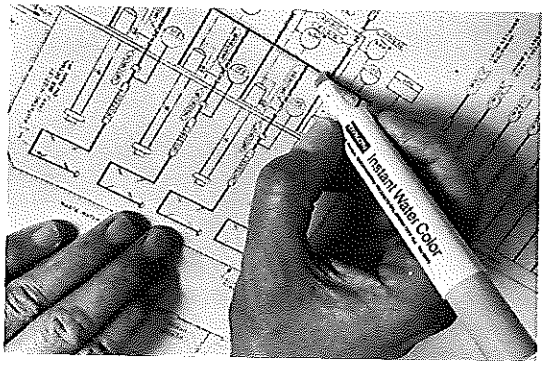
PLASTIC MARKING PENCIL



CODE: LP-3

Ideal For Marking On
Plastics

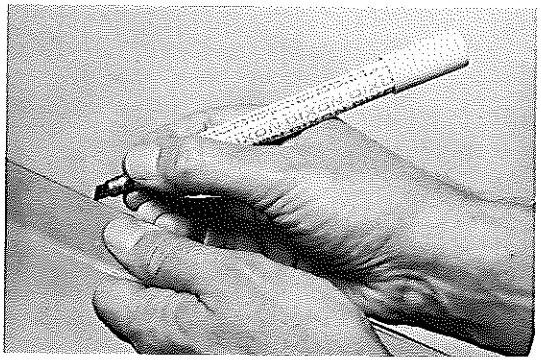
HIGHLIGHTER



CODE: LP-4

Yellow Water Color Marker
For Checking Drawings
Or HighLighting Important
Notes.

FELT TIP MARKING PEN



CODE: LP-5

For Tag Checking Or
Color Coding Electrical Trays.

*COLORS:

R—Red	O—Orange
Y—Yellow	BK—Black
B—Blue	BR—Brown
G—Green	PP—Purple

Add Color Code To
End Of Code

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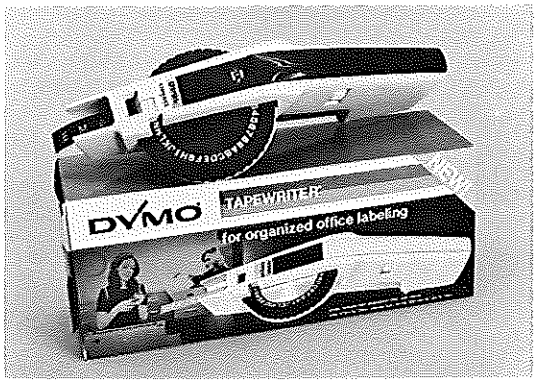

DYMO LABELING SYSTEM

Deluxe Labeling Kit (above left) includes:
- One Chrome Plated Tapewriter
- One Each 3/8" x 12' & 1/2" x 12' Rolls of Dymo Embossing Tape
- One Each .180" & .200" Character Height Horizontal Embossing Wheels
- One .160" Character Height Vertical Embossing Wheel
- Convenient Carrying Case.

CODE: DTW-1570

Economical Plastic Tapewriter (above right) with closer character spacing for efficient use. Comes with one 1/2" x 12' roll of Dymo Embossing Tape and one .180" Character Height Horizontal Embossing Wheel.

CODE: DTW-1540

Vertical .160" Character Height Embossing Wheel. May be used with either tapewriter.

CODE: DTV-3000

Both Tapewriters Feature:
- Interchangeable Character Wheels
- Forward and Reverse Tape Feed Knob
- Dual Track - 3/8" wide and 1/2" wide tape capacity

Non-Glare Vinyl Embossing Tapes

CODE: DT-5	3/8" x 12'
CODE: DT-6	1/2" x 12'

Add color designation to end of code to specify color. Example: DT-5BK

SIZE	EMA COLORS															
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
5	X	X	X	X	X		X	X		X					X	X
6	X	X	X	X	X		X	X		X					X	X

SEE PAGE 2 FOR COLOR CHART

Clear is not available in non-glare.

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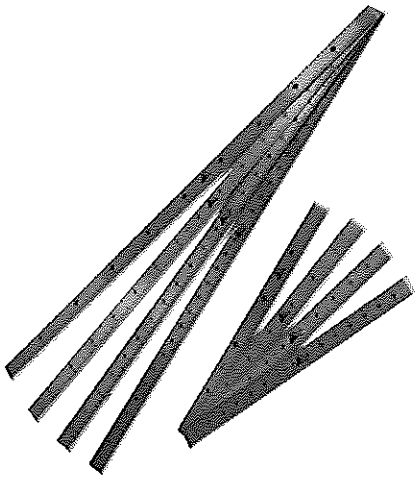
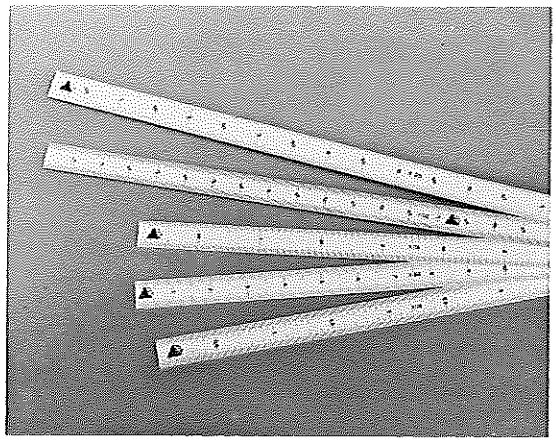


STAINLESS STEEL SCALE RULES

CODE	ACTUAL LENGTH	SCALE
SC-8	12"	1/4" = 1'-0"
SC-86	6"	1:48
SC-12	12"	3/8" = 1'-0"
SC-126	6"	1:32
SC-16	12"	1/2" = 1'-0"
SC-166	6"	1:24
SC-24	12"	3/4" = 1'-0"
SC-246	6"	1:16
SM-33	300mm	METRIC
SM-336	150mm	1:33 - 1/3

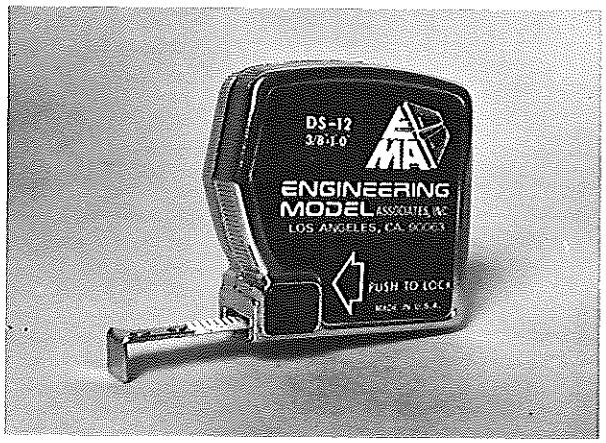
All Scale Rules are High Quality Stainless Steel; Accurately Graduated to be easily legible from any view. Rules are graduated both sides with reverse calibration so that either end can be used for Butt Measurements.



PLASTIC SCALE RULES

CODE	ACTUAL LENGTH	SCALE
MS-8	15" 375mm	¼"=1'-0" (1:48)
MS-12	18" 450mm	⅜"=1'-0" (1:32)
MS-15	18" 450mm	METRIC (1:15)
MS-16	12" 300mm	½"=1'-0" (1:24)
MS-16m	12" 300mm	METRIC (1:16)
MS-20	18" 450mm	METRIC (1:20)
MS-24	18" 450mm	¾"=1'-0" (1:16)
MS-25	18" 450mm	METRIC (1:25)
MS-32	18" 450mm	METRIC (1:32)
MS-33	18" 450mm	METRIC (1:33)
MS-50	18" 450mm	METRIC (1:50)

Made of White pliable plastic with black graduations.



8-FOOT TAPE RULES

CODE	SCALE
DS-12	3/8" = 1'-0" 1:32
DS-16	1/2" =1'-0" 1:24
DS-24	3/4" = 1'-0" 1:16
DM-33	METRIC 1:33 - 1/3

Jet Black Numerals on 1/2" wide blade. New Case with Blade Lock, Spring Return, and Belt Clip.

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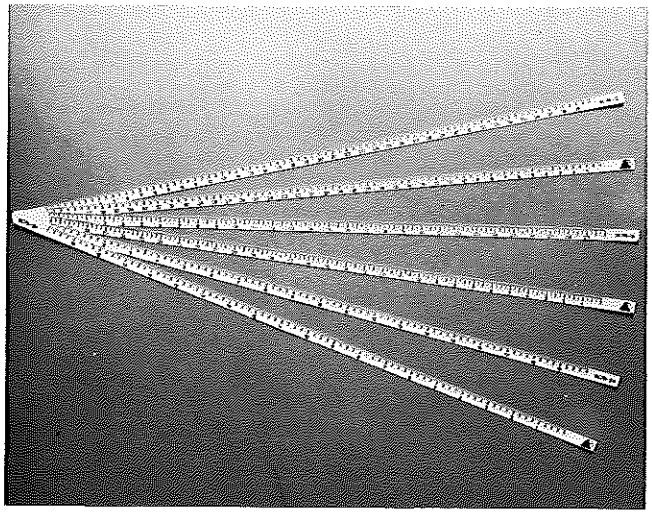
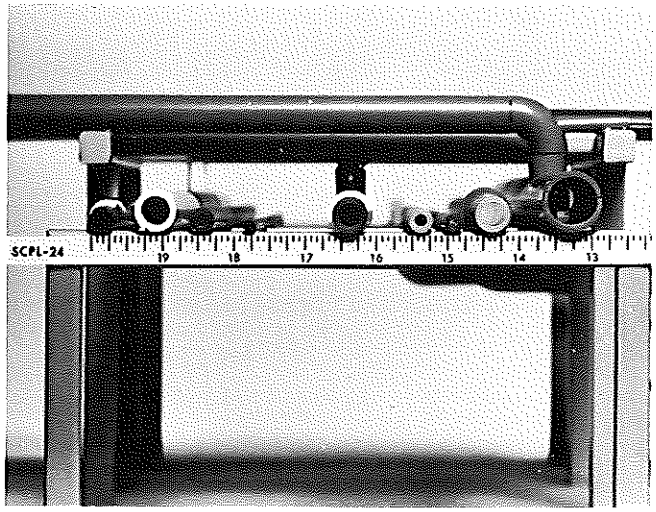
PIPEWAY SCALES





15" ACTUAL LENGTH

CODE	RIGHT OR LEFT HAND	SCALE	NO. PER PACKAGE
SCPR-12	RIGHT	3/8" = 1'-0"	5
SCPL-12	LEFT	1:32	5
SCPR-16	RIGHT	1/2" = 1'-0"	5
SCPL-16	LEFT	1:24	5
SCPR-24	RIGHT	3/4" = 1'-0"	5
SCPL-24	LEFT	1:16	5

Accurately graduated on White Mylar.
PRESSURE-SENSITIVE ADHESIVE BACKING NOT AFFECTED BY SOLVENTS.

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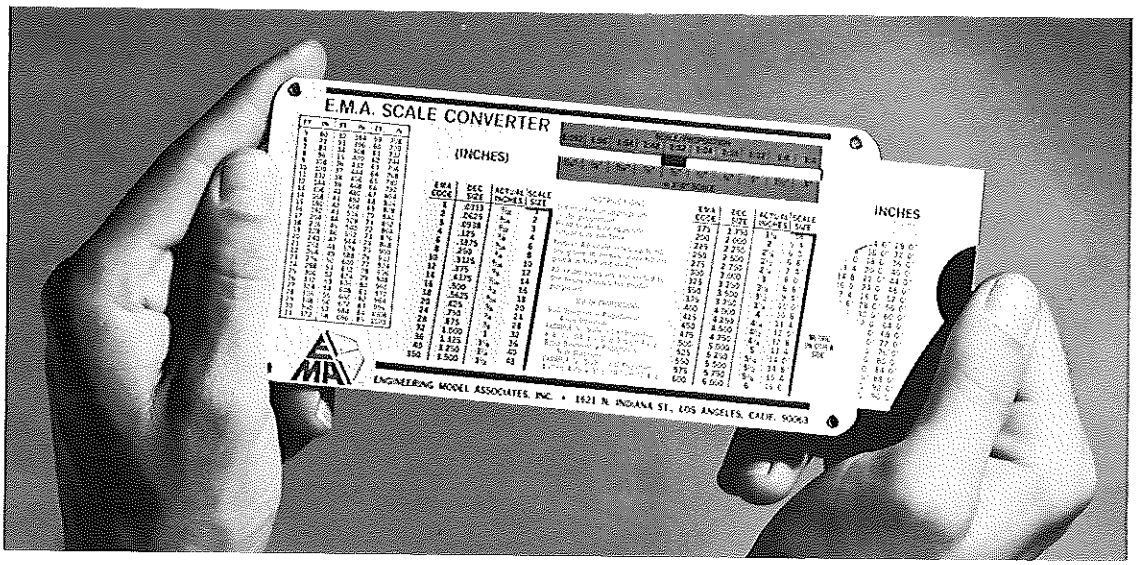
E.M.A. SCALE CONVERTER



The E.M.A. Scale Converter was developed to allow the speedy conversion of actual to scale dimensions, or conversely, scale to actual dimensions. All the commonly used scales, and their proportion to actual, are displayed. The Converter displays instant readout of all E.M.A. code sizes in any of the appropriate scales. (The reverse for the selection of E.M.A. code sizes.)

