

FORMATHANE®



IEM



FORMATHANE®

SERVICE WE DELIVER AND QUALITY YOU CAN DEPEND ON

IEM is a leading manufacturer of die and die component products supplied globally to the parts forming industry. Backed by years of tool and die experience, quality and innovation are some of the reasons why our name is respected throughout the world. We have taken the lead role in creating and bringing new products to customers and helping them find solutions that improve their operations. Based on the capabilities **IEM** offers, we can help you to meet the demands of quick deliveries, technical support, quality products and competitive prices. **IEM** and its' broad distribution channels and direct sales personnel will assist you in any way to make your product a better and more profitable one.

Whether standard or customized products, with our years of experience, customers can be sure the products they receive will meet their expectations for reliability and dependable performance. We understand the demanding schedules of die builders and production personnel and have developed efficient manufacturing processes to shorten product lead times as well as put inventory on our shelves so you can have it in your facility when you need it. Put the **IEM** network to work for you. We've got the service you've been looking for.

Included in our full line offering are both inch and metric size die sets and die components that are designed to numerous die standards including ISO, NAAMS, JIS and many large automotive and appliance manufacturers' standards. The complete product offering includes:

- Accu-Bend Rotary Benders
- Air Presses
- Cams
 - Aerial & Diemount Cams
 - Box Cams
 - Roller Cams
 - Wide Cams
- Die Accessories
- Die Sets
 - Plain & Ball Bearing Sets
 - Catalog Ball Bearing Sets
 - Wear Plate Sets
 - Cast Sets
- Ejector Boxes
- Guide Posts & Bushings
 - Plain & Ball Bearing Styles
 - Steel, Bronze, Bronze-Plated &
 - Self-Lubricating Bushings
 - Lempoloy Bushings
 - Special Pins, Bushings & Retainers
- Hydraulics
 - Electronic Die Setters
 - Die Separators
 - Drill & Tap Equipment
 - Hydraulic Motors
- In-Die Tapping Units
- Machined and Cut Ground Plate
 - Adapter Plates
 - Bolster Plates
 - 1020, 1045 & 4140 materials
- Manufacturing Services
 - CNC Machining
 - Blanchard Grinding
 - Stress Relieving
 - Die Set Repair
- Mold Components
 - Bronze Plated & Self-Lubricated Bushings
 - Leader Pins
 - Bronze & Bronze Plated Wear Strips & Ways
- Punches, Buttons & Retainers
- Reliance Fabrications
 - Custom Fabrications
 - Robotic Welding
 - Aluminum & Steel Fixture Bases
- Springs
 - DieMax L Inch Series Springs
 - DieMax XL Series ISO Springs
 - JIS Series Springs
 - Custom Heavy Duty Springs
 - Marsh Mellow Springs
 - Formathane Urethane
 - Kaller Gas Springs
 - Utility & Disc Springs
- Wear Products
 - Plates, Strips, Gibs & Blocks
 - Steel, bronze, Bronze-Plated and Self-Lubricating Materials



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General Information



We are proud to offer the latest achievement in urethane engineering: FORMATHANE - a special family of superior urethane compounds formulated to withstand the rigors of the metalforming and fabricating operating environment.

They are cast in industry-familiar shapes and sizes, and are available in the most popular durometers (hardnesses).

FORMATHANE products are manufactured by C.U.E., Inc., USA. C.U.E., Inc. is ISO 9001 certified and one of the world leaders in cast urethanes with over 40 years of experience.

C.U.E., Inc. is proud to offer its FORMATHANE products to the Metal Stamping and Metal Fabricating industries exclusively through us.



What is FORMATHANE?

FORMATHANE is a high-quality line of advanced urethane compounds and products, chemically engineered for the metalforming and fabricating industry.

What makes FORMATHANE more than just another urethane?

First, the knowledge and experience that we have gained through our business life has been directed into FORMATHANE. Next, FORMATHANE starts with the finest raw materials, then processes them using state-of-the-art casting equipment to produce urethane compounds with consistent physical and dynamic properties.

The result

FORMATHANE compounds offer the ultimate in tensile strength, abrasion and tear resistance, load-bearing capabilities, and compression-set properties.

