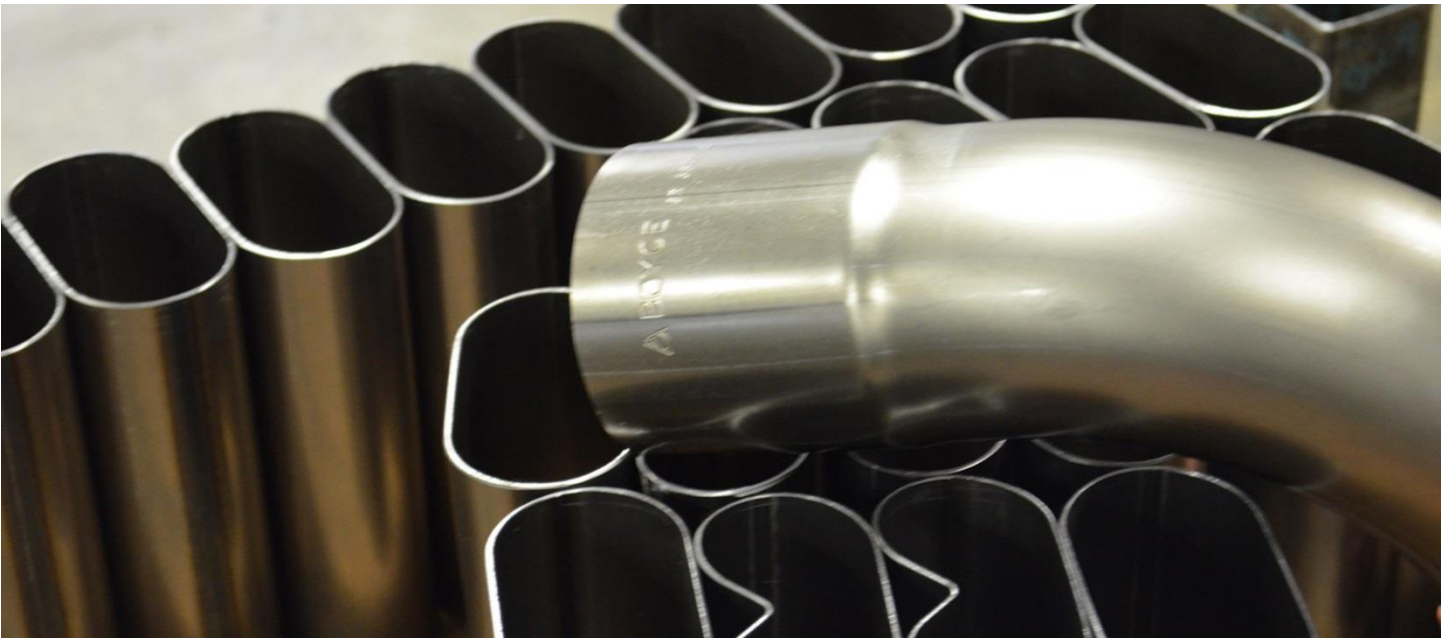


BOYCE

INDUSTRIES



In March of 2019, members of A.E.D. Motorsport Products (Indianapolis, IN) and McKinney Corporation (Lafayette, IN) purchased Boyce Industries. For more than 50 years, Boyce Industries has been a performance-oriented company providing high-quality products and services used in motorsports, offering custom and contract tube bending services to motorsports and commercial customers alike. In the mid-1980s, Boyce developed a complete oval steel tube exhaust system for competition use in NASCAR. This was followed by oval track muffler development and boom tube exhaust outlets. Boyce is also a major supplier of complete vehicle frame sections and private label race products.

Both A.E.D. and McKinney are recognized leaders in the performance, automotive, aviation, and aerospace industries, and both companies are certified ISO 9001-2015. These quality practices will be implemented in the new organization. The Boyce Industries brand name will be retained, and services will continue as in the past.

Boyce Industries relocated from its longtime home in Melrose Park, IL, to Indianapolis, IN to best utilize the resources and capabilities of both A.E.D. Motorsport and McKinney Corp.

Under the new ownership, Boyce Industries will continue to specialize in custom and contract tube bending, tube reshaping, and tube end finishing services, such as cutting, expanding, reducing, notching, drilling, and custom welding.

Al Lowe | President

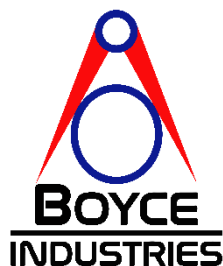




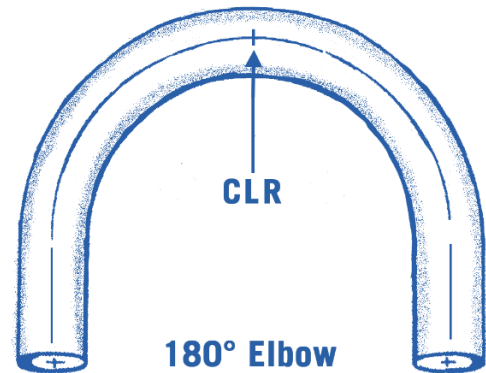
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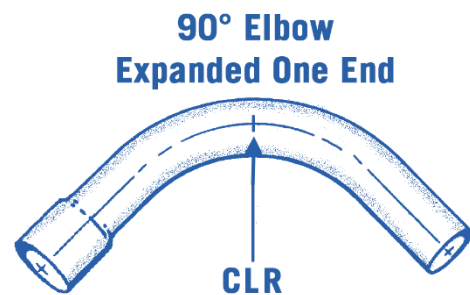


ROUND STEEL ELBOWS

<i>180° ELBOWS</i>		
PART #	DESCRIPTION	CLR
LR25180	2-1/2" O.D. Long Radius	10"
SR25180	2-1/2" O.D. Short Radius	5"
TR25180	2-1/2" O.D. Tight Radius	2-1/2"
LR225180	2-1/4" O.D. Long Radius	5-1/2"
SR225180	2-1/4" O.D. Short Radius	4"
TR225180	2-1/4" O.D. Tight Radius	3"
LR20180	2" O.D. Long Radius	6"
SR20180	2" O.D. Short Radius	4"
TR20180	2" O.D. Tight Radius	3"
LR187180	1-7/8" O.D. Long Radius	4-1/2"
SR187180	1-7/8" O.D. Short Radius	4"
TR187180	1-7/8" O.D. Tight Radius	3"
LR175180	1-3/4" O.D. Long Radius	4-1/2"
SR175180	1-3/4" O.D. Short Radius	3-1/2"
TR175180	1-3/4" O.D. Tight Radius	2-1/2"
LR15180	1-1/2" O.D. Long Radius	4"
SR15180	1-1/2" O.D. Short Radius	3-1/2"
TR15180	1-1/2" O.D. Tight Radius	2-1/2"



<i>90° ELBOWS</i>		
PART #	DESCRIPTION	CLR
LR4090E	4" O.D. Long Radius – Expanded One End	10"
SR4090E	4" O.D. Short Radius – Expanded One End	6"
LR3590E	3-1/2" O.D. Long Radius – Expanded One End	9"
SR3590E	3-1/2" O.D. Short Radius – Expanded One End	5-1/4"
LR3090E	3" O.D. Long Radius – Expanded One End	6"
SR3090E	3" O.D. Short Radius – Expanded One End	4-1/2"
LR2590E	2-1/2" O.D. Long Radius – Expanded One End	10"
SR2590E	2-1/2" O.D. Short Radius – Expanded One End	5"
TR2590	2-1/2" O.D. Tight Radius	2-1/2"
LR22590	2-1/4" O.D. Long Radius	5-1/2"
SR22590	2-1/4" O.D. Short Radius	4"
TR22590	2-1/4" O.D. Tight Radius	3"
LR2090	2" O.D. Long Radius	6"
SR2090	2" O.D. Short Radius	4"
TR2090	2" O.D. Tight Radius	3"



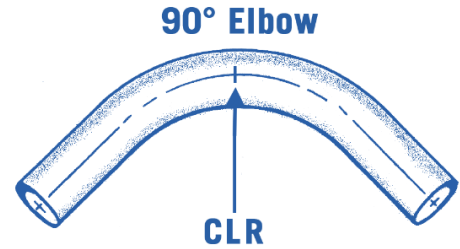
ALL ELBOWS ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA) MILD STEEL ROUND TUBE
 BENDS ON SHORT RADIUS (SR) ELBOWS WILL NEST INSIDE BENDS ON LONG RADIUS (LR) ELBOWS
 ELBOWS WITH EXPANDED ENDS MAY ALSO BE AVAILABLE WITHOUT EXPANDED ENDS (PART NO'S ENDING IN "E")
 MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 NO PART IS GUARANTEED TO BE IN STOCK



ROUND STEEL ELBOWS

90° ELBOWS cont.