Conversions in inches are displayed on one side of the Converter with the commonly used metric scales on the opposite side.

Easy to use—Convenient associated tables.

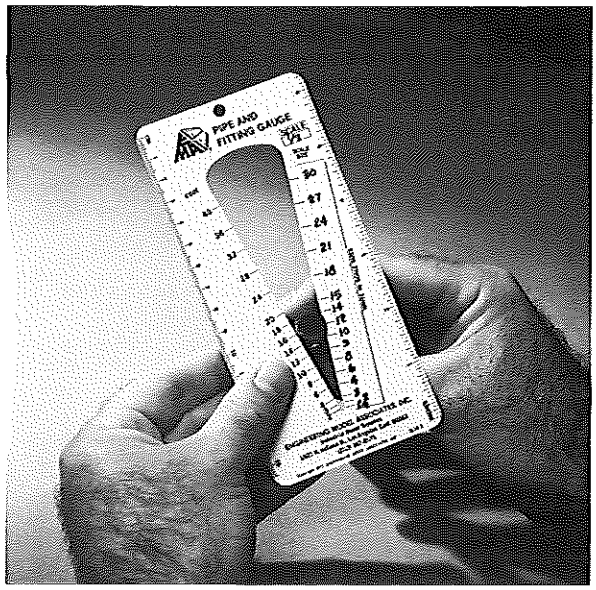
A "must" for every model technician.

CODE: SCM-1

THE E.M.A. PIPE & FITTING GAUGE

The E.M.A. Pipe and Fitting Gauge is a simple pocket device to allow the speedy identification of pipe and fitting sizes—in any scale. The printed figures to the left of the calibrated cut-out indicate the E.M.A. Code sizes. The writing surface to the right of the cut-out allows the writing in of the scale sizes to the particular scale in which you are working. Referring to the E.M.A. Scale Converter it is a simple matter to write in the appropriate scale sizes on the right hand to correspond with the printed E.M.A. Code sizes on the left hand scale.

CODE: SCM-3



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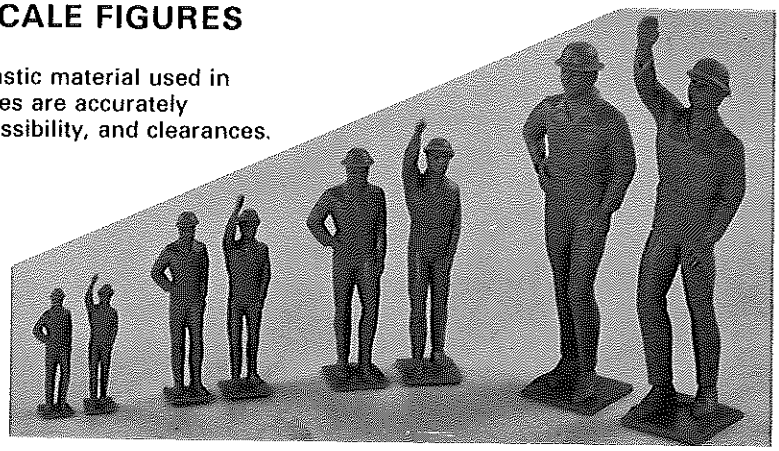
SCALE FIGURES

Scale Figures are injection molded of ABS (same plastic material used in the structural components) for easy mounting. Figures are accurately detailed and designed to indicate aisle spacing, accessibility, and clearances.

COLOR: SUNTAN



CODE	SCALE	TYPE
SF-8	1/4" = 1'-0"	Standing
RF-8	1:48	Reaching
SF-12	3/8" = 1'-0"	Standing
RF-12	1:32	Reaching
SF-16	1/2" = 1'-0"	Standing
RF-16	1:24	Reaching
SF-24	3/4" = 1'-0"	Standing
RF-24	1:16	Reaching

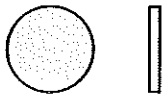
LEGEND MARKERS

LM - ( ) - 4
INSTRUMENT MARKER

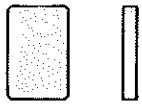
CODE *
LM - ( ) - 4
LMD - ( ) - 12
LMR - ( ) - 8

Packaged in bags of 50's.
Minimum order one bag of 50 pieces.

LMD - ( ) - 12
DISC MARKER



LMR - ( ) - 8
RECTANGULAR MARKER



Legend Markers are used to locate and identify any apparatus not normally detailed on the model. For example: Instruments, Level Points, Traps, Vents and Drains; P.I.'s and T.I.'s; Anchors, Spring Hangers and Guides; Special Valve conditions; and innumerable other designations or applications.

Material — Butyrate

Markers shown Actual Size

*

SIZE	EMA COLORS															
	R	Y	B	G	O	W	BK	BR	VL	VG	P	EG	T	LB	C	PP
4	X	X	X	X	X	X	X				X	X	X	X		X
8	X	X	X	X	X	X	X				X	X	X	X		X
12	X	X	X	X	X	X	X				X	X	X	X		X

SEE PAGE 2 FOR COLOR CHART

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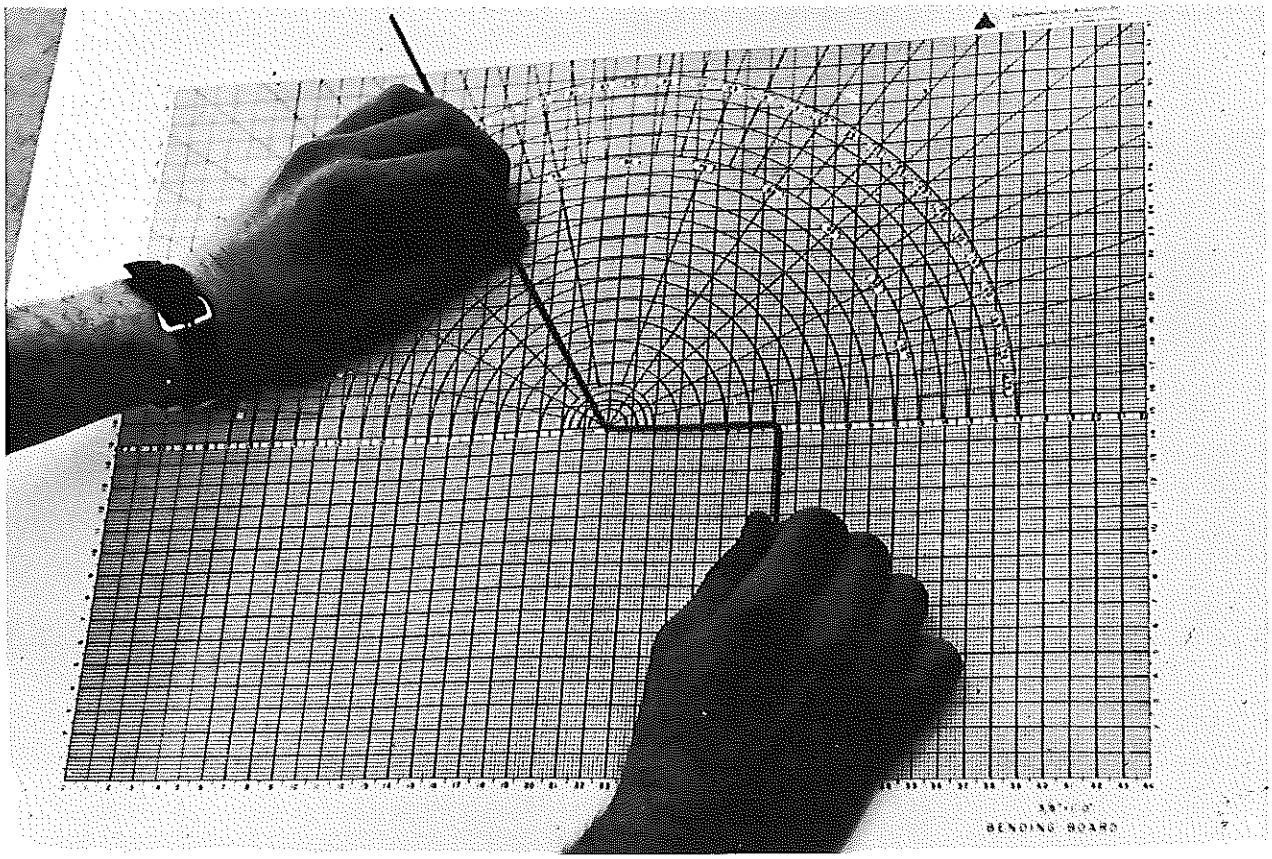
BENDING BOARDS



Printed on indestructible Mylar Film to be mounted on flat white-faced board.

Supplied with Pressure Sensitive Adhesive Backing and Peel-Back Release Paper.

An indispensable Measuring Device, particularly for the small pipe with wire cores. Bends and angles can be measured and made right on the board.

CODE	SCALE	ACTUAL SIZE
J-12	3/8" = 1'-0" 1:32	15" x 18"
J-16	1/2" = 1'-0" 1:24	20" x 24"
J-33	1:33 - 1/3	15" x 18"

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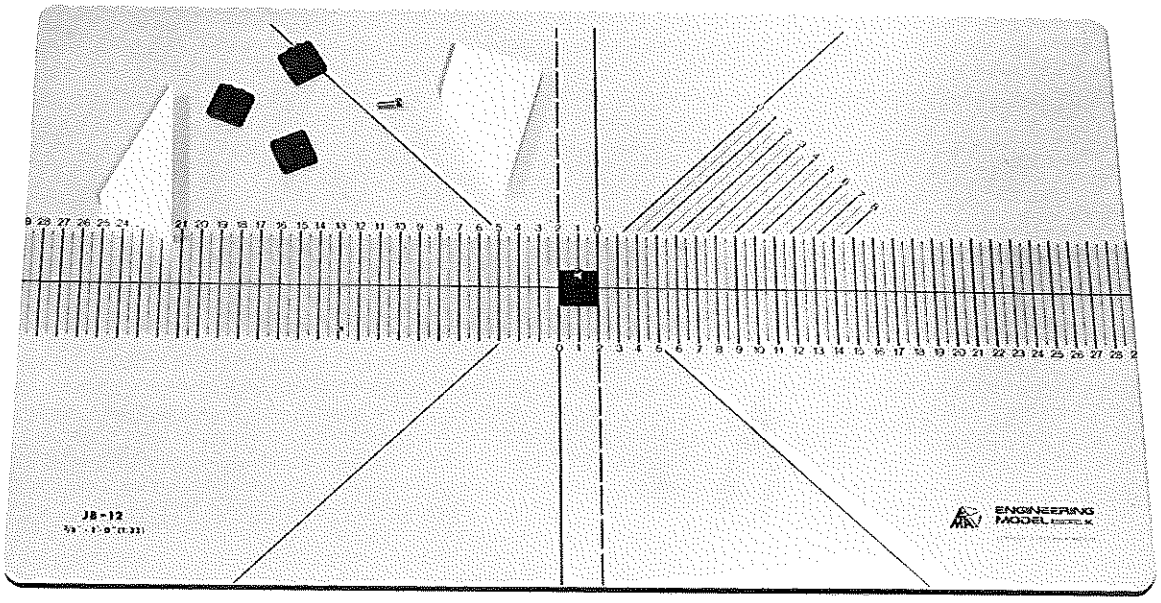
E.M.A. PIPE BENDING JIG



The E.M.A. Pipe Bending Jig is 12" wide by 21" long. It has a printed layout grid annodized into .060 aluminum with a ¼" oil tempered masonite backing to eliminate warp. Injection molded insert guides accommodate pipe sizes P-( )-1, P-( )-2, P-( )-3 and P-( )-4, all of which use a metal core. Two bending blocks, 30° & 60° and 45° & 90°, are also furnished.

Using the jig the model maker can form the proper bending radius and obtain straight runs that are dimensionally accurate. Almost any configuration can be formed from a single section of pipe. Moreover, by eliminating the cutting and joining of pipe and the use of pliers, the jig can be a significant time saver.