■ **DIE COVER FILM** ■ **SHEETS** ■ **BARS** ■
■ **RODS** ■ **STRIPPERS** ■ **SPRINGS** ■

Custom Molding

When you need a specialized FORMATHANE part, contact us.

Availability

- Many options – to cover all applications.
- Quick delivery – most are stocked for shipment in one or two days.

FORMATHANE® is a trademark of C.U.E., Inc.

Physical Properties

Property	ASTM Test Method	Compound			
		PO-670	PO-650	CU-290	PO-652
Color		Black	Red	Yellow	Tan
Hardness Shore A	D 2240	70	85	90	95
Ultimate Tensile Strength	D 412	5000 psi	6000 psi	6500 psi	5800 psi
Elongation at Break	D 412	550%	600%	475%	525%
100% Modulus	D 412	450 psi	750 psi	1100 psi	1450 psi
300% Modulus	D 412	900 psi	1700 psi	2200 psi	2500 psi
Tear Strength, Split	D 470	55 lb/in.	120 lb/in.	110 lb/in.	150 lb/in.
Tear Strength, Die C	D 624	325 lb/in.	500lb/in.	500 lb/in.	600lb/in.
Compression Modulus, 5%	D 575	50 psi	130 psi	150 psi	180 psi
Compression Modulus, 10%	D 575	110 psi	280 psi	350 psi	450 psi
Compression Modulus, 15%	D 575	170 psi	400 psi	475 psi	660 psi
Compression Modulus, 20%	D 575	250 psi	530 psi	700 psi	920 psi
Compression Modulus, 25%	D 575	340 psi	750 psi	1000 psi	1330 psi
Specific Gravity at 75° F	D 792	1.244	1.248	1.251	1.259
Resilience (rebound)	D 2632	26.2%	42.6%	39.4%	45.4%
NBS Abrasion Index	D 1630	205	250	140	385

Physical property data is based on standard laboratory tests and conditions and, therefore, does not necessarily duplicate real-world conditions. Data are not intended to and do not create any warranties, either expressed or implied. Potential users should perform independent testing to determine the suitability of materials for their intended application.

FORMATHANE Compounds ± 5 A Tolerance

PO-670 BLACK

- ◆ 70 A Durometer (soft)
- ◆ 35% recommended deflection
- ◆ A very low load-bearing capacity compound with a high tensile strength
- ◆ A popular material for low-impact applications

PO-650 RED

- ◆ 85 A Durometer (medium hard)
- ◆ 30% recommended deflection
- ◆ A medium load-bearing capacity compound suitable for light-gauge metals
- ◆ High abrasion and wear characteristics ideal for forming pads and wear pads

CU-290 YELLOW

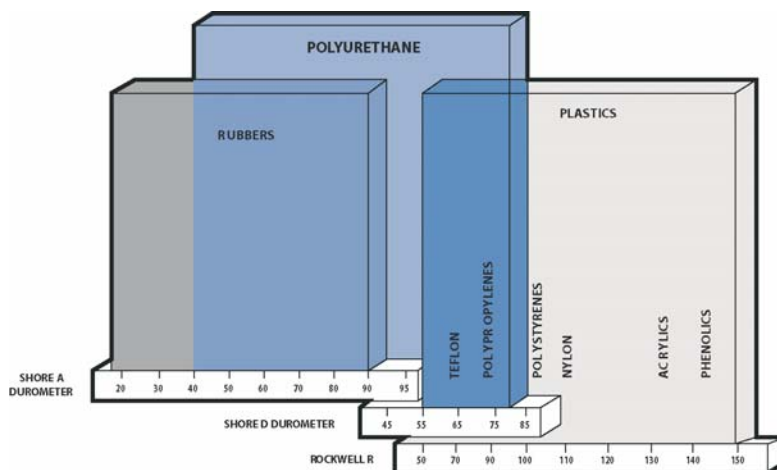
- ◆ 90 A Durometer (hard)
- ◆ 25% recommended deflection
- ◆ A high load-bearing capacity compound with a medium tear strength and cut resistance
- ◆ Recommended for medium-gauge metals

PO-652 TAN

- ◆ 95 A Durometer (very hard)
- ◆ 15% recommended deflection
- ◆ A very high load-bearing capacity compound with high tear strength and cut resistance
- ◆ Ideal for springs, strippers and all general metalforming operations