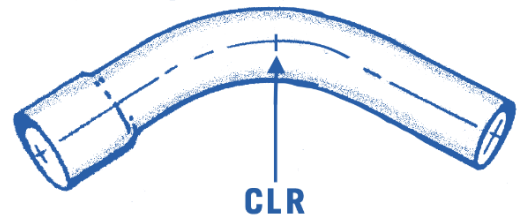
PART #	DESCRIPTION	CLR
LR18790	1-7/8" O.D. Long Radius	4-1/2"
SR18790	1-7/8" O.D. Short Radius	4"
TR18790	1-7/8" O.D. Tight Radius	3"
LR17590	1-3/4" O.D. Long Radius	4-1/2"
SR17590	1-3/4" O.D. Short Radius	3-1/2"
TR17590	1-3/4" O.D. Tight Radius	2-1/2"
LR16390	1-5/8" O.D. Long Radius	4-3/8"
SR16390	1-5/8" O.D. Short Radius	4"
TR16390	1-5/8" O.D. Tight Radius	2-1/2"
LR1590	1-1/2" O.D. Long Radius	4"
SR1590	1-1/2" O.D. Short Radius	3-1/2"
TR1590	1-1/2" O.D. Tight Radius	2-1/2"



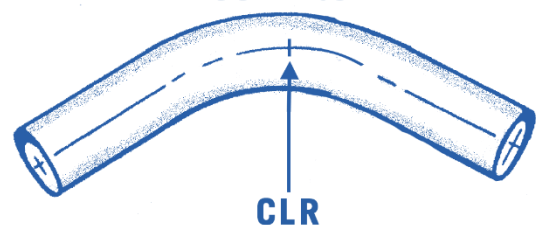
60° ELBOWS

PART #	DESCRIPTION	CLR
LR4060E	4" O.D. Long Radius – Expanded One End	10"
SR4060E	4" O.D. Short Radius – Expanded One End	6"
LR3560E	3-1/2" O.D. Long Radius – Expanded One End	9"
SR3560E	3-1/2" O.D. Short Radius – Expanded One End	5-1/4"
LR3060E	3" O.D. Long Radius – Expanded One End	6"
SR3060E	3" O.D. Short Radius – Expanded One End	4-1/2"
LR2560E	2-1/2" O.D. Long Radius – Expanded One End	10"
SR2560E	2-1/2" O.D. Short Radius – Expanded One End	5"
TR2560	2-1/2" O.D. Tight Radius	2-1/2"
LR22560	2-1/4" O.D. Long Radius	5-1/2"
SR22560	2-1/4" O.D. Short Radius	4"
TR22560	2-1/4" O.D. Tight Radius	3"
LR2060	2" O.D. Long Radius	6"
SR2060	2" O.D. Short Radius	4"
TR2060	2" O.D. Tight Radius	3"
LR18760	1-7/8" O.D. Long Radius	4-1/2"
SR18760	1-7/8" O.D. Short Radius	4"
TR18760	1-7/8" O.D. Tight Radius	3"
LR17560	1-3/4" O.D. Long Radius	4-1/2"
SR17560	1-3/4" O.D. Short Radius	3-1/2"
TR17560	1-3/4" O.D. Tight Radius	2-1/2"

60° Elbow
Expanded One End



60° Elbow



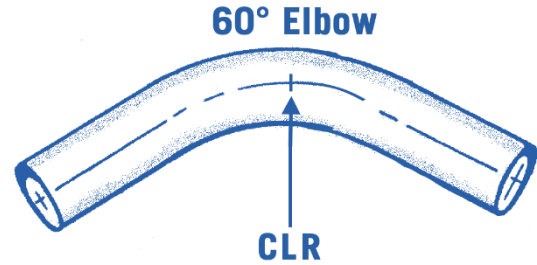
ALL ELBOWS ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA) MILD STEEL ROUND TUBE
 BENDS ON SHORT RADIUS (SR) ELBOWS WILL NEST INSIDE BENDS ON LONG RADIUS (LR) ELBOWS
 ELBOWS WITH EXPANDED ENDS MAY ALSO BE AVAILABLE WITHOUT EXPANDED ENDS (PART NO'S ENDING IN "E")
 MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 NO PART IS GUARANTEED TO BE IN STOCK



ROUND STEEL ELBOWS

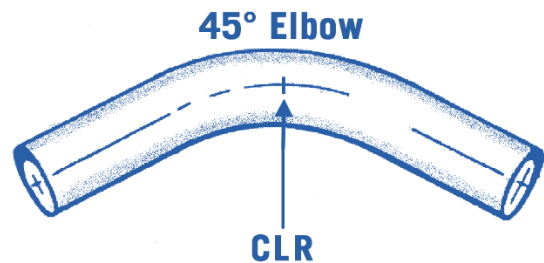
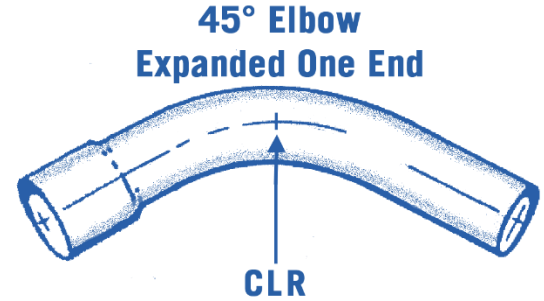
60° ELBOWS cont.

PART #	DESCRIPTION	CLR
LR16360	1-5/8" O.D. Long Radius	2-1/2"
SR16360	1-5/8" O.D. Short Radius	4-3/8"
TR16360	1-5/8" O.D. Tight Radius	4"
LR1560	1-1/2" O.D. Long Radius	4"
SR1560	1-1/2" O.D. Short Radius	3-1/2"
TR1560	1-1/2" O.D. Tight Radius	2-1/2"



45° ELBOWS

PART #	DESCRIPTION	CLR
LR4045E	4" O.D. Long Radius – Expanded One End	10"
SR4045E	4" O.D. Short Radius – Expanded One End	6"
LR3545E	3-1/2" O.D. Long Radius – Expanded One End	9"
SR3545E	3-1/2" O.D. Short Radius – Expanded One End	5-1/4"
LR3045E	3" O.D. Long Radius – Expanded One End	6"
SR3045E	3" O.D. Short Radius – Expanded One End	4-1/2"
SR2545E	2-1/2" O.D. Long Radius – Expanded One End	10"
SR2545E	2-1/2" O.D. Short Radius – Expanded One End	5"
TR2545	2-1/2" O.D. Tight Radius	2-1/2"
LR22545	2-1/4" O.D. Long Radius	5-1/2"
SR22545	2-1/4" O.D. Short Radius	4"
TR22545	2-1/4" O.D. Tight Radius	3"
LR2045	2" O.D. Long Radius	6"
SR2045	2" O.D. Short Radius	4"
TR2045	2" O.D. Tight Radius	3"
LR18745	1-7/8" O.D. Long Radius	4-1/2"
SR18745	1-7/8" O.D. Short Radius	4"
TR18745	1-7/8" O.D. Tight Radius	3"
LR17545	1-3/4" O.D. Long Radius	4-1/2"
SR17545	1-3/4" O.D. Short Radius	3-1/2"
TR17545	1-3/4" O.D. Tight Radius	2-1/2"
LR16345	1-5/8" O.D. Long Radius	4-3/8"
SR16345	1-5/8" O.D. Short Radius	4"
TR16345	1-5/8" O.D. Tight Radius	2-1/2"
LR1545	1-1/2" O.D. Long Radius	4"
SR1545	1-1/2" O.D. Short Radius	3-1/2"
TR1545	1-1/2" O.D. Tight Radius	2-1/2"



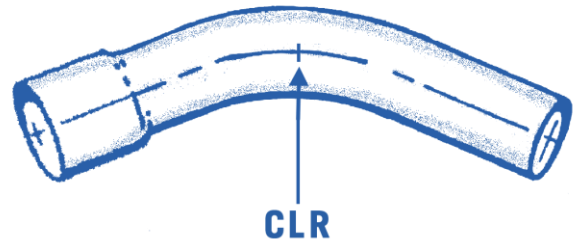
ALL ELBOWS ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA) MILD STEEL ROUND TUBE
 BENDS ON SHORT RADIUS (SR) ELBOWS WILL NEST INSIDE BENDS ON LONG RADIUS (LR) ELBOWS
 ELBOWS WITH EXPANDED ENDS MAY ALSO BE AVAILABLE WITHOUT EXPANDED ENDS (PART NO'S ENDING IN "E")
 MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 NO PART IS GUARANTEED TO BE IN STOCK