CODE	SCALE
JB-12	⅜" = 1' - 0" (1:32)
JB-16	½" = 1' - 0" (1:24)
JB-24	¾" = 1' - 0" (1:16)

Replacement Insert Guides - Set of 4
CODE: JBG-4

Replacement Bending Blocks - Set of 2
CODE: JBB-2

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NEXT SYSTEM BEGINS ON PAGE 283.

SPRAYMATCH PAINT

CODE	COLOR
SM - R	RED
SM - Y	YELLOW
SM - B	BLUE
SM - G	GREEN
SM - O	ORANGE
SM - W	WHITE
SM - BK	BLACK
SM - BR	BROWN
SM - VL	VIOLET
SM - VG	VALVE GRAY
SM - P	PINK
SM - EG	ELECTRICAL GREEN
SM - LB	LIGHT BLUE
SM - T	TAN
SM - CG	CONCRETE GRAY
SM - SG	STEEL GRAY
SM - VE	VESSEL & EQUIPMENT GRAY

12 Ounce Spray-can

Spraymatch Paints are a fine quality fast dry lacquer packaged in 12 oz. Aerosol cans for instant use. Colors to match all of our product lines are provided in convenient containers with can-caps indicating the color of the contents.

Instructions for use printed on can labels.

BECAUSE OF AIR SHIPPING REGULATIONS, PAINT IS SHIPPED SEPARATELY BY FASTEST SURFACE CARRIER. PLEASE ALLOW SUFFICIENT TIME FOR DELIVERY.

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COLORMATCH PAINT

CODE	COLOR
CM - R	RED
CM - Y	YELLOW
CM - B	BLUE
CM - G	GREEN
CM - O	ORANGE
CM - W	WHITE
CM - BK	BLACK
CM - BR	BROWN
CM - VL	VIOLET
CM - VG	VALVE GRAY
CM - P	PINK
CM - EG	ELECTRICAL GREEN
CM - LB	LIGHT BLUE
CM - T	TAN
CM - CG	CONCRETE GRAY
CM - SG	STEEL GRAY
CM - VE	VESSEL & EQUIPMENT GRAY

Pint Cans

Lock-top can to avoid spillage.
Colormatch Paints are a fine quality lacquer paint.
Use at can consistency for brushing.
To spray, reduce 1 to 1 with Methyl Ethyl Ketone.

BECAUSE OF AIR SHIPPING REGULATIONS, PAINT IS SHIPPED SEPARATELY BY FASTEST SURFACE CARRIER. PLEASE ALLOW SUFFICIENT TIME FOR DELIVERY.

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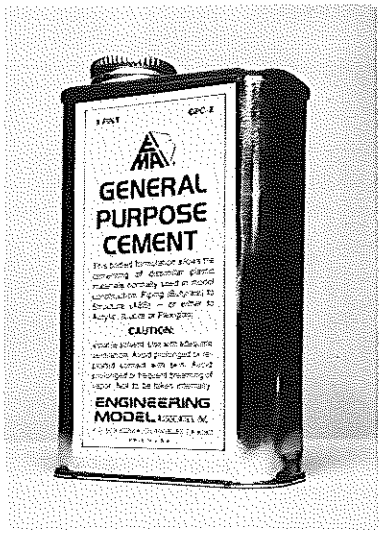


SOLD IN PINT CANS

Cements are fast drying and will not blush. Safe flash points to allow shipping and handling.

CODE: GPC-2

GENERAL PURPOSE CEMENT

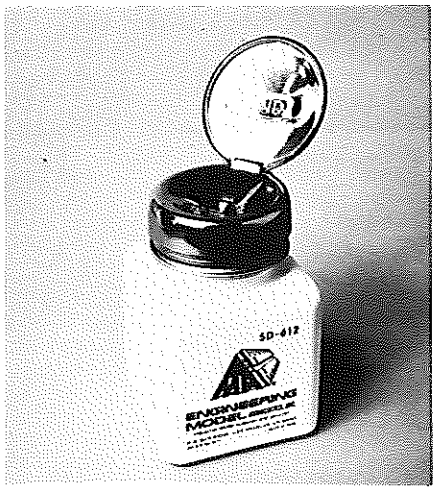
This bodied formulation allows the cementing of dissimiliar plastic materials normally used in model construction. Piping (Butyrate) to Structure (ABS) — or either to Acrylic.

CODE: PPC-2

PLASTIC PIPING CEMENT

Solvent Cement — this formulation allows the cementing of similiar plastic materials used in model construction.

SOLVENT DISPENSER

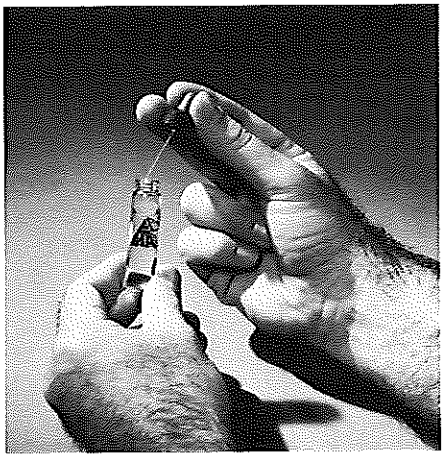


The ideal dispenser for Solvent Cement. Finest stainless steel pump unit with molded polyethylene bottle. Light pressure of brush on dispensing dish instantly pumps desired amount of solvent. No spills, fumes or contamination. Fast — Safe — Economical.

NOTE: Not recommended for GPC-2 or any viscous or bodied cements.

CODE: SD-612

SOLVENT APPLICATOR



One ounce capacity. Perfect for the application of Solvent Cement.

NOTE: Not recommended for GPC-2 or any viscous bodied cements.

CODE: SA-1

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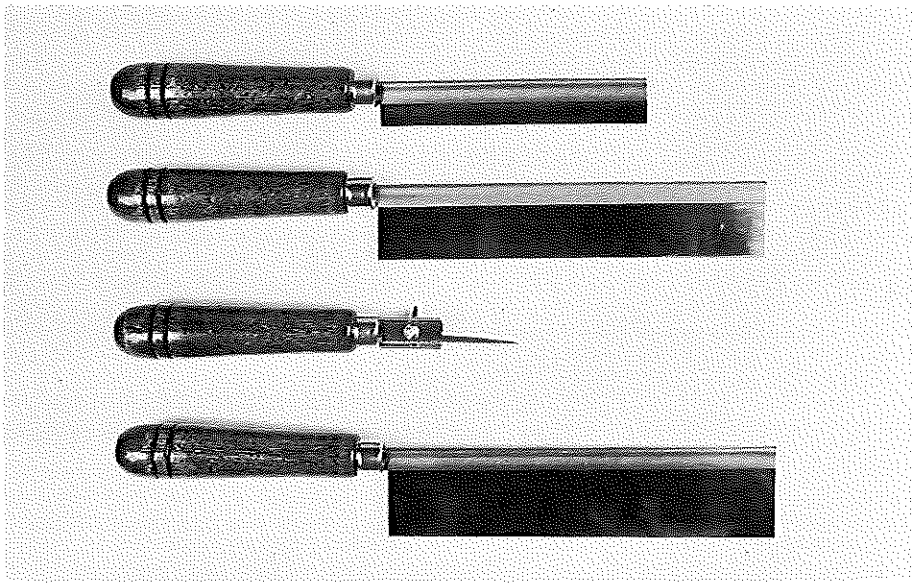
NEXT SYSTEM BEGINS ON PAGE 301.

ZONA SAWS



ZS-200

ZS-300

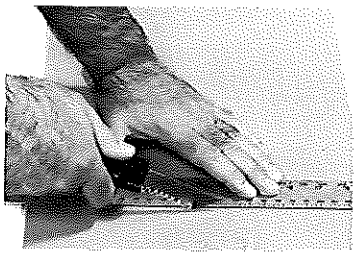
ZS-400
(contains extra blade)

ZS-500

REPLACEMENT BLADES

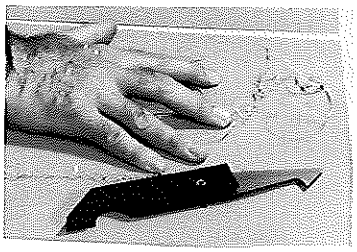
BLADE CODE NO.	FOR SAW	BLADE LENGTH	CUT DEPTH	TEETH PER IN.
ZSB-208	ZS-200	4-1/2"	7/16"	32
ZSB-308	ZS-300	6-1/2"	7/8"	24
ZSB-408	ZS-400	1-1/4"	SABRE SAW	24
ZSB-508	ZS-500	6-1/2"	1-3/16"	32

SHEET PLASTIC CUTTING TOOL



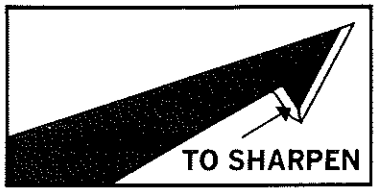
SCRIBING:

Use a straight edge as a guide, as shown in photo, for good straight cuts. Place the cutting point (↗) at the edge of the material away from you and, applying light pressure, draw the cutting point the full width of the material. Repeat the operation until the scribing depth is approximately three quarters material thickness. A template may be used for scribing curves and other designs.



BREAKING:

Refer to Photo. Hold one side of the panel firmly with one hand near the scribe line. With the other hand, lift the short side of the panel, starting at one end of the panel and progressively break the material full width at the scribe line. Additional scribing may be required if heavy pressure is required for breaking.



TO SHARPEN:

The tool is made of quality materials for long life usage. No replacement blade is necessary if properly sharpened. Resharpen (see diagram) by filing or grinding the flat cutting face of the tool. The rear bevel ground portion of the tool does not require sharpening.

CODE: KS-2

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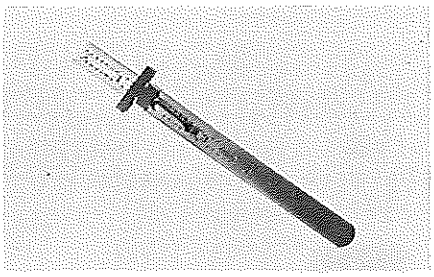
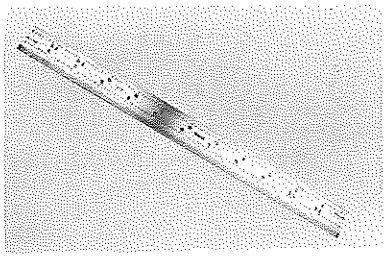


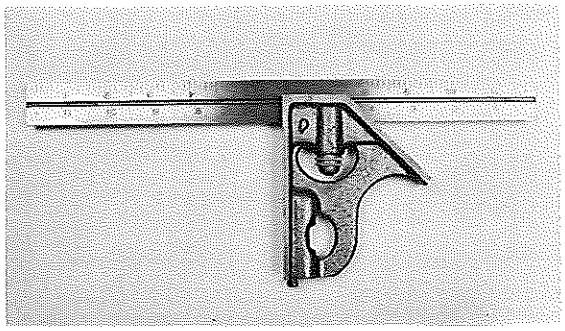
6" Stainless Steel Pocket Rule with Clip. Face is graduated on both edges in 32nds and 64ths. Back side has fraction to decimal conversions.

CODE: TH-300



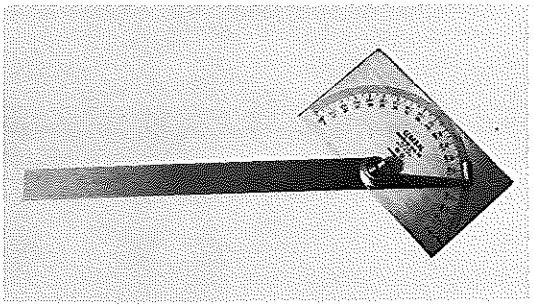
12" Stainless Steel Rule. One side graduated in 32nds and 64ths. Other side is in 8ths and 16ths.

CODE: TH-1276



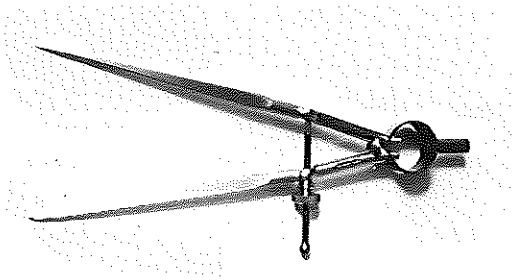
12" Combination Square by GENERAL HARDWARE. 12" x 1" Nickle Plated Steel Blade with 8th and 16th graduations on one side and 16ths and 32nds on the other side. Machined and Enameled Cast Iron Head with Level and Scriber.

CODE: TH-812



Protractor by GENERAL HARDWARE. Graduated from 0° to 180° in opposite directions. 6" Adjustable Arm Set with Knurled Thumb Nut.