Hardness Scales

DUROMETER COMPARISONS OF MATERIALS



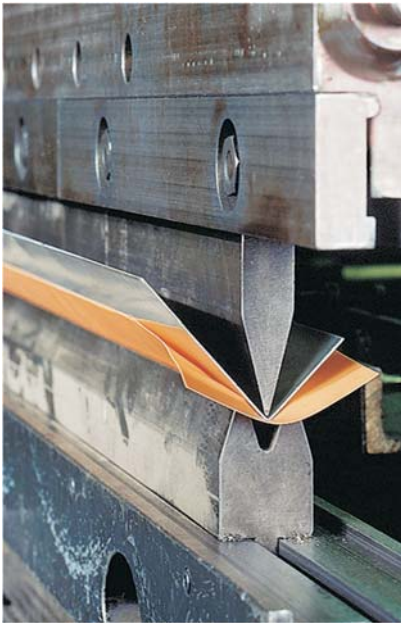
ORDERING DIFFERENT DUROMETERS

Standard part numbers in this catalog represent 95 A Tan, unless otherwise specified. To order other durometers, you must specify the first letter of the product color after the part number.

EXAMPLE: If you want an 85A Red durometer spring, you will add an "R" to the end of the part number ML316-100R.

70 A Durometer Black = B 90 A Durometer Yellow = Y
85 A Durometer Red = R 95 A Durometer Tan is standard

Die-Cover Film



Ideal for your press-brake forming application.

With FORMATHANE Die-Cover Film, you can form decorative and pre-painted metals without die marks while using your existing metal dies. Join the many metal fabricators who have improved their productivity by reducing or eliminating the refinishing work required to remove die marks.



Note the die marks on the bottom angle formed with steel dies, compared to the unblemished top angle, formed with the same dies and FORMATHANE Die-Cover Film.

Size	.020" Thickness Part Number	.031" Thickness Part Number
4" on 50' rolls	DCF04-050652	DCF04-050652031
4" on 100' rolls	DCF04-100652	DCF04-100652031
6" on 50' rolls	DCF06-050652	DCF06-050652031
6" on 100' rolls	DCF06-100652	DCF06-100652031
8" on 100' rolls	DCF08-100652	DCF08-100652031
12" on 100' rolls	DCF12-100652	DCF12-100652031
36" on 10'	DCF36-010652	DCF36-652031

How does it work?

This film acts as a buffer between the sharp edges of the die and the polished or pre-painted metal piece being formed, protecting this metal from die marks. Simply cover the lower metal die with our FORMATHANE die cover film.

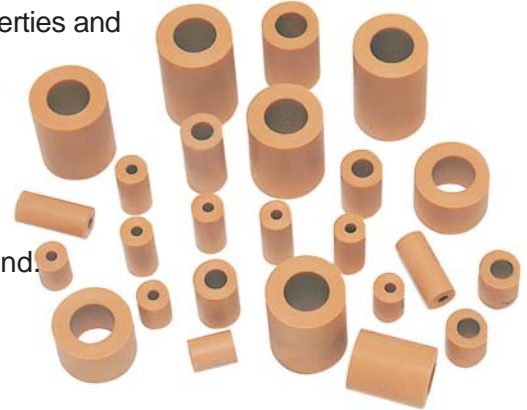
Hit after hit... you won't find a tougher, longer-lasting die cover film!

"I use this die-cover film to eliminate tool marks on a decorative polished aluminum job. I have hit over 50,000 parts on a single piece of your film." (90° bend; 0.187" thick)

Light Duty Springs & Tube Stock

The use of urethane springs in stamping and punching dies is not new to the metal fabricating industry. However, the unique physical properties and quality engineered into our FORMATHANE springs, tubes and strippers is new. We encourage you to compare... and put FORMATHANE to the test.

- Springs and strippers are stocked in our 95 Shore 'A' durometer compound.
- Tubes are available in any standard FORMATHANE compound.