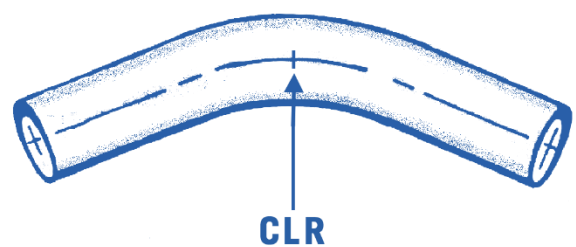
ROUND STEEL ELBOWS

<i>30° ELBOWS</i>		
PART #	DESCRIPTION	CLR
LR4030E	4" O.D. Long Radius – Expanded One End	10"
SR4030E	4" O.D. Short Radius – Expanded One End	6"
LR3530E	3-1/2" O.D. Long Radius – Expanded One End	9"
SR3530E	3-1/2" O.D. Short Radius – Expanded One End	5-1/4"
LR3030E	3" O.D. Long Radius – Expanded One End	6"
SR3030E	3" O.D. Short Radius – Expanded One End	4-1/2"
LR2530E	2-1/2" O.D. Long Radius – Expanded One End	10"
SR2530E	2-1/2" O.D. Short Radius – Expanded One End	5"
TR2530	2-1/2" O.D. Tight Radius	2-1/2"
LR22530	2-1/4" O.D. Long Radius	5-1/2"
SR22530	2-1/4" O.D. Short Radius	4"
TR22530	2-1/4" O.D. Tight Radius	3"
LR2030	2" O.D. Long Radius	6"
SR2030	2" O.D. Short Radius	4"
TR2030	2" O.D. Tight Radius	3"
LR18730	1-7/8" O.D. Long Radius	4-1/2"
SR18730	1-7/8" O.D. Short Radius	4"
TR18730	1-7/8" O.D. Tight Radius	3"
LR17530	1-3/4" O.D. Long Radius	4-1/2"
SR17530	1-3/4" O.D. Short Radius	3-1/2"
TR17530	1-3/4" O.D. Tight Radius	2-1/2"
LR16330	1-5/8" O.D. Long Radius	4-3/8"
SR16330	1-5/8" O.D. Short Radius	4"
TR16330	1-5/8" O.D. Tight Radius	2-1/2"
LR1530	1-1/2" O.D. Long Radius	4"
SR1530	1-1/2" O.D. Short Radius	3-1/2"
TR1530	1-1/2" O.D. Tight Radius	2-1/2"

**30° Elbow
Expanded One End**



30° Elbow



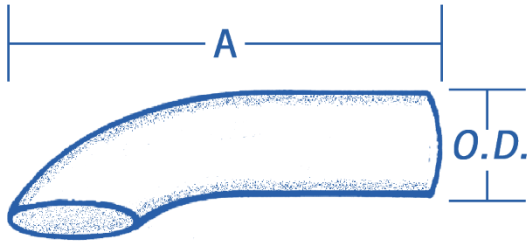
ALL ELBOWS ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA) MILD STEEL ROUND TUBE
 BENDS ON SHORT RADIUS (SR) ELBOWS WILL NEST INSIDE BENDS ON LONG RADIUS (LR) ELBOWS
 ELBOWS WITH EXPANDED ENDS MAY ALSO BE AVAILABLE WITHOUT EXPANDED ENDS (PART NO'S ENDING IN "E")
 MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 NO PART IS GUARANTEED TO BE IN STOCK



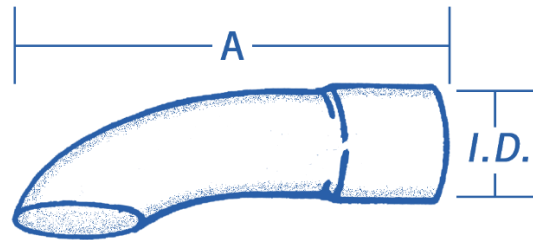
TURNOUT PIPES

<i>TURNOUT PIPES</i>			
PART #	DESCRIPTION	O.D.	A
TP4012	4" O.D. Turnout Pipe	4"	11"
TP3512	3-1/2" O.D. Turnout Pipe	3-1/2"	13"
TP3012	3" O.D. Turnout Pipe	3"	11"

<i>EXPANDED INLET TURNOUT PIPE</i>			
PART #	DESCRIPTION	I.D.	A
TP4012E	4" O.D. Turnout Pipe – Expanded Inlet	4"	11"
TP3512E	3-1/2" O.D. Turnout Pipe – Expanded Inlet	3-1/2"	13"
TP3012E	3" O.D. Turnout Pipe – Expanded Inlet	3"	11"



Turnout Pipe

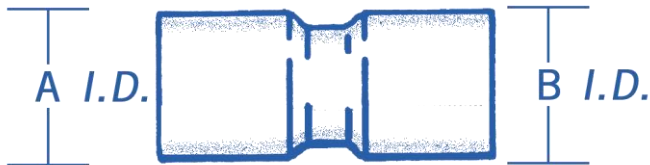


**Turnout Pipe
Expanded One End**

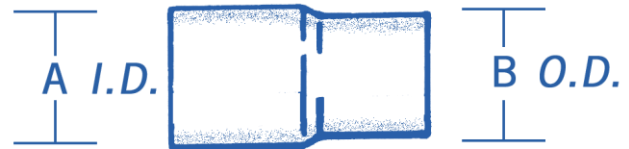
ROUND COUPLERS

<i>ROUND COUPLERS EXPANDED ONE END</i>			
PART #	DESCRIPTION	A	B
C35EE	3-1/2" O.D. Expanded Both Ends	3-1/2"	3-1/2"
C30EE	3" O.D. Expanded Both Ends	3"	3"
C25EE	2-1/2" O.D. Expanded Both Ends	2-1/2"	2-1/2"

<i>ROUND COUPLERS EXPANDED BOTH ENDS</i>			
PART #	DESCRIPTION	A	B
C35E	3-1/2" O.D. Expanded One End	3-1/2"	3-1/2"
C30E	3" O.D. Expanded One End	3"	3"
C25E	2-1/2" O.D. Expanded One End	2-1/2"	2-1/2"



**Coupler
Expanded Both Ends**



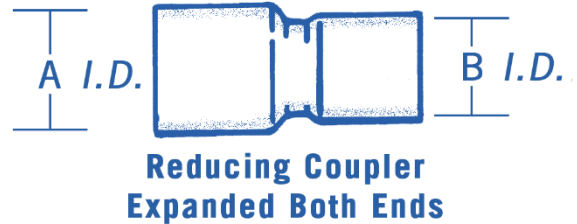
**Coupler
Expanded One End**

ALL ADAPTERS, COUPLERS AND TURNOUT PIPES ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA) MILD STEEL ROUND TUBE
MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
NO PART IS GUARANTEED TO BE IN STOCK



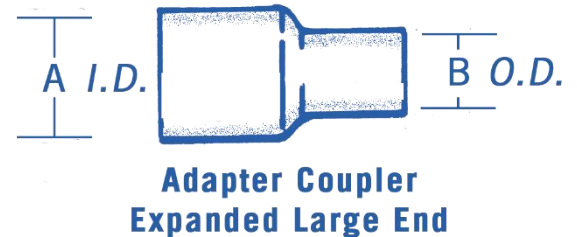
REDUCING COUPLERS

REDUCING COUPLERS			
PART #	DESCRIPTION	A	B
RC40E35E	4" Expanded End to 3-1/2" Expanded End	4"	3-1/2"
RC35E30E	3-1/2" Expanded End to 3" Expanded End	3-1/2"	3"
RC30E25E	3" Expanded End to 2-1/2" Expanded End	3"	2-1/2"
RC25E20E	2-1/2" Expanded End to 2" Expanded End	2-1/2"	2"
RC20E17E	2" Expanded End to 1-3/4" Expanded End	2"	1-3/4"

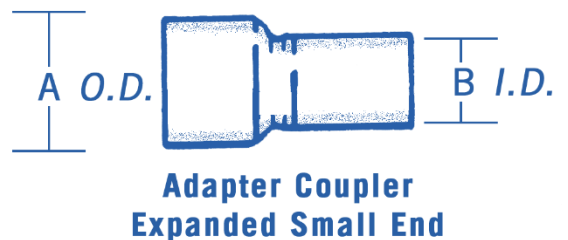


ADAPTER COUPLERS

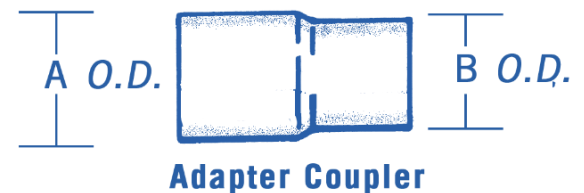
ADAPTER COUPLERS EXPANDED LARGE END			
PART #	DESCRIPTION	A	B
AC40E35	4" Expanded End to 3-1/2"	4"	3-1/2"
AC35E30	3-1/2" Expanded End to 3"	3-1/2"	3"
TA30E25	3" Expanded End to 2-1/2"	3"	2-1/2"
TA25E20	2-1/2" Expanded End to 2"	2-1/2"	2"
TA20E17	2" Expanded End to 1-3/4"	2"	1-3/4"



ADAPTER COUPLERS EXPANDED SMALL END			
PART #	DESCRIPTION	A	B
AC4035E	4" to 3-1/2" Expanded End	4"	3-1/2"
AC3530E	3-1/2" to 3" Expanded End	3-1/2"	3"
TA3025E	3" to 2-1/2" Expanded End	3"	2-1/2"
TA2520E	2-1/2" to 2" Expanded End	2-1/2"	2"
TA2017E	2" to 1-3/4" Expanded End	2"	1-3/4"



ADAPTER COUPLERS NO EXPANSIONS			
PART #	DESCRIPTION	A	B
AC4035	4" to 3-1/2"	4"	3-1/2"
AC3530	3-1/2" to 3"	3-1/2"	3"
TA3025	3" to 2-1/2"	3"	2-1/2"
TA2520	2-1/2" to 2"	2-1/2"	2"
TA2017	2" to 1-3/4"	2"	1-3/4"



ALL ADAPTERS, COUPLERS AND TURNOUT PIPES ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA) MILD STEEL ROUND TUBE
MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
NO PART IS GUARANTEED TO BE IN STOCK