CODE: TH-17



6" Industrial Spring Divider by GENERAL HARDWARE with Hardened Bow Springs and Bearing Spools. Forged Legs with central adjustment screw.

CODE: TH-5006

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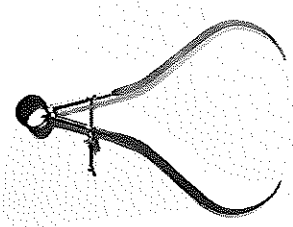
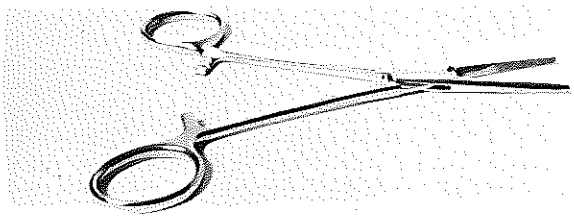
8" O.D. Spring Calipers by GENERAL HARDWARE with Hardened Bow Springs and Bearing Spools.

CODE: TH-5028



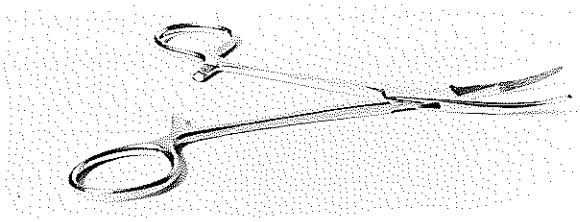
6" Straight Hemostats.
Stainless Steel with Serrated Jaws.

CODE: TH-42



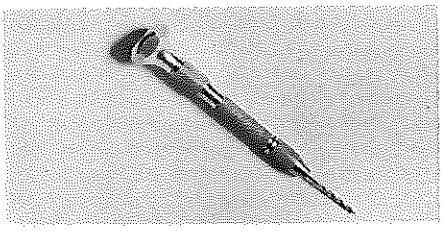
6" Curved Hemostats.
Stainless Steel with Serrated Jaws.

CODE: TH-43



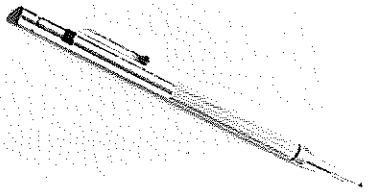
Swivel Head Pin Vise from GENERAL HARDWARE. Two Double-End Collets have capacity up to .187 in.

CODE: TH-92



Carbide Tip Pocket Scriber by GENERAL HARDWARE. Point may be reversed into barrel when not in use.

CODE: TH-88



3M TAPES

1/2" x 108' Double-Face
CODE: TH-666

3/4" x 108' Double-Face
CODE: TH-400

3/4" x 180' Masking
CODE: TH-202

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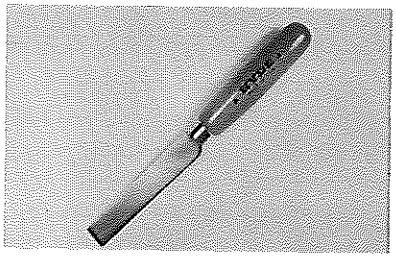
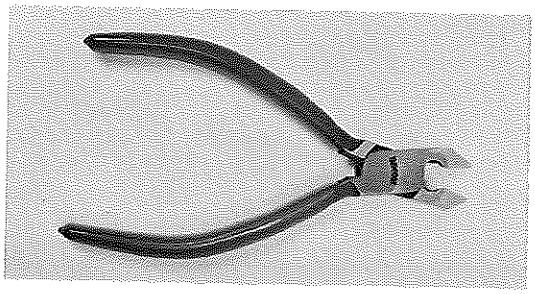


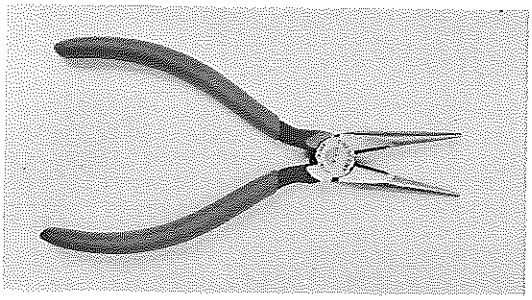
Leather Knife by HYDE. Square Point 4" Blade for cutting small Dia. Plastic Pipe.

CODE: TH-5053



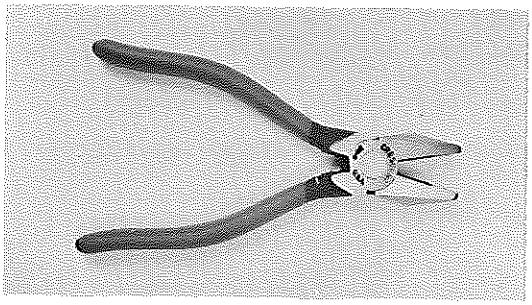
Flush-Cut Nippers by DIXON TOOLS. Ideal for cutting wire cored pipe. Drop Forged Diamalloy Jaw, Ground Flush and Hardened with Plastic Coated Handles.

CODE: TH-413



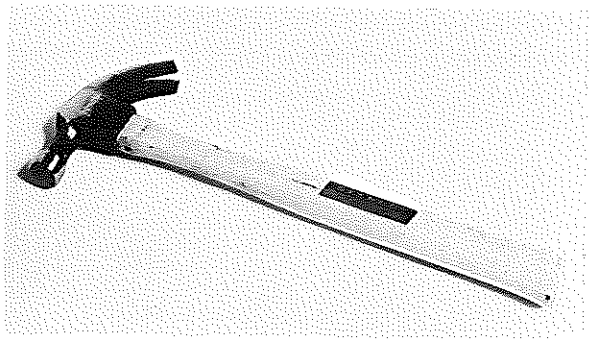
CRESCENT 6" Chain Nose Side Cut Pliers. Electronically Hardened Side Cutting Edges. Long Nose has Serrated Jaws. Has Cushion Comfort Grip.

CODE: TH-6546



CRESCENT 6" Lineman Side Cutting Pliers. Keen edged cutters with Spring Tempered Handles. Has Cushion Comfort Grip.

CODE: TH-506

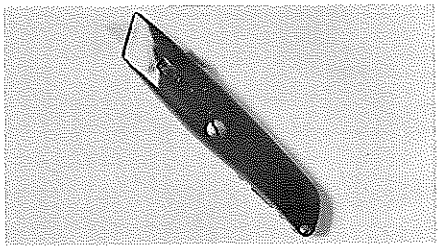


STANLEY 'JOBMASTER' Hammer with Heat-Treated Head. Curved Claw-Bell Face. Overall length 12". Weight 7 oz.

CODE: TH-103

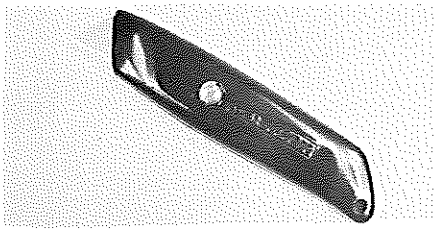
STANLEY Retractable Blade Utility Knife. Comes with replacement blades in handle. Blade has two exposed positions. See below for Replacement Blades.

CODE: TH-99



STANLEY Fixed Blade Utility Knife. Comes with replacement blades in handle. See below for Replacement Blades.

CODE: TH-299

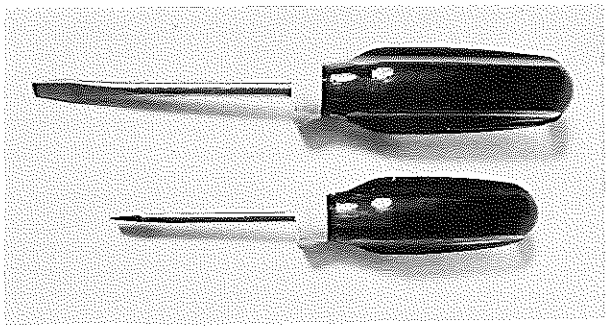


HEAVY DUTY REPLACEMENT BLADES FOR THE ABOVE STANLEY UTILITY KNIVES.
5 BLADES TO A PACKAGE.

CODE: TH-19925

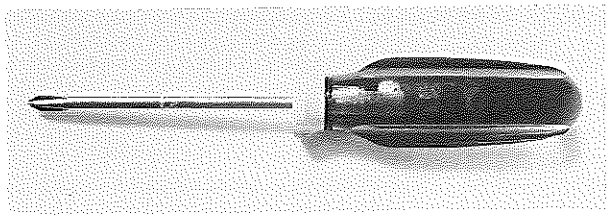
STANLEY Professional 3" & 4" Screwdrivers. High Strength Boron Steel Bar, Precision Cross Ground Tips.

3" x 7/32" BLADE
CODE: TH-66203
4" x 1/4" BLADE
CODE: TH-66204



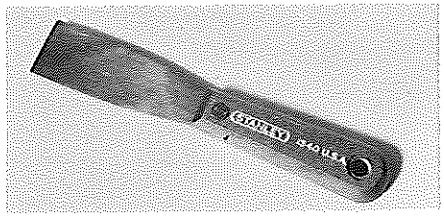
STANLEY Professional 4" Phillips Screwdriver. High Strength Alloy Steel Bar with Precision Cross Ground Tip. Comfort Handle.

CODE: TH-66302



STANLEY Putty Knife. Steel Blade Hardened, Tempered & Polished. Blade width 1-1/4". Hardwood Handle.

CODE: TH-1540



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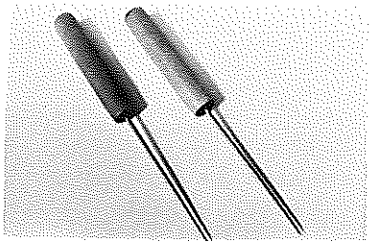
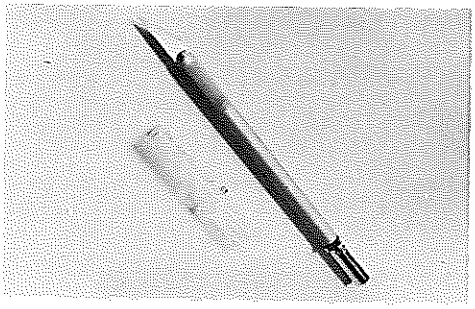


ICE PICKS.
Tempered Steel. 4-1/2" Long Spike, 8-1/2" Overall.

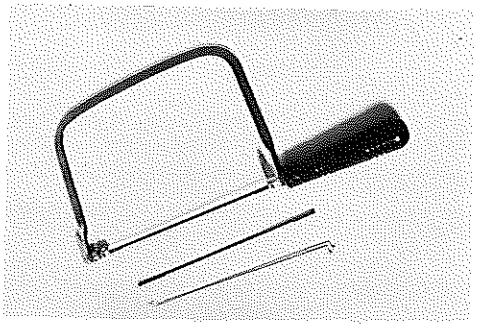
CODE: TH-30



X-ACTO SUPER KNIFE with Blade Shield. Flip-Lock Handle assures blade stability.

CODE: TH-3111

Package of 5 Fine, Sharp Point replacement blades.
CODE: TH-11

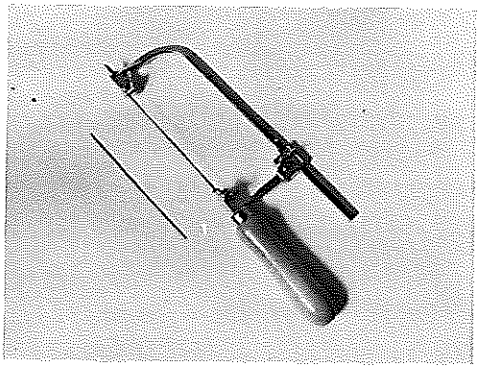


X-ACTO COPING SAW with 2 standard and 2 spiral blades. Blade length 5-1/4" long.

CODE: TH-44

Package of 5 Standard Blades.
CODE: TH-442

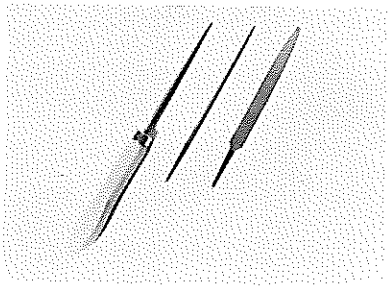
Package of 3 Spiral Blades.
CODE: TH-441



X-ACTO JEWELERS SAW with 2 blades. Accommodates blade lengths of 2" to 7-1/2". Saws in all directions.

CODE: TH-45

Replacement Blades — Package of 12
96 TOOTH: **CODE:** TH-16241
70 TOOTH: **CODE:** TH-16246
52 TOOTH: **CODE:** TH-16252
42 TOOTH: **CODE:** TH-16253



X-ACTO 3 STYLE FILE SET with Quick-Change, Comfort-Grip Handle.