STRAIGHT ROUND SECTIONS

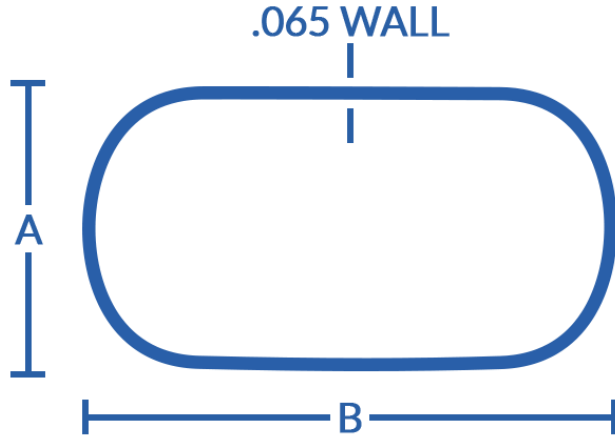
STRAIGHT ROUND SECTIONS	
PART #	DESCRIPTION
P4096	4" O.D. X 96" Long
P4060	4" O.D. X 60" Long
P4048	4" O.D. X 48" Long
P4036	4" O.D. X 36" Long
P4024	4" O.D. X 24" Long
P4012	4" O.D. X 12" Long
P3596	3-1/2" O.D. X 96" Long
P3560	3-1/2" O.D. X 60" Long
P3548	3-1/2" O.D. X 48" Long
P3536	3-1/2" O.D. X 36" Long
P3524	3-1/2" O.D. X 24" Long
P3512	3-1/2" O.D. X 12" Long
P3096	3" O.D. X 96" Long
P3060	3" O.D. X 60" Long
P3048	3" O.D. X 48" Long
P3036	3" O.D. X 36" Long
P3024	3" O.D. X 24" Long
P3012	3" O.D. X 12" Long
P2596	2-1/2" O.D. X 96" Long
P2560	2-1/2" O.D. X 60" Long
P2548	2-1/2" O.D. X 48" Long
P2536	2-1/2" O.D. X 36" Long
P2524	2-1/2" O.D. X 24" Long
P2512	2-1/2" O.D. X 12" Long

STRAIGHT ROUND SECTIONS	
PART#	DESCRIPTION
P2296	2-1/4" O.D. X 96" Long
P2260	2-1/4" O.D. X 60" Long
P2248	2-1/4" O.D. X 48" Long
P2236	2-1/4" O.D. X 36" Long
P2224	2-1/4" O.D. X 24" Long
P2212	2-1/4" O.D. X 12" Long
P2096	2" O.D. X 96" Long
P2060	2" O.D. X 60" Long
P2048	2" O.D. X 48" Long
P2036	2" O.D. X 36" Long
P2024	2" O.D. X 24" Long
P2012	2" O.D. X 12" Long
P1796	1-3/4" O.D. X 96" Long
P1760	1-3/4" O.D. X 60" Long
P1748	1-3/4" O.D. X 48" Long
P1736	1-3/4" O.D. X 36" Long
P1724	1-3/4" O.D. X 24" Long
P1712	1-3/4" O.D. X 12" Long
P1596	1-1/2" O.D." X 96" Long
P1560	1-1/2" O.D." X 60" Long
P1548	1-1/2" O.D." X 48" Long
P1536	1-1/2" O.D." X 36" Long
P1524	1-1/2" O.D." X 24" Long
P1512	1-1/2" O.D. X 12" Long

ALL STRAIGHT ROUND SECTIONS ARE FULLY WELDABLE .065" WALL (16 GA) MILD STEEL ROUND TUBES
 STRAIGHT ROUND SECTIONS MAY ALSO BE AVAILALBE WITH ONE END EXPANDED
 MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 NO PART IS GUARANTEED TO BE IN STOCK



OVAL TUBES



OVAL TUBE DIMENSIONS		
SIZE	A	B
3" OVAL	2-1/8"	3-7/16"
3-1/2" OVAL	2-1/4"	4-3/16"
4" OVAL	2-3/8"	4-7/8"

STRAIGHT OVAL SECTIONS

STRAIGHT OVAL SECTIONS	
PART #	DESCRIPTION
OP4096	4" OVAL X 96" Long
OP4060	4" OVAL X 60" Long
OP4048	4" OVAL X 48" Long
OP4036	4" OVAL X 36" Long
OP4024	4" OVAL X 24" Long
OP3596	3-1/2" OVAL X 96" Long
OP3560	3-1/2" OVAL X 60" Long
OP3548	3-1/2" OVAL X 48" Long
OP3536	3-1/2" OVAL X 36" Long
OP3524	3-1/2" OVAL X 24" Long
OP3096	3" OVAL X 96" Long
OP3060	3" OVAL X 60" Long
OP3048	3" OVAL x 48" Long
OP3036	3" OVAL X 36" Long
OP3024	3" OVAL x 24" Long

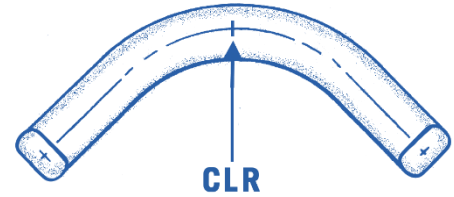
ALL OVAL TUBES ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA.) MILD STEEL TUBE
 MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 STRAIGHT OVAL SECTIONS MAY ALSO BE AVAIALBE WITH ONE END EXPANDED
 NO PART IS GUARANTEED TO BE IN STOCK



OVAL ELBOWS

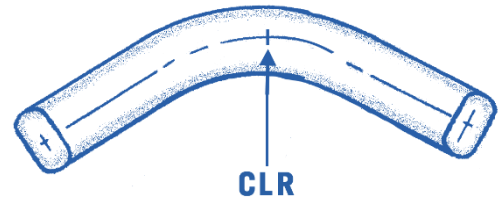
90° ELBOWS		
PART #	DESCRIPTION	CLR
OSR4090	4" OVAL Short Radius	6"
OLR3590	3-1/2" OVAL Long Radius	9"
OSR3590	3-1/2" OVAL Short Radius	5-1/4"
OLR3090	3" OVAL Long Radius	6"
OSR3090	3" OVAL Short Radius	4-1/2"

90° Oval Elbow



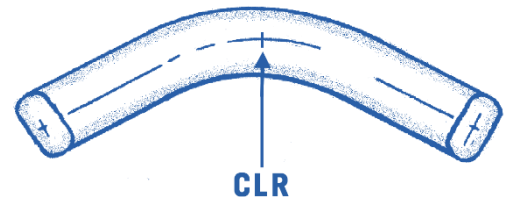
60° ELBOWS		
PART #	DESCRIPTION	CLR
OSR4060	4" OVAL Short Radius	6"
OLR3560	3-1/2" OVAL Long Radius	9"
OSR3560	3-1/2" OVAL Short Radius	5-1/4"
OP3536LR60	3-1/2" OVAL Long Radius - 24" OVAL Long Leg	9"
OP3536SR60	3-1/2" OVAL Short Radius - 24" OVAL Long Leg	5-1/4"
OLR3060	3" OVAL Long Radius	6"
OSR3060	3" OVAL Short Radius	4-1/2"
OP3036SR60	3" OVAL Long Radius - 24" OVAL Long Leg	6"
OP3036LR60	3" OVAL Short Radius - 24" OVAL Long Leg	4-1/2"

60° Oval Elbow



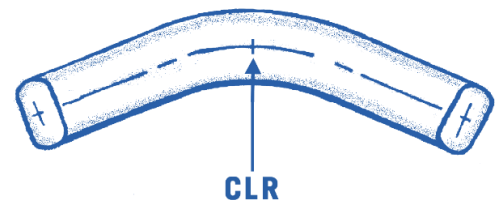
45° ELBOWS		
PART #	DESCRIPTION	CLR
OSR4045	4" OVAL Short Radius	6"
OLR3545	3-1/2" OVAL Long Radius	9"
OSR3545	3-1/2" OVAL Short Radius	5-1/4"
OLR3045	3" OVAL Long Radius	6"
OSR3045	3" OVAL Short Radius	4-1/2"

45° Oval Elbow



30° ELBOWS		
PART #	DESCRIPTION	CLR
OSR4030	4" OVAL Short Radius	6"
OLR3530	3-1/2" OVAL Long Radius	9"
OSR3530	3-1/2" OVAL Short Radius	5-1/4"
OLR3030	3" OVAL Long Radius	6"
OSR3030	3" OVAL Short Radius	4-1/2"

30° Oval Elbow



ALL OVAL ELBOWS ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA.) MILD STEEL TUBE
 BENDS ON SHORT RADIUS (SR) ELBOWS WILL NEST INSIDE BENDS ON LONG RADIUS (LR) ELBOWS
 MAY ALSO BE AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 NO PART IS GUARANTEED TO BE IN STOCK



3" OVAL E-BENDS

180° E-BEND

PART #	DESCRIPTION	CLR
OSRE30180	3" OVAL Short Radius E-Bend	5"

135° E-BEND

PART #	DESCRIPTION	CLR
OSRE30135	3" OVAL Short Radius E-Bend	5"

90° E-BEND

PART #	DESCRIPTION	CLR
OSRE3090	3" OVAL Short Radius E-Bend	5"

60° E-BEND

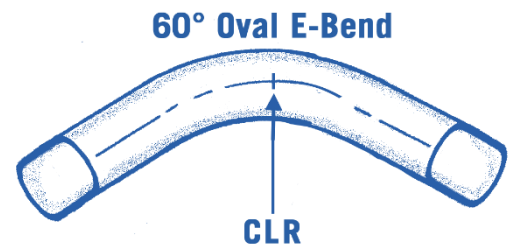
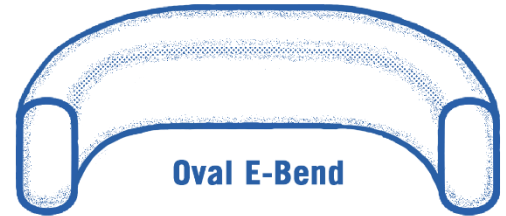
PART #	DESCRIPTION	CLR
OSRE3060	3" OVAL Short Radius E-Bend	5"

45° E-BEND

PART #	DESCRIPTION	CLR
OSRE3060	3" OVAL Short Radius E-Bend	5"

30° E-BEND

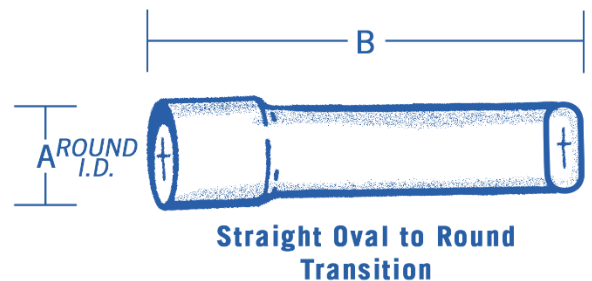
PART #	DESCRIPTION	CLR
OSRE3030	3" OVAL Short Radius E-Bend	5"



OVAL TRANSITIONS

STRAIGHT OVAL TO ROUND TRANSITIONS

PART #	DESCRIPTION	A	B
OTP4036E	4" OVAL to Round Exp. Transition x 36" Long	4"	36"
OTP4024E	4" OVAL to Round Exp. Transition x 24" Long	4"	24"
OTP4012E	4" OVAL to Round Exp. Transition x 12" Long	4"	12"
OTP3536E	3-1/2" OVAL to Round Exp. Transition x 36" Long	3-1/2"	36"
OTP3524E	3-1/2" OVAL to Round Exp. Transition x 24" Long	3-1/2"	24"
OTP3512E	3-1/2" OVAL to Round Exp. Transition x 12" Long	3-1/2"	12"
OTP3036E	3" OVAL to Round Exp. Transition x 36" Long	3"	36"
OTP3024E	3" OVAL to Round Exp. Transition x 24" Long	3"	24"
OTP3012E	3" OVAL to Round Exp. Transition x 12" Long	3"	12"

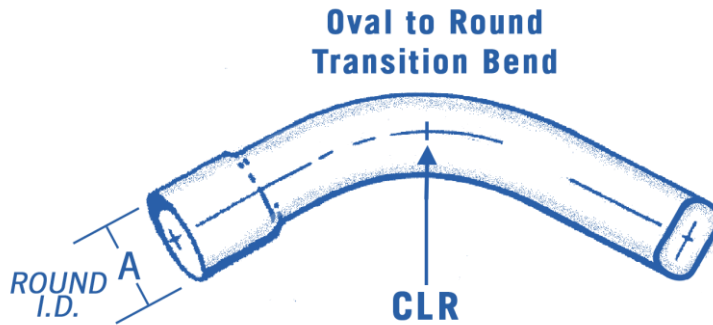


ALL OVAL TRANSITIONS AND ADAPTERS ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA.) MILD STEEL TUBE
 MAY ALSO AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
 NO PART IS GUARANTEED TO BE IN STOCK



OVAL TRANSITIONS

<i>OVAL TO ROUND TRANSITION BENDS</i>			
PART #	DESCRIPTION	CLR	A
OSR3590-35E	3-1/2" OVAL Short Radius 90° Bend - Round leg expanded	5-1/4"	3-1/2"
OSR3560-35E	3-1/2" OVAL Short Radius 60° Bend - Round leg expanded	5-1/4"	3-1/2"
OSR3545-35E	3-1/2" OVAL Short Radius 45° Bend - Round leg expanded	5-1/4"	3-1/2"
OSR3530-35E	3-1/2" OVAL Short Radius 30° Bend - Round leg expanded	5-1/4"	3-1/2"



OVAL ADAPTERS

<i>OVAL ADAPTER</i>			
PART #	DESCRIPTION	A	B
OP35E	3-1/2" Oval Expanded One End	3-1/2"	3-1/2"

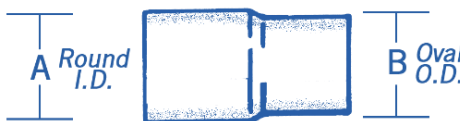


**Oval Adapter
Expanded One End**

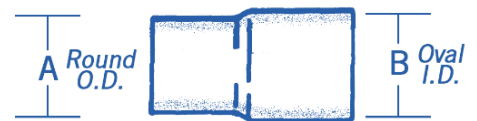
<i>ROUND TO OVAL ADAPTER</i>			
PART #	DESCRIPTION	A	B
ROA25E30	2-1/2" Round Expanded to 3" Oval	2-1/2"	3"
ROA2530E	2-1/2" Round to 3" Oval Expanded	2-1/2"	3"
ROA25E30E	2-1/2" Round Expanded to 3" Oval Expanded	2-1/2"	3"
ROA30E35	3" Round Expanded To 3-1/2" Oval	3	3-1/2"
ROA35E40	3-1/2" Round Expanded To 4" Oval	3-1/2"	4"
ROA25E30	2-1/2" Round Expanded to 3" Oval	2-1/2"	3"



**Round to Oval Adapter
Expanded Both Ends**



**Round to Oval Adapter
Round End Expanded**



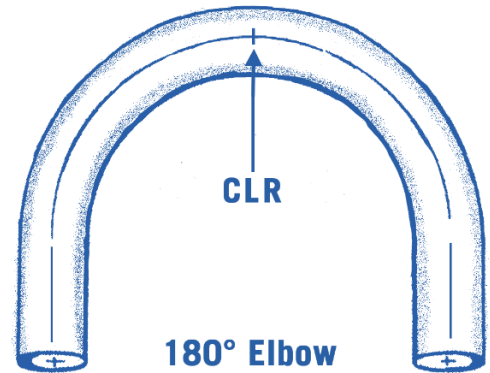
**Round to Oval Adapter
Oval End Expanded**

ALL OVAL TRANSITIONS AND ADAPTERS ARE MANUFACTURED FROM FULLY WELDABLE .065" WALL (16 GA.) MILD STEEL TUBE
MAY ALSO AVAILABLE IN .065" WALL (16 GA.) STAINLESS STEEL OR ALUMINIZED STEEL
NO PART IS GUARANTEED TO BE IN STOCK

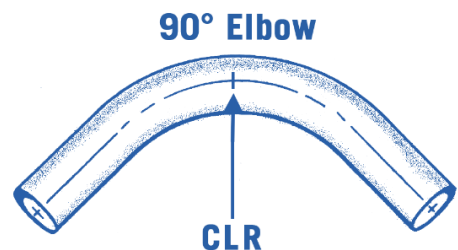


ALUMINUM ELBOWS

<i>180° ELBOWS</i>		
PART #	DESCRIPTION	CLR
ALR30180	3" Long Radius	6"
ASR30180	3" Short Radius	4-1/2"
ALR25180	2-1/2" Long Radius	10"
ASR25180	2-1/2" Short Radius	5"
ALR225180	2-1/4" Long Radius	7"
ASR225180	2-1/4" Short Radius	4"
ALR20180	2" Long Radius	6"
ASR20180	2" Short Radius	4"
ALR17180	1-3/4" Long Radius	3-1/2"
ASR17180	1-3/4" Short Radius	2-1/2"
ASR16180	1-5/8" Long Radius	4-3/8"
ALR16180	1-5/8" Short Radius	4"
ALR15180	1-1/2" Long Radius	4"
ASR15180	1-1/2" Short Radius	3-1/2"
ALR13180	1-3/8" Long Radius	4-1/8"
ASR13180	1-3/8" Short Radius	2-1/2"
ALR12180	1-1/4" Long Radius	3-1/2"
ASR12180	1-1/4" Short Radius	2-1/2"
ALR10180	1" Long Radius	2-1/2"
ASR10180	1" Short Radius	1-1/2"
ALR75180	3/4" Long Radius	1-7/8"
ASR75180	3/4" Short Radius	1"



<i>90° ELBOWS</i>		
PART #	DESCRIPTION	CLR
ALR3090	3" Long Radius	6"
ASR3090	3" Short Radius	4-1/2"
ALR2590	2-1/2" Long Radius	10"
ASR2590	2-1/2" Short Radius	5"
ALR22590	2-1/4" Long Radius	7"
ASR22590	2-1/4" Short Radius	4"
ALR2090	2" Long Radius	6"
ASR2090	2" Short Radius	4"
ALR1790	1-3/4" Long Radius	3-1/2"
ASR1790	1-3/4" Short Radius	2-1/2"
ASR1690	1-5/8" Long Radius	4-3/8"
ALR1690	1-5/8" Short Radius	4"
ALR1590	1-1/2" Long Radius	4"
ASR1590	1-1/2" Short Radius	3-1/2"
ALR1390	1-3/8" Long Radius	4-1/8"
ASR1390	1-3/8" Short Radius	2-1/2"