CODE: TH-60

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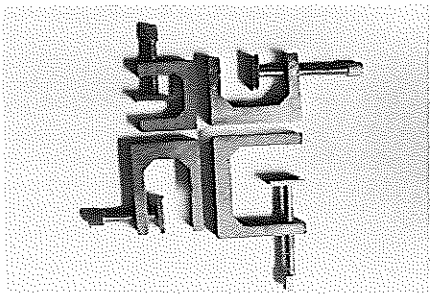
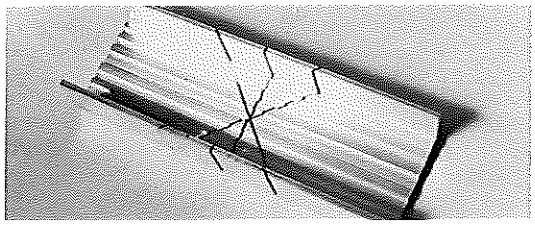
X-ACTO 'C' CLAMP SET made of Light Weight, High-Strength Magnesium with Steel Screws and Aluminum Lock Plates. 1 each of: 1-5/8" wide by 1" deep, 1-1/4" wide by 1-1/8" deep, 1" wide by 1" deep, 1-1/2" wide by 1-3/4" deep.

CODE: TH-46



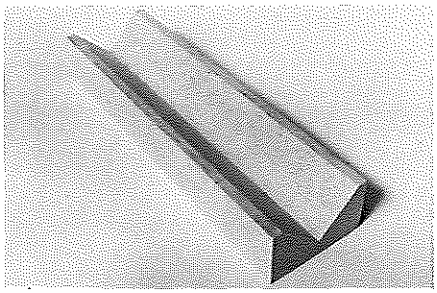
X-ACTO MITRE BOX of Extruded Aluminum. 3/4" x 1-3/4" Capacity, 6" long. One 90° & Two 45° Slots machined for precision accuracy.

CODE: TH-533



V-BLOCK
Hardwood Block 1-1/4" deep 'V'.
Dimensions: 11-1/2" long, 3-1/8" wide, 1-7/8" deep.

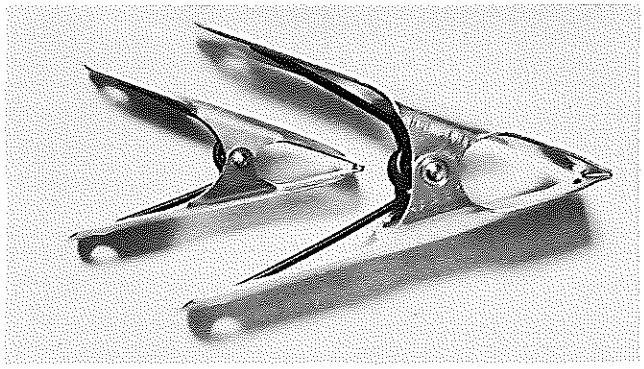
CODE: TH-250



Spring Clamps by GENERAL. Made of Zinc Plated Steel with Heavy Duty Springs. For quickly & firmly holding materials while cutting, machining, glueing or laminating.

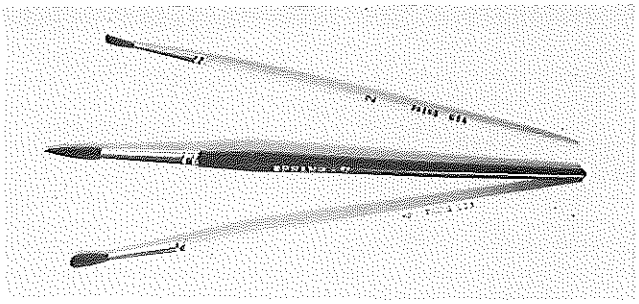
4" Long with 1" Opening
CODE: TH-8924

6" Long with 2" Opening
CODE: TH-8926



Three sizes of Artist Brushes for application of solvent cements or color touch-up with our Colormatch Paints.

SIZE #2 **CODE:** TH-2
SIZE #4 **CODE:** TH-4
SIZE #7 **CODE:** TH-7



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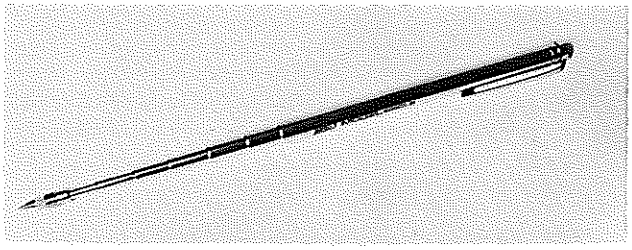
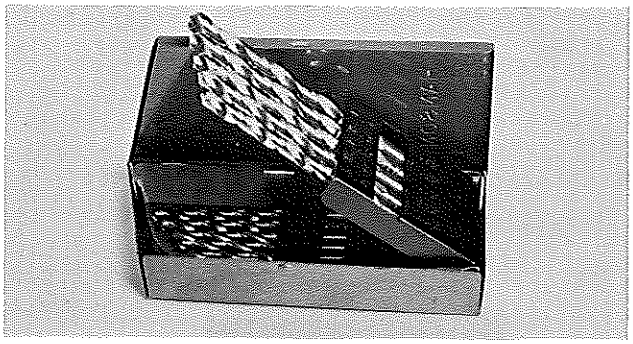


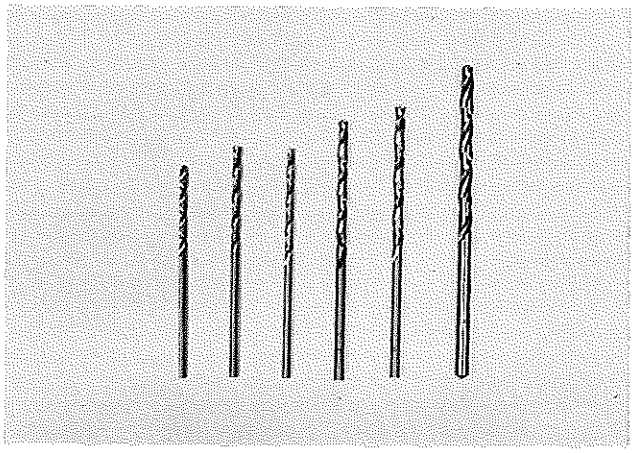
Telescoping Pocket Pen-Pointer.
Plastic Cap to cover Pen Point when not in use.
Extends from 5" to 24". Perfect for design floor and construction site discussions.

CODE: TH-200



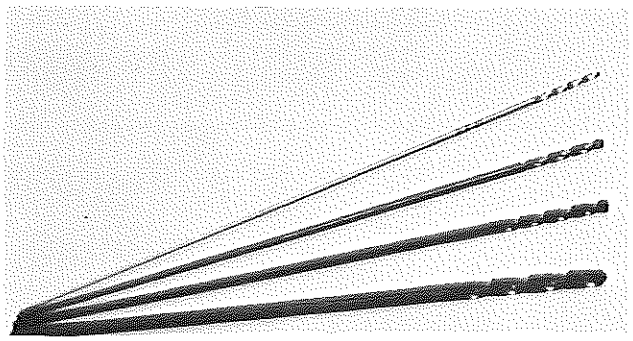
HANSON Fractional Drill Set.
13 Drill Sizes from 1/16" to 1/4". Full jobbers length, High Speed Steel in compact Steel Index Case.

CODE: TH-13



HANSON Numbered Twist Drill Bits.
High Speed Steel, Jobbers length with Straight Shank.

#30 CODE: TH-130
#41 CODE: TH-141
#43 CODE: TH-143
#50 CODE: TH-150
#51 CODE: TH-151
#54 CODE: TH-154
#56 CODE: TH-156



HANSON 12" Aircraft Drills.
High Speed Steel, Straight Shank.
135° Split Point with Treated Surface.

1/16" **CODE:** TH-1002
3/32" **CODE:** TH-1003
1/8" **CODE:** TH-1004
3/16" **CODE:** TH-1006
1/4" **CODE:** TH-1008
5/16" **CODE:** TH-1010
3/8" **CODE:** TH-1012

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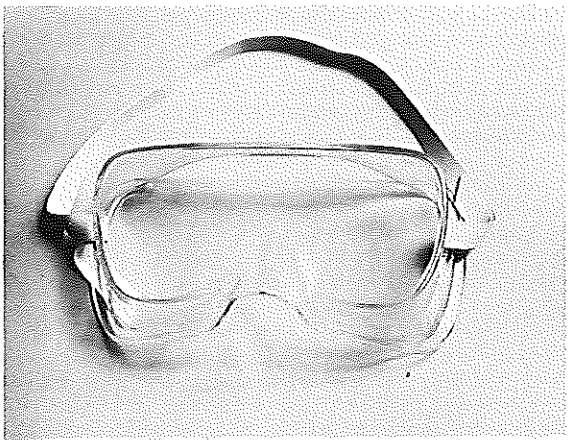
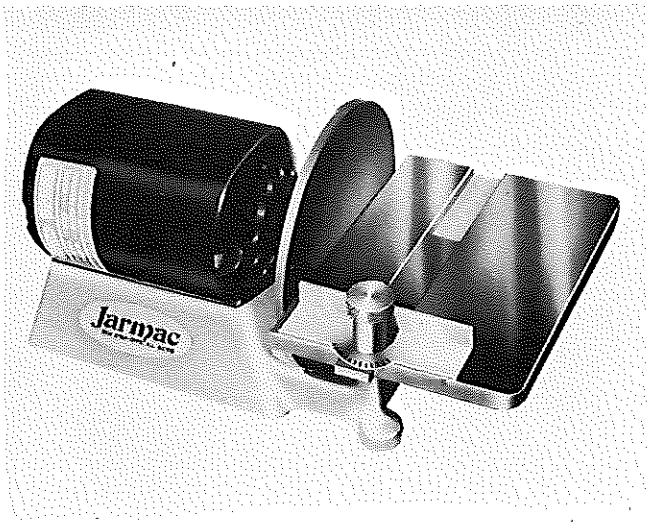
GENERAL One-Piece Plastic Goggles.
Non-Shatterable, Non-Fogging, may be worn over prescription glasses.

CODE: TH-931



JARMAC HOBBY DISC SANDER
This 4" Disc Sander is an excellent companion to the DREMEL Table Saw. Complete with adjustable cross guide. 115 V. 1/15 Horsepower, 5000 RPM. Rubber pads on feet.

CODE: TP-250



REPLACEMENT DISCS
3 to a pack

CODE: TP-252

Replacement 8" Sanding Disc
3M Brand, Adhesive Backed

CODE: TP-210

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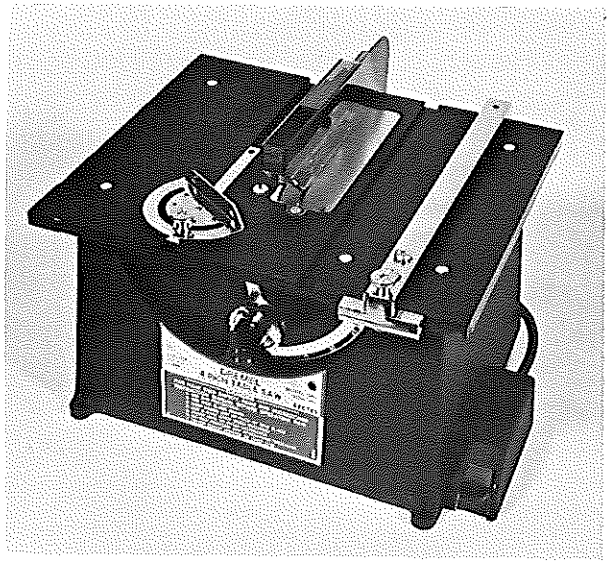
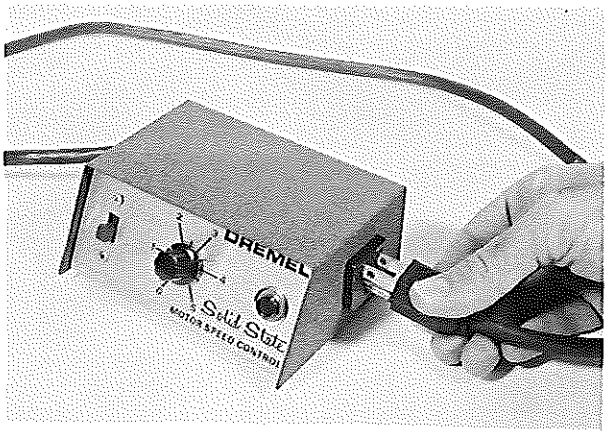


DREMEL 4" Model Makers Table Saw. . . .ideal for cutting and installing steel and piping. Equipped with adjustable cross guide, rip fence & blade guard. Tilting arbor adjusts from 0° to 45°. Overall size of 13"W x 11½"D x 8¾" with table top size of 12"W x 10"D. Maximum cutting capacity 1" in vertical position and 3/4" in 45° position. Blade capacity - 4" dia. 9800 RPM, 115 VAC, 60 Hertz, 2.2 amp. We suggest using our TP-104 or TP-105.