ALL ALUMINUM ELBOWS ARE MANUFACTURED FROM .065" WALL (16 GA.) 6061-T6

BEADED ENDS MAY ALSO BE AVAILABLE

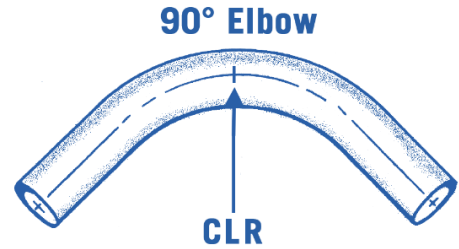
NO PART IS GUARANTEED TO BE IN STOCK



ALUMINUM ELBOWS

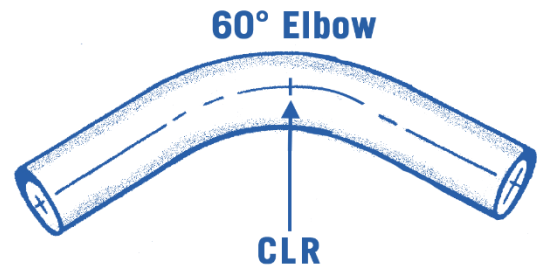
90° ELBOWS cont.

PART #	DESCRIPTION	CLR
ALR1290	1-1/4" Long Radius	3-1/2"
ASR1290	1-1/4" Short Radius	2-1/2"
ALR1090	1" Long Radius	2-1/2"
ASR1090	1" Short Radius	1-1/2"
ALR7590	3/4" Long Radius	1-7/8"
ASR7590	3/4" Short Radius	1"



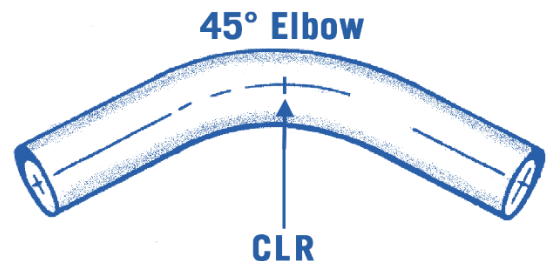
60° ELBOWS

PART #	DESCRIPTION	CLR
ALR3060	3" Long Radius	6"
ASR3060	3" Short Radius	4-1/2"
ALR2560	2-1/2" Long Radius	10"
ASR2560	2-1/2" Short Radius	5"
ALR22560	2-1/4" Long Radius	7"
ASR22560	2-1/4" Short Radius	4"
ALR2060	2" Long Radius	6"
ASR2060	2" Short Radius	4"
ALR1760	1-3/4" Long Radius	3-1/2"
ASR1760	1-3/4" Short Radius	2-1/2"
ASR1645	1-5/8" Long Radius	4-3/8"
ALR1645	1-5/8" Short Radius	4"
ALR1560	1-1/2" Long Radius	4"
ASR1560	1-1/2" Short Radius	3-1/2"
ALR1360	1-3/8" Long Radius	4-1/8"
ASR1360	1-3/8" Short Radius	2-1/2"
ALR1260	1-1/4" Long Radius	3-1/2"
ASR1260	1-1/4" Short Radius	2-1/2"
ALR1060	1" Long Radius	2-1/2"
ASR1060	1" Short Radius	1-1/2"
ALR7560	3/4" Long Radius	1-7/8"
ASR7560	3/4" Short Radius	1"



45° ELBOWS

PART #	DESCRIPTION	CLR
ALR3045	3" Long Radius	6"
ASR3045	3" Short Radius	4-1/2"
ALR2545	2-1/2" Long Radius	10"
ASR2545	2-1/2" Short Radius	5"
ALR22545	2-1/4" Long Radius	7"
ASR22545	2-1/4" Short Radius	4"



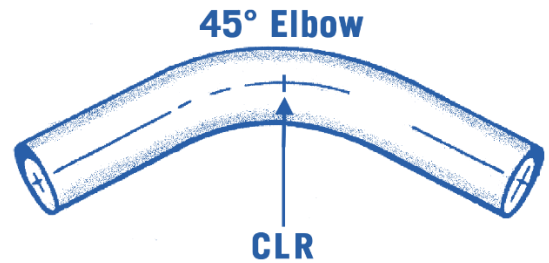
ALL ALUMINUM ELBOWS ARE MANUFACTURED FROM .065" WALL (16 GA.) 6061-T6
 BEADED ENDS MAY ALSO BE AVAILABLE
 NO PART IS GUARANTEED TO BE IN STOCK



ALUMINUM ELBOWS

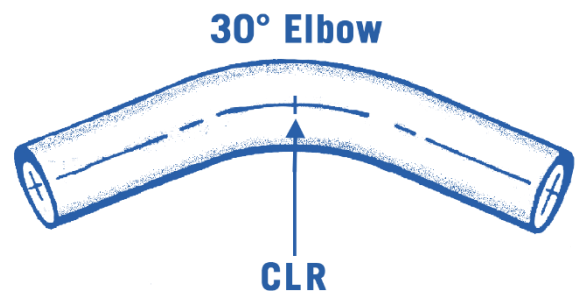
45° ELBOWS cont.

PART #	DESCRIPTION	CLR
ALR2045	2" Long Radius	6"
ASR2045	2" Short Radius	4"
ALR1745	1-3/4" Long Radius	3-1/2"
ASR1745	1-3/4" Short Radius	2-1/2"
ASR1645	1-5/8" Long Radius	4-3/8"
ALR1645	1-5/8" Short Radius	4"
ALR1545	1-1/2" Long Radius	4"
ASR1545	1-1/2" Short Radius	3-1/2"
ALR1345	1-3/8" Long Radius	4-1/8"
ASR1345	1-3/8" Short Radius	2-1/2"
ALR1245	1-1/4" Long Radius	3-1/2"
ASR1245	1-1/4" Short Radius	2-1/2"
ALR1045	1" Long Radius	2-1/2"
ASR1045	1" Short Radius	1-1/2"
ALR7545	3/4" Long Radius	1-7/8"
ASR7545	3/4" Short Radius	1"



30° ELBOWS

PART #	DESCRIPTION	CLR
ALR3030	3" Long Radius	6"
ASR3030	3" Short Radius	4-1/2"
ALR2530	2-1/2" Long Radius	10"
ASR2530	2-1/2" Short Radius	5"
ALR22530	2-1/4" Long Radius	7"
ASR22530	2-1/4" Short Radius	4"
ALR2030	2" Long Radius	6"
ASR2030	2" Short Radius	4"
ALR1730	1-3/4" Long Radius	3-1/2"
ASR1730	1-3/4" Short Radius	2-1/2"
ASR1630	1-5/8" Long Radius	4-3/8"
ALR1630	1-5/8" Short Radius	4"
ALR1530	1-1/2" Long Radius	4"
ASR1530	1-1/2" Short Radius	3-1/2"
ALR1330	1-3/8" Long Radius	4-1/8"
ASR1330	1-3/8" Short Radius	2-1/2"
ALR1230	1-1/4" Long Radius	3-1/2"
ASR1230	1-1/4" Short Radius	2-1/2"
ALR1030	1" Long Radius	2-1/2"
ASR1030	1" Short Radius	1-1/2"
ALR7530	3/4" Long Radius	1-7/8"
ASR7530	3/4" Short Radius	1"



ALL ALUMINUM ELBOWS ARE MANUFACTURED FROM .065" WALL (16 GA.) 6061-T6

BEADED ENDS MAY ALSO BE AVAILABLE

NO PART IS GUARANTEED TO BE IN STOCK

CUSTOM AND CONTRACT TUBE BENDING

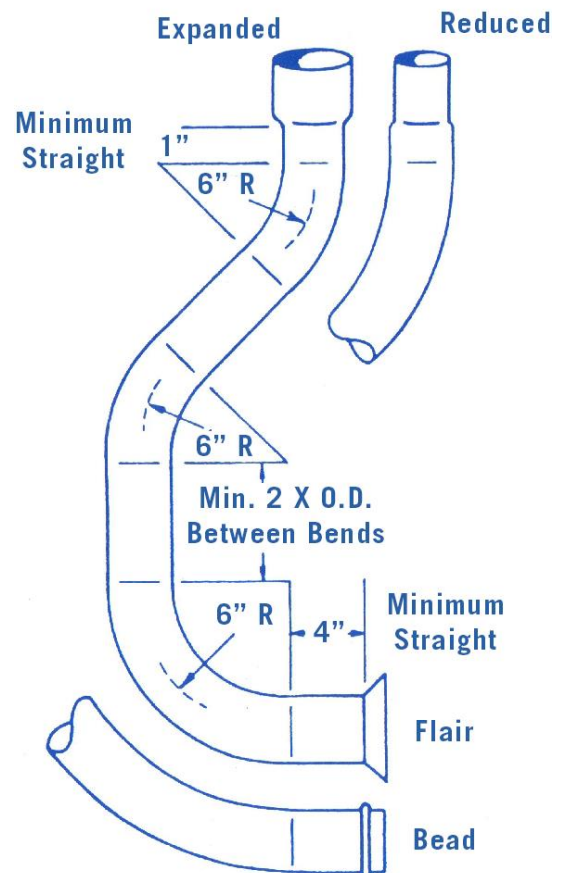
Boyce Industries created specialized set-up programs for the various tube bending protocols many years ago. These are designed to meet or exceed your requirements. Producing high quality components is just an email or phone call away.

Boyce is equipped to handle jobs from prototype through production and can supply both simple bends and completely formed and welded assemblies.

Our Production Shop inventories over 1,000 different bend-die combinations and has capacity to mandrel bend Aluminum, Brass, Mild Steel, Alloy Steel, and Stainless Steel Tubes. Our capabilities range from ½" to 5" O.D. Round Tubes and 1" to 4" Square and Rectangular Tubes in a variety of wall thicknesses. To supplement this, our Secondary Operations Department offers Miter Cutting, Expanding and Reducing, Notching, Drilling and Custom Welding.

DESIGN PROCEDURE FOR BENT TUBULAR PRODUCTS

1. Use bend radii of 1-1/2 x O.D. of tube or greater when design permits. Use existing tooling if possible, to avoid unnecessary die costs. (EX: 1.50 times 2" O.D. = 3" bend radius.)
2. When possible, try to avoid bends that are too close together or "bends within bends". These designs require special tooling and will greatly increase piece part cost.
3. When possible, try to use the same bend radius on tube being designed to minimize production costs. Allow minimum of 2 x tube O.D. between bends for clamping. Check with Boyce for clamp length information.
4. Avoid expanded and flared ends too close to bend tangent(s). Allow 1" minimum on expanded or reduced ends and 4" minimum for flare, bead or end finishing.
5. Bend radii smaller than 1-1/2 x tube O.D. will result in specialized tooling and material. Always use largest radius possible when designing bent parts to avoid premium bends.



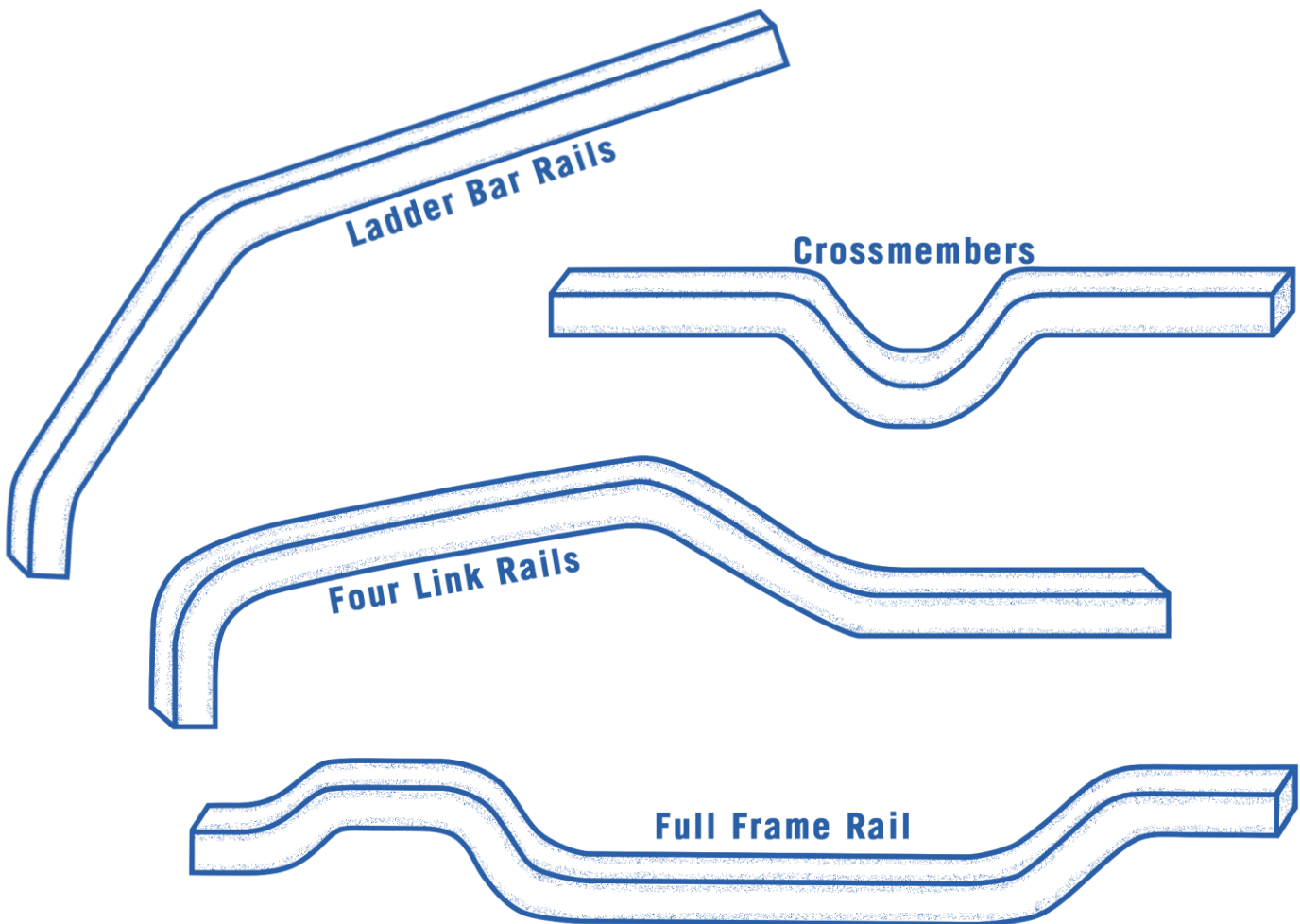


CUSTOM & UNIVERSAL FRAME RAILS & CROSSMEMBERS

Boyce Industries specializes in the production of custom and universal frame rails and cross members. Manufactured on Pines #4 Mandrel Benders designed specifically for bending rectangle tubes the “hard way” (H-Plane) and the “easy way” (E-Plane). We have dozens of bend-die combinations to offer a variety of inside radius bends to suit your custom needs.

We use only high-quality 2 x 3 x .083 and 2 x 3 x .120 Hot Rolled, Pickled and Oiled mild steel tube from large mill runs. This ensures consistency in surface finish, wall thickness and mechanical properties of the tube.

Full lengths of tubes available from A.E.D Metal Products and Supplies. aedmetals.com





Round Tube Die Sets

TUBE O.D.	CENTERLINE RADIUS										
1/2"	1-1/2"										
9/16"	2"										
5/8"	1-1/4"	1-3/4"	1-7/8"	2-1/2"							
11/16"	1-1/4"										
3/4"	1-1/4"	1-1/2"	1-3/4"	1-7/8"	2"	2-1/4"	3"				
7/8"	1-5/16"	1-1/2"	1-3/4"	1-5/16"	1-1/2"	1-3/4"	1-15/16"	2-1/4"	2-1/2"	3-7/16"	4"
1"	1-1/2"	1-3/4"	2"	2-1/2"	2-5/16"	2-9/16"	3"	4-1/2"	6"		
1-1/16"	1-1/2"	2"									
1-1/8"	1-5/8"	1-3/4"	2"	2-1/2"	3"	3-3/8"	4"	5"			
1-1/4"	2"	2-1/2"	3"	3-1/2"							
1-5/16"	2-1/4"	2-1/2"	4"								
1-3/8"	2-1/16"	2-1/2"	3"	4-1/8"							
1-1/2"	2-1/2"	2-3/4"	3"	4"	5"						
1-5/8"	2-1/2"	4"	4-3/8"								
1-3/4"	2"	2-1/2"	3-1/2"	4"	4-1/2"	6"	7-7/8"				
1-7/8"	3"	4"	4-1/2"	8"							
2"	3"	4"	5"	6"							
2-1/8"	3-3/16"	4-5/16"	6-3/8"								
2-1/4"	3"	4"	5-1/2"	7"							
2-3/8"	4-7/8"	8-3/16"	9-1/4"								
2-1/2"	2-1/2"	4"	5"	10"							
2-7/8"	6"										
3"	4-1/2"	6"	9"	15"	23"	27"					
3-1/4"	5"										
3-1/2"	5-1/4"	7"	8"	9"							
4"	5"	6"	8"	10"	12"						
4-1/2"	7-3/4"	15"	33"								
5"	8"										