CODE: TP-160



DREMEL Motor Speed Control allows regulation of blade speed from 0 to 9800 RPM. May also be used with many other power tools.

CODE: TP-170

REPLACEMENT BLADES

4" x .040 Fine Tooth Blade	**CODE:** TP-104
4" x .064 Fine Tooth Blade	**CODE:** TP-105
6" x .064 Fine Tooth Blade	**CODE:** TP-106
4" x .065 Carbide	**CODE:** TP-114

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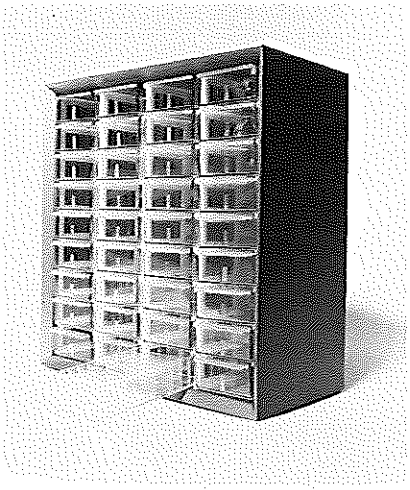
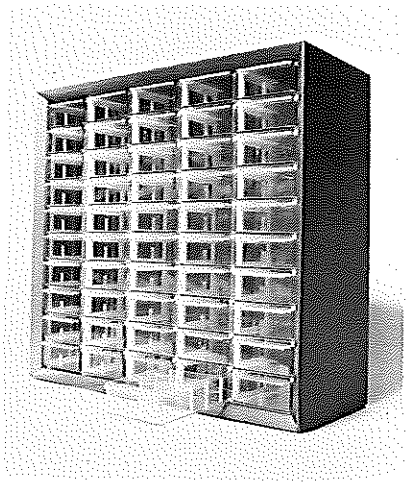
PARTS BINS



PORTABLE 36 DRAWER CABINET.
Cabinet Measures 13"W x 13½"H x 6½"D.

CODE: TD-36

"UNITIZED" STEEL FRAMES WITH BLUE CHIP–PROOF ENAMEL FINISH. TRANSPARENT STYRENE DRAWERS MEASURE 2¾"W x 1¼"H x 5¾"D AND DIVIDE INTO 2 OR 3 SUB-COMPARTMENTS. BOTH ARE DESIGNED TO ADD & STACK MORE CABINETS AS NEEDED.



PORTABLE 50 DRAWER CABINET.
Cabinet Measures 16"W x 15"H x 6½"D.

CODE: TD-50

REPLACEMENT DRAWERS FOR EITHER CABINET.
CODE: TD-120

CROSS DRAWER DIVIDERS. PACKAGE OF 25.
CODE: TD-125

TOOL BOX

2 Drawer Tool Box with top compartment. Drawers have full suspension slides and automatically lock when cover is closed. Top compartment 2⅞" x 20" x 9½". Drawers are 2" x 20" x 9½". Overall size 20"W x 9½"D x 8½"H. Gray enameled finish with red drawers.

CODE: TC-1

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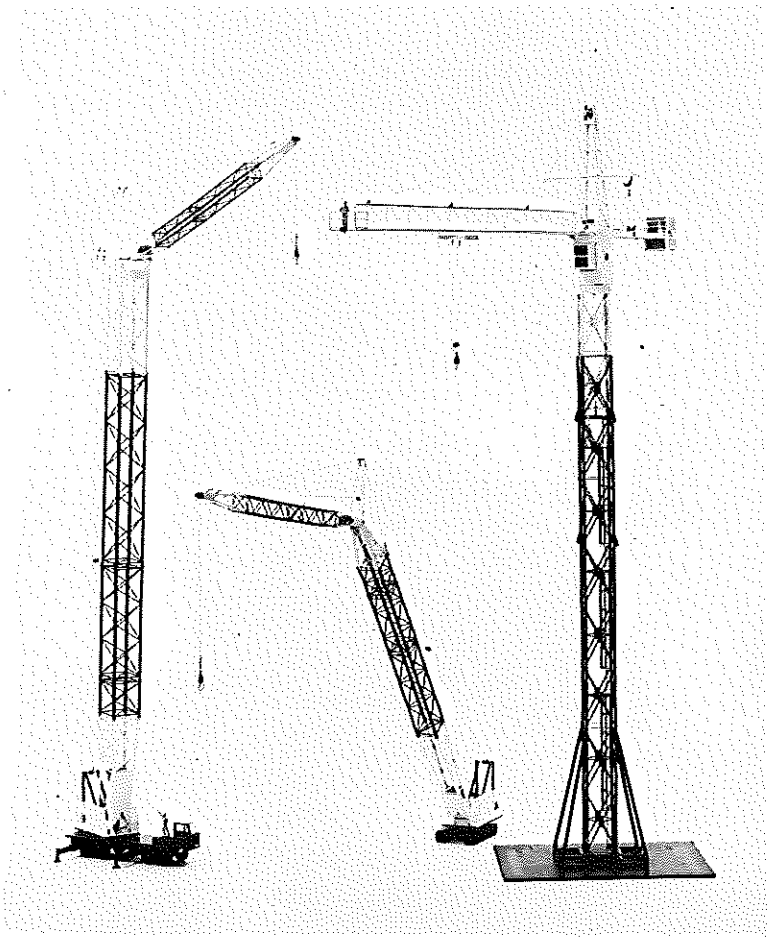
NEXT SYSTEM BEGINS ON PAGE 329.

GET THE MOST OUT OF YOUR CONSTRUCTION PLANNING....

If you are designing with models these construction equipment kits are a necessity.

* For Preliminary Models
* To insure proper size construction equipment
* Determine erection sequences
* Check ground clearances
* Insure accessability
* Plan maintenance procedures



Four industrial Crane Kits available in the most popular scales: 1/4", 3/8", 1/2" and 3/4" = 1'-0" — All adjustable and with removable sections.

* **CRAWLER CRANE** 80—10 Ton w/85' — 35' extra reach jib
* **RUBBER TIRED CRANE** 80—10 Ton w/85' — 35' extra reach jib
* **RUBBER TIRED TOWER CRANE** 115—100 Ton Heavyweights w/385' — 165' Tower
* **TOWER CRANE** 20,000 lbs.

Assembling these kits can be a useful exercise for a trainee — or an enjoyable task for a more experienced model technician.

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CONSTRUCTION EQUIPMENT KITS

CRAWLER CRANE

CODE	SCALE
CEK-108	1/4" = 1'-0" 1:48
CEK-112	3/8" = 1'-0" 1:32
CEK-116	1/2" = 1'-0" 1:24
CEK-124	3/4" = 1'-0" 1:16

RUBBER TIRED TOWER CRANE

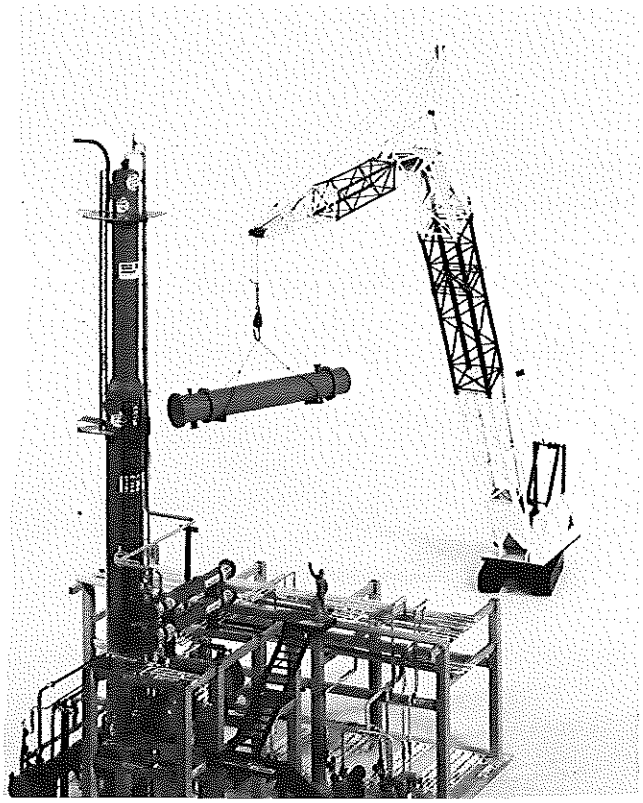
CODE	SCALE
CEK-208	1/4" = 1'-0" 1:48
CEK-212	3/8" = 1'-0" 1:32
CEK-216	1/2" = 1'-0" 1:24
CEK-224	3/4" = 1'-0" 1:16

RUBBER TIRED CRANE

CODE	SCALE
CEK-308	1/4" = 1'-0" 1:48
CEK-312	3/8" = 1'-0" 1:32
CEK-316	1/2" = 1'-0" 1:24
CEK-324	3/4" = 1'-0" 1:16

TOWER CRANE

CODE	SCALE
CEK-408	1/4" = 1'-0" 1:48
CEK-412	3/8" = 1'-0" 1:32
CEK-416	1/2" = 1'-0" 1:24
CEK-424	3/4" = 1'-0" 1:16



EACH KIT CONTAINS:

1. A complete set of detailed drawings.
2. Pertinent illustrations to facilitate construction.
3. Complete bill of material.
4. All materials are included except for cab and truck frames.
5. Templates for easy construction of cab and truck.

All drawings are in 3/8" = 1'-0" scale.

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Model Procedure Manual—details the work flow of successful design model programs from concept to shipping. The purpose of the manual is two-fold: to assist industry in establishing, operating and controlling the design model function, and to give educators a comprehensive view of industry's requirements.

Subjects covered include:

- Types and uses of engineering models
- Model descriptions
- Model facility requirements and considerations
- Personnel selection, training and duties
- Estimating
- Model specifications
- Preliminary/study model
- Information flow and model chronology
- Basic and design models
- Tagging, checking and model reviews
- Photography
- Model finalization, crating and shipping
- Index of raw materials

CODE: MAN-01

Design Model Training Manual—explains the uses and limitations of models as an engineering tool.

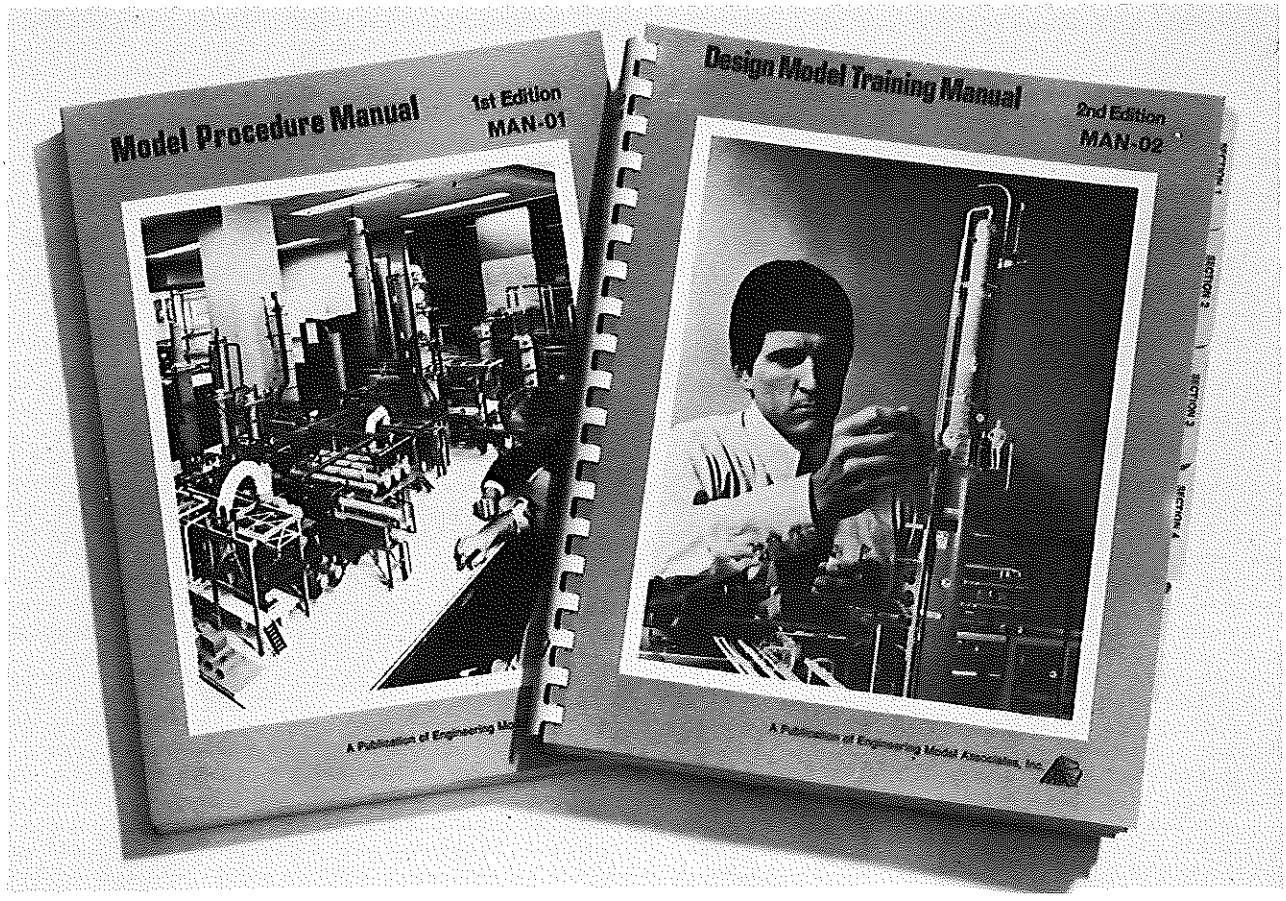
Its goals are to enable students to:

- Become familiar with the uses of design models
- Think in three dimensions
- Fulfill industry requirements
- Broaden the individual's piping background
- Earn an AA degree in piping design

The training manual includes detailed instructions for:

- Safety and housekeeping
- Model components, catalogs and supplies
- Use of solvents and tools
- Modeling procedures
- Model base layout
- Simple jigs for constructing pipe bents and structures
- Construction of pipeway and equipment structures
- Construction of stabilizer column and pumps
- Construction of horizontal vessel and heat exchangers
- Location and attachment of components to model base
- Pipe bending and fabrication
- Working and thinking in three dimensions
- Construction of piping model
- Evaluation of student's model and final examination

CODE: MAN-02



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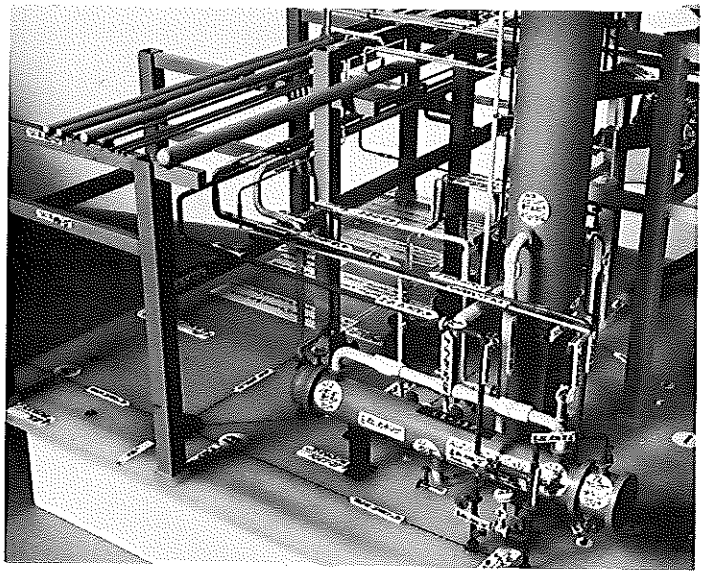
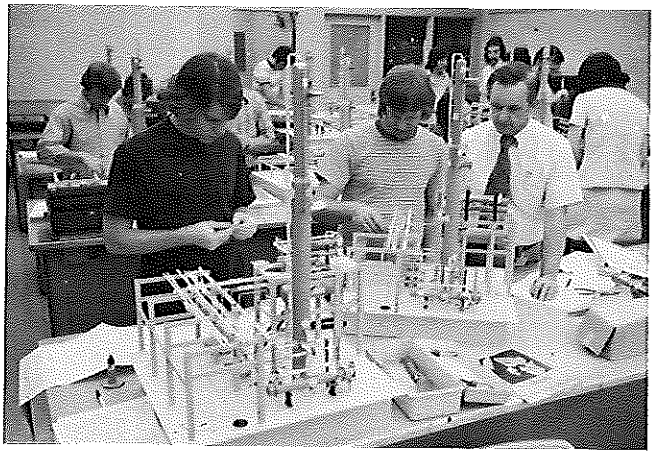
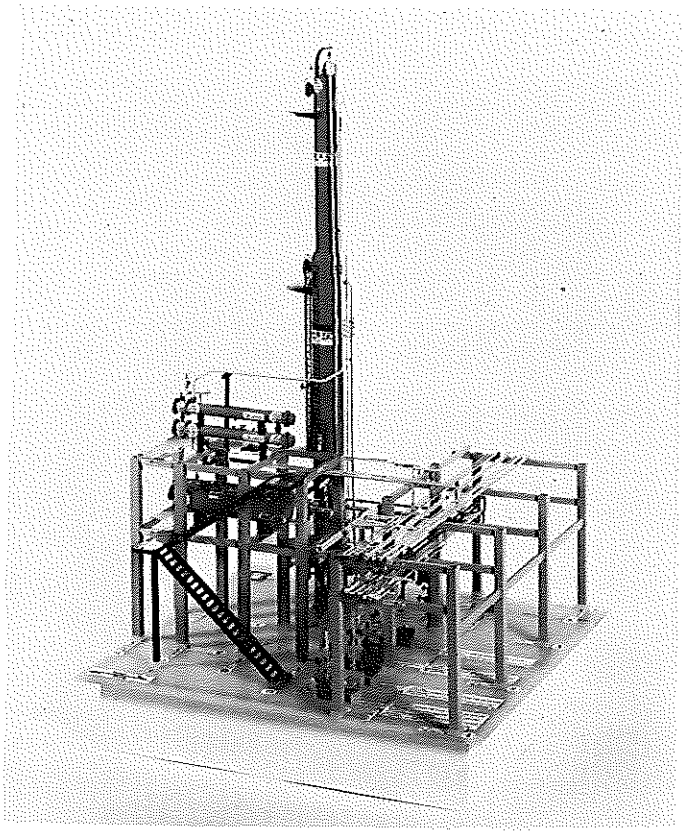


Design Model Training Kit — functions as a step-by-step companion to the training manual. The kit contains all the components necessary for the student to gain essential experience by constructing—according to instructions in the manual— an exact prototype of a professional piping design model.

CODE: KIT-02





For more detailed information, please write for an EMA Educational Brochure.

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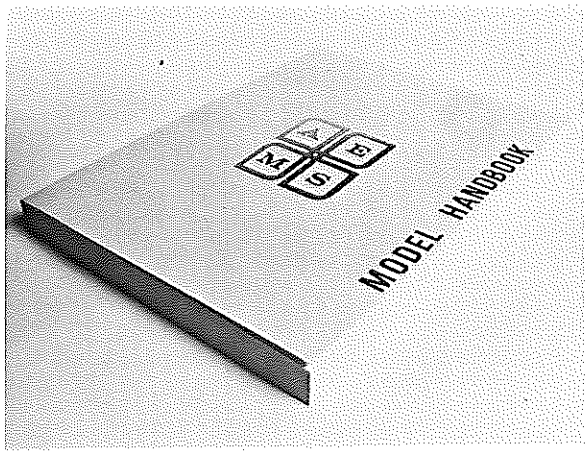

AMERICAN ENGINEERING MODEL SOCIETY

MODEL HANDBOOK

The Material in this Handbook represents the efforts of many individuals and organizations throughout the world. Many topics in this Handbook will be common to all.

CODE: MAN-100

E.M.A. REPORTER

News of, by and for, Engineering Model Designers

The E.M.A. REPORTER is a quarterly newsletter published by Engineering Model Associates, Inc. for its worldwide customers and employees. The information and articles appearing therein deal with subjects particularly relevant to the engineering scale model industry; promoting model building programs and specific efforts of our customers as well as information concerning EMA's varied activities and personnel.

We welcome articles and photographs which you are willing to share with our industry, and we will provide full credits to contributing companies and individuals. We welcome, too, your comments and suggestions, not just relating to the REPORTER, but also concerning EMA's products and varied services.

Please advise us if you wish to have your name entered on our mailing list to regularly receive the EMA REPORTER. Indicate also if you would like additional copies of our Catalog, our Information & Data File or any other modeling information. We would be happy to comply.

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NEXT SYSTEM BEGINS ON PAGE 381.

AVAILABLE FROM EMA SERVICES, THOROFARE, NEW JERSEY

VARIABLE STRUCTURAL ASSEMBLIES

WIDTH OF FLANGE	DEPTH OF BEAM										
	7/8"	1"	1-1/8"	1-1/4"	1-3/8"	1-1/2"	1-5/8"	1-3/4"	1-7/8"	2"	2-1/8"
3/8"	1228	1232	1236	1240	1244	1248	1252	1256	1260	1264	1268
7/16"	1428	1432	1436	1440	1444	1448	1452	1456	1460	1464	1468
1/2"	1628	1632	1636	1640	1644	1648	1652	1656	1660	1664	1668
9/16"	1828	1832	1836	1840	1844	1848	1852	1856	1860	1864	1868
5/8"	2028	2032	2036	2040	2044	2048	2052	2056	2060	2064	2068
11/16"	2228	2232	2236	2240	2244	2248	2252	2256	2260	2264	2268
3/4"	2428	2432	2436	2440	2444	2448	2452	2456	2460	2464	2468
7/8"	2828	2832	2836	2840	2844	2848	2852	2856	2860	2864	2868
15/16"	3028	3032	3036	3040	3044	3048	3052	3056	3060	3064	3068
1"	3228	3232	3236	3240	3244	3248	3252	3256	3260	3264	3268
1-1/8"	3628	3632	3636	3640	3644	3648	3652	3656	3660	3664	3668
1-1/4"	4028	4032	4036	4040	4044	4048	4052	4056	4060	4064	4068

Select required Flange Width and Depth of Beam from above Table. The Box which is the junction of both columns will indicate the Code Number. The Prefix to the Code Number is 'SVA'.

EXAMPLE: The required Beam is to have a 3/4" Flange Width x 1-7/8" Deep (30" Beam with a 12" Flange in 3/4" = 1'-0" Scale). The Box that is the junction of both columns is;

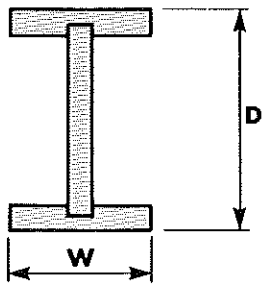
2460

SVA-2460 = **CODE**

If Clear is desired add 'C' to end of code.

EXAMPLE: SVA-2460C

Special sizes and lengths up to 5' will be quoted upon request.



All 30" Long

MATERIAL — COLOR

ABS — Steel Gray
Acrylic — Clear

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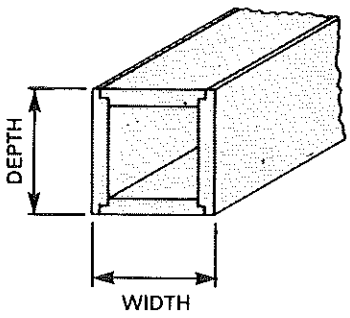
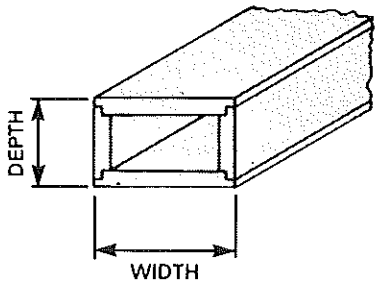
SPECIAL PRODUCTS AND SERVICES

AVAILABLE FROM EMA SERVICES, THOROFARE, NEW JERSEY

VARIABLE HVAC DUCTING & FIREPROOF MEMBERS





DEPTH	WIDTH											
	3/4"	13/16"	7/8"	15/16"	1"	1-1/16"	1-1/8"	1-3/16"	1-1/4"	1-5/16"	1-3/8"	1-7/16"
2-1/4"	2472	—	2872	—	3272	—	3672	—	4072	—	4472	—
2-3/16"	—	—	2870	3070	3270	3470	3670	3870	4070	4270	4470	4670
2-1/8"	2468	2668	2868	3068	3268	3468	3668	3868	4068	4268	4468	4668
2-1/16"	—	2666	2866	3066	3266	3466	3666	3866	4066	4266	4466	4666
2"	2464	2664	2864	3064	3264	3464	3664	3864	4064	4264	4464	4664
1-15/16"	—	2662	2862	3062	3262	3462	3662	3862	4062	4262	4462	4662
1-7/8"	2460	2660	2860	3060	3260	3460	3660	3860	4060	4260	4460	4660
1-13/16"	—	2658	2858	3058	3258	3458	3658	3858	4058	4258	4458	4658
1-3/4"	2456	2656	2856	3056	3256	3456	3656	3856	4056	4256	4456	4656
1-11/16"	—	2654	2854	3054	3254	3454	3654	3854	4054	4254	4454	4654
1-5/8"	2452	2652	2852	3052	3252	3452	3652	3852	4052	4252	4452	4652
1-9/16"	—	2650	2850	3050	3250	3450	3650	3850	4050	4250	4450	4650
1-1/2"	2448	2648	2848	3048	3248	3448	3648	3848	4048	4248	4448	4648
1-7/16"	—	2646	2846	3046	3246	3446	3646	3846	4046	4246	4446	4646
1-3/8"	2444	2644	2844	3044	3244	3444	3644	3844	4044	4244	4444	
1-5/16"	—	2642	2842	3042	3242	3442	3642	3842	4042	4242		
1-1/4"	2440	2640	2840	3040	3240	3440	3640	3840	4040			
1-3/16"	—	2638	2838	3038	3238	3438	3638	3838				
1-1/8"	2436	2636	2836	3036	3236	3436	3636					
1-1/16"	—	2634	2834	3034	3234	3434						
1"	2432	2632	2832	3032	3232							
15/16"	—	2630	2830	3030								
7/8"	2428	2628	2828									
13/16"	—	2626										

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VARIABLE HVAC DUCTING & FIREPROOF MEMBERS

Select required Depth and Width of the Square or Rectangular member from the appropriate table. The box which is the junction of both columns will indicate the Code Number. The Prefix to the Code Number is 'DVA'.