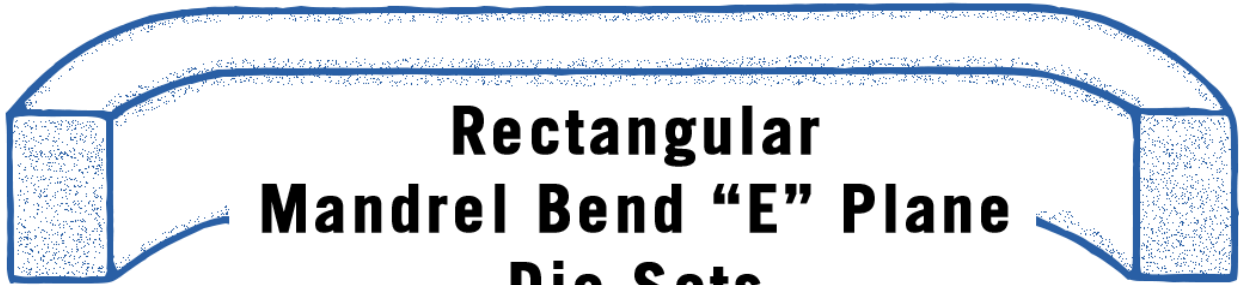
Square Tube Die Sets

TUBE SIZE	INSIDE RADIUS								
3/4" X 3/4"	2"	3-1/4"	4"						
1" X 1"	1-1/2"	3-1/4"	4"	6"	8"				
1-1/4" X 1-1/4"	3-1/4"	4"	6"	8"	12"				
1-1/2" X 1-1/2"	3-1/4"	4"	4-3/4"	6"	8"	8-5/8"	12"	15-1/4"	
1-3/4" X 1-3/4"	4"	4-3/4"	6"	8"	12"	20"	26"	30"	
2" X 2"	3-1/4"	4"	4-3/4"	6"	8"	12"	20"	26"	30"
2-1/2" X 2-1/2"	4-3/4"	6"	8"	12"	20"				
3" X 3"	6"	8"	10"	12"	20"				
4" X 4"	8"	12"	20"						



Rectangular Mandrel Bend "H" Plane Die Sets

TUBE SIZE	INSIDE RADIUS							
3/4" X 1-1/2"	3-1/4"							
1" X 1-1/2"	3-1/4"	4"	4-3/4"	6"	8"			
1" X 2"	3-1/4"	4"	4-3/4"	6"	8"	12"		
1-1/2" X 2"	4"	4-3/4"	6"	8"				
1-1/2" X 2-1/2"	4-3/4"	6"	8"	8-5/8"				
2" X 3"	4-3/4"	6"	8"	9"	10"	12"	20"	
2" X 4"	8"	9"	10"	12"	20"			
3" X 4"	12"	20"						



Rectangular Mandrel Bend "E" Plane Die Sets

TUBE SIZE	INSIDE RADIUS							
	3-1/4"	4"	4-3/4"	6"	8"			
1" X 1-1/2"	3-1/4"	4"	4-3/4"	6"	8"			
1" X 2"	3-1/4"	4"	4-3/4"	6"	8"	12"	20"	26"
1-1/2" X 2"	3-1/4"	4"	4-3/4"	6"	8"	12"	20"	26"
1-1/2" X 2-1/2"	4-3/4"	6"	8"	12"	20"			
2" X 3"	4"	4-3/4"	6"	8"	9"	10"	12"	20"
2" X 4"	4-3/4"	6"	8"	10"	12"	20"		
3" X 4"	4-3/4"	6"	8"	12"	20"			

GENERAL INFORMATION

Hours of Operation

Mon. – Fri. 8 am to 5 pm EST

Phone: 708-345-0455

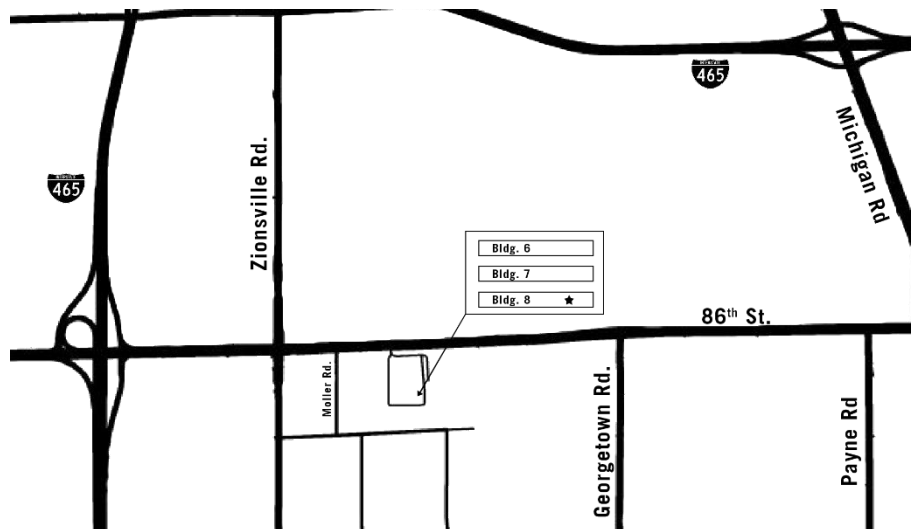
Fax: 708-345-0476

Email: Sales@boyceindustries.com

www.boyceindustries.com

5377 W. 86th St

Indianapolis, IN 46268



BUSINESS POLICIES

Warranty Disclaimer

Boyce Industries warrants its products to be free of defects in material and workmanship (which substantially affect product performance) for 90 days from the date of purchase. During this period, Boyce will at its option, repair or replace any part or parts which prove to be defective if returned to Boyce, freight prepaid, and this shall be the sole remedy available under this warranty. No claims will be allowed for labor, transportation or other incidental costs.

This warranty shall not apply if

- (1) The product is not used to perform the service for which it was intended.
- (2) The product is altered, modified or converted without the written approval of Boyce.
- (3) The product is damaged or rendered unserviceable by negligence, malfunction or by any cause within the control of the customer.

Return Policy

All returns of Boyce products are subject to management approval. A return material authorization (RMA) number is required in advance, and a 25% restock fee will be assessed on non-custom products.

Pricing

Pricing is intentionally omitted from this catalog to assure our customers the best pricing available. Due to various market changes, prices of materials may fluctuate from time to time. We re-quote at the time of order. \$25.00 minimum order.

Payment Arrangements

Boyce accepts several payment options. Orders may be charged to: VISA, MASTERCARD, AMERICAN EXPRESS AND DISCOVER. Please provide card name, account number, expiration date, security codes, cardholder's name, address and daytime telephone number.

Product Availability

No part in this catalog is guaranteed to be in stock. This is a full listing of our products and capabilities. In-stock products are determined by material availability and market conditions.

Nondisclosure Statement

Due to the nature of our customers and the confidential needs of their businesses, each and every Boyce employee must agree to and sign a Nondisclosure Agreement. This is to assure our customers that their drawings, prints, ideas, needs, and future plans are secure. All customer relations are regarded as strictly confidential.

SHIPPING

UPS

Small orders under 100 lbs., of appropriate size, will be shipped via UPS Ground. Faster UPS package delivery services are available upon request. A handling and packaging fee will be added to UPS orders, in addition to the shipping charge. UPS C.O.D. is also available at an additional cost.

UPS orders placed on in-stock items will ship within 1 business day. UPS chart rates are based on package dimensions, packed weight and shipping zones.

LTL (Less Than Truckload)

Orders over 100 lbs., or those of large package size will be shipped via common carrier “freight collect.” Additional prepaid and added freight charges may apply. A skid or packaging charge will be added for all common carrier shipments.

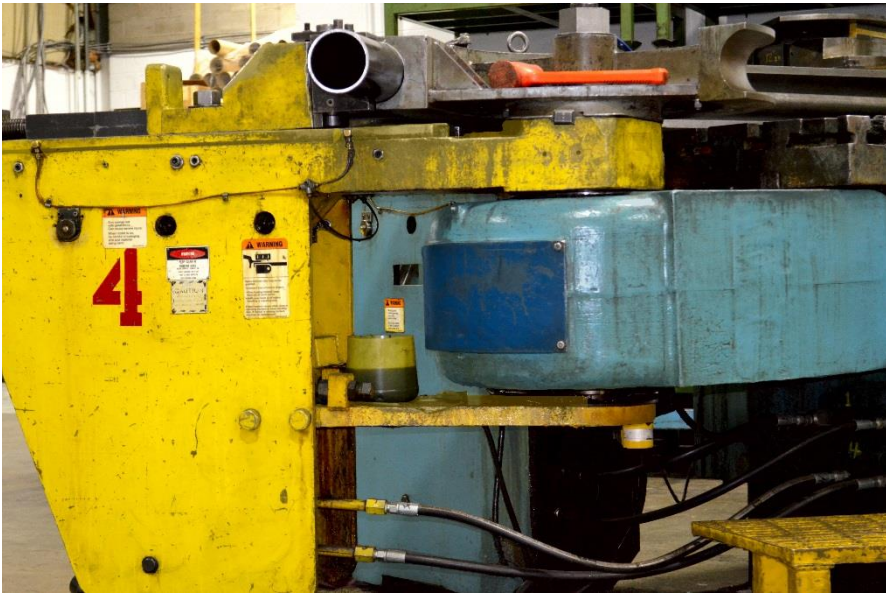
Large orders placed on in-stock items will ship within 1 business day. Common carrier rates based on package weight, dimensions and shipping zones. Boyce has obtained special LTL rates with several carriers that are passed on to our customers that do not have a negotiated shipping discount.

You are also welcome to arrange your own LTL shipment. Please contact your Boyce representative for NMFC and Class number

Special Packaging

We also offer special custom packaging services including part identification and protecting critical surface finish parts. Contact a member Boyce knowledgeable sales staff to learn more.

**Thank you for choosing
Boyce Industries!**



Boyce Industries
5377 W. 86th St, Indianapolis, IN, 46268