EXAMPLE: The required Depth is 7/8" and the Width is 1-1/4".
The box that is the junction of both columns is:

2840

DVA-2840 =Code

Add Color Designation to End of Code:

COLOR	COLOR CODE	MATERIAL
Concrete Gray	CG	ABS
Vessel & Equipment Gray	VE	ABS
Clear	C	Acrylic
Transparent Blue	TB	Acrylic

Using Above Example:

DVA-2840VE = Code

All 30" Long

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DEPTH	WIDTH											
	1-1/2"	1-9/16"	1-5/8"	1-11/16"	1-3/4"	1-13/16"	1-7/8"	1-15/16"	2"	2-1/16"	2-1/8"	2-3/16"
1-1/2"	4848											
1-9/16"	4850	5050										
1-5/8"	4852	5052	5252									
1-11/16"	4854	5054	5254	5454								
1-3/4"	4856	5056	5256	5456	5656							
1-13/16"	4858	5058	5258	5458	5658	5858						
1-7/8"	4860	5060	5260	5460	5660	5860	6060					
1-15/16"	4862	5062	5262	5462	5662	5862	6062	6262				
2"	4864	5064	5264	5464	5664	5864	6064	6264	6464			
2-1/16"	4866	5066	5266	5466	5666	5866	6066	6266	6466	6666		
2-1/8"	4868	5068	5268	5468	5668	5868	6068	6268	6468	6668	6868	
2-3/16"	4870	5070	5270	5470	5670	5870	6070	6270	6470	6670	6870	7070
2-1/4"	4872	—	5272	—	5672	—	6072	—	6472	—	6872	—

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AVAILABLE FROM EMA SERVICES,
THOROFARE, NEW JERSEY

THE EMA STANDARD MODEL TABLE

The most economical and unquestionably the most professional model table available anywhere!

Engineers know that any good project—including the engineering model—is only as good as the foundation on which it rests. To successfully support the costly engineering model, the model table must possess certain important qualities. It can neither warp nor sag, nor can it rack when lifted. The table must maintain dimensional stability and ensure the security of structural joints. And it must look as professional as the engineering model it holds.

It is the EMA Standard Model Table.

The Standard Model Table continues EMA's 20-year tradition of providing industry leaders with the latest innovations in engineering model components and supplies. Available in a wide range of sizes, the table is designed specifically to accommodate the sophisticated, expensive engineering model. Every consideration has been given to function, reliability, appearance and cost. With its rugged construction, this table will surely surpass any design criteria you may require.

Users of the EMA Standard Model Table call it "the most economical and unquestionably the most professional model table available anywhere!"

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AVAILABLE FROM EMA SERVICES, THOROFARE, NEW JERSEY

CONSTRUCTION

FRAME—Each EMA Standard Model Table consists of an all-steel welded and riveted folding leg chassis and a 14-gauge tubular steel grid platen. Square 1½-inch tubular steel legs can be fitted with optional casters or extenders.

The combination of all-steel chassis and a welded grid results in a strong and rigid understructure that provides maximum strength and minimal racking. The understructure—not the table top—absorbs stress and strain. Moreover, the finished EMA table weighs no more than a comparable wooden table.

A sturdy, secure spring lock holds the legs in an upright position. In addition, tables are equipped with a fast-pin locking device to further ensure safety. No more removing legs for shipping or photographing. Just unlock and fold them under.

TOP—Plexiglas and plywood form the table top work surface. Plexiglas, 3/16-inch thick, facilitates attachment of structures and equipment with solvent cement, rather than with screws or bolts. Fastened to the understructure, a 5/8-inch thick exterior grade plywood underlayment is primed on both sides and painted concrete gray to maintain continuity of color code.

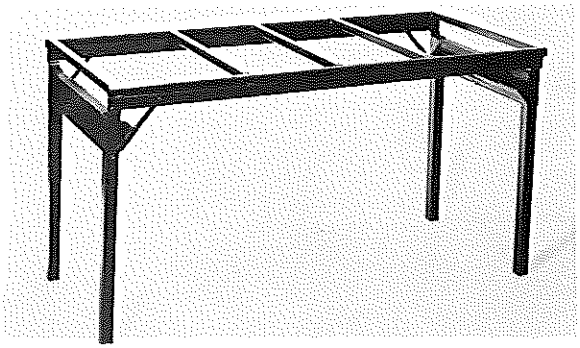
ADVANTAGES

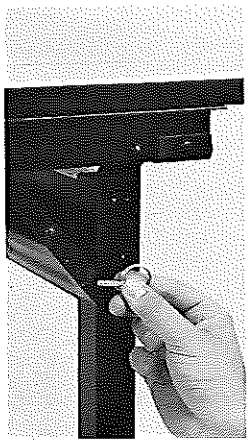
1. Table components stocked and ready for rapid assembly and delivery.
2. A price structure equal to or better than others in our industry.
3. Options for different top surfaces.
4. Finest quality construction to properly support high investment models.
5. Constructed to eliminate warping and racking which can cause breaking of model joints.
6. Folding and locking legs, rather than troublesome, time-consuming removable legs.
7. Options for attaching glides, levelers or casters.
8. Wide range of sizes and configurations.
9. As professional in appearance as the engineering model.
10. Most practical surface for model mounting and attaching.
11. Consideration for continuity of color coding.

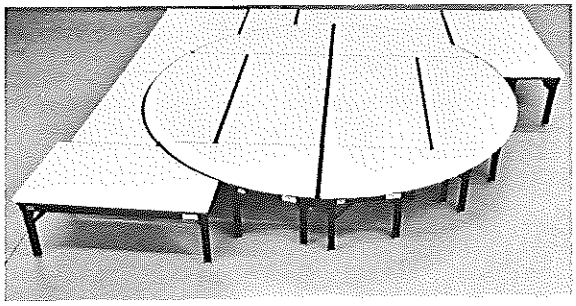
FOR NUCLEAR. . .

To meet the needs of the nuclear power plant modeling field, EMA Services offers the EMA Special Model Table. It is specifically designed for the nuclear field and results from months of cooperation between Services technicians and representatives of several major engineering firms.

Nuclear power models require a variety of table shapes to accommodate the intricate splits used in the models—round, dog-legged, U-shaped, as well as the standard rectangular configuration. Each special model table is constructed to support the greater loads usually found in power models. Comfortable working heights can be maintained by use of table extenders, also available from EMAS.







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SPECIAL PRODUCTS AND SERVICES

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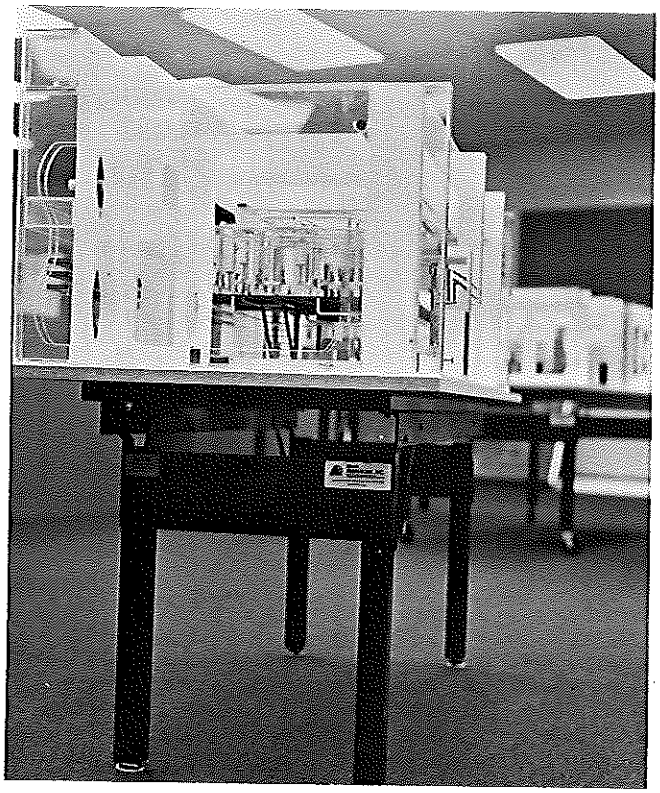
OPTIONS

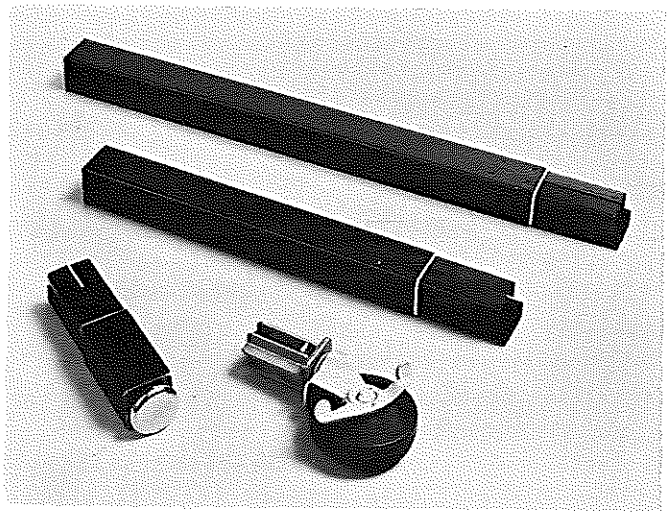
1. STANDARD EMA TABLE—Metal folding leg chassis with welded tubular steel grid platen. Top of 3/16-inch thick clear plexiglas sheet with matte finish. Underlayment of 5/8-inch thick exterior grade plywood, primed on both sides and painted EMA concrete gray. Adjustable levelers included.

2. STANDARD WHITE PLEX TOP TABLE—Metal folding leg chassis with welded tubular steel grid platen. Top of 3/16-inch thick white plexiglas sheet with matte finish. Underlayment of 5/8-inch thick exterior grade plywood, primed on both sides and painted white. Adjustable levelers included.

3. SPECIAL CONFIGURATIONS—Shaped according to customer-supplied specifications and constructed with all EMA table features. Metal folding leg chassis with welded tubular steel grid platen. Top of 3/16-inch thick clear or white matte finish plexiglas. Underlayment of 5/8-inch thick exterior grade plywood, primed on both sides and painted white or concrete gray.



EMA Standard Table with section of power plant model.



Standard leveler with optional extenders and casters.

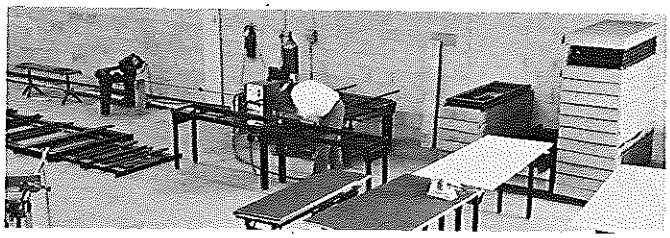


Table assembly area at EMA Services

See price list for typical sizes. For special sizes or configurations or to order tables please contact:

EMA SERVICES, INC.

Industrial Model Supplies and Services
A Subsidiary of Engineering Model Associates, Inc.

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