FORMATHANE Light Duty Springs

Fits Punch Dia.	Outside Dia.	Length	95 A TAN Part Number	Pounds Required to deflect			Bulge at 1/2"
				1/8"	1/4"	1/2"	
3/16"	11/16"	1"	ML316-100	225	398	1234	0.35
		1-1/4"	ML316-125	219	375	1036	0.25
		1-1/2"	ML316-150	215	359	904	0.20
		12"	ML316-12L	-	-	-	-
1/4"	3/4"	1"	ML104-100	240	447	1101	0.41
		1-1/4"	ML104-125	224	410	975	0.30
		1-1/2"	ML104-150	208	367	790	0.24
		1-3/4"	ML104-175	195	344	703	0.23
		12"	ML104-12L	-	-	-	-
5/16"	13/16"	1"	ML516-100	288	491	1189	0.42
		1-1/4"	ML516-125	264	448	1037	0.31
		1-1/2"	ML516-150	248	419	936	0.24
		1-3/4"	ML516-175	237	398	863	0.19
		2"	ML516-200	228	383	809	0.15
		12"	ML516-12L	-	-	-	-
3/8"	7/8"	1"	ML308-100	293	495	1027	0.26
		1-1/4"	ML308-125	272	457	957	0.22
		1-1/2"	ML308-150	258	431	910	0.20
		1-3/4"	ML308-175	248	413	876	0.18
		2"	ML308-200	240	399	851	0.17
		12"	ML308-12L	-	-	-	-
1/2"	1"	1"	ML102-100	340	567	1143	0.41
		1-1/4"	ML102-125	279	478	1025	0.39
		1-1/2"	ML102-150	239	418	946	0.37
		1-3/4"	ML102-175	231	397	878	0.24
		2"	ML102-200	213	369	834	0.21
		12"	ML102-12L	-	-	-	-
		24"	ML102-24L	-	-	-	-

Tolerances:

Outside Diameters 11/16" - 1/2" ± 0.015"

1-5/8" - 2-3/4" ± 0.020"

Inside Diameters 3/16" - 1-1/2" - 0.005" / - 0.020"

Length (All) +0.015" / + 0.046"

NOTE: Please refer to the durometer/color/ordering information on page 3.

Fits Punch Dia.	Outside Dia.	Length	95 A TAN Part Number	Pounds Required to deflect			Bulge at 1/2"
				1/8"	1/4"	1/2"	
5/8"	1-1/8"	1"	ML508-100	414	677	1224	0.43
		1-1/4"	ML508-125	369	609	1169	0.34
		1-1/2"	ML508-150	339	564	1133	0.28
		1-3/4"	ML508-175	317	531	1107	0.23
		2"	ML508-200	301	507	1087	0.20
		12"	ML508-12L	-	-	-	-
		24"	ML508-24L	-	-	-	-
		3/4"	1-3/8"	1-1/4"	ML304-125	507	859
1-1/2"	ML304-150			471	800	1623	0.41
1-3/4"	ML304-175			446	758	1550	0.34
2"	ML304-200			427	726	1495	0.29
2-1/4"	ML304-225			412	702	1452	0.25
2-1/2"	ML304-250			400	682	1418	0.22
12"	ML304-12L			-	-	-	-
24"	ML304-24L			-	-	-	-
7/8"	1-5/8"	1-1/4"	ML708-125	719	1234	2619	0.53
		1-1/2"	ML708-150	678	1125	2363	0.52
		1-3/4"	ML708-175	631	1057	2213	0.47
		2"	ML708-200	618	1032	2141	0.35
		2-1/4"	ML708-225	591	1000	2072	0.28
		2-1/2"	ML708-250	549	927	1846	0.25
		2-3/4"	ML708-275	541	899	1741	0.21
		3"	ML708-300	520	889	1720	0.18
		12"	ML708-12L	-	-	-	-
		24"	ML708-24L	-	-	-	-
1"	1-3/4"	1-1/4"	ML1000-125	854	1412	2782	0.55
		1-1/2"	ML1000-150	790	1314	2588	0.45
		1-3/4"	ML1000-175	744	1244	2450	0.38
		2"	ML1000-200	710	1192	2346	0.33
		2-1/4"	ML1000-225	683	1151	2265	0.29
		2-1/2"	ML1000-250	662	1119	2201	0.26
		2-3/4"	ML1000-275	644	1092	2148	0.23
		12"	ML1000-12L	-	-	-	-
		24"	ML1000-24L	-	-	-	-

Medium Duty Springs & Tube Stock



The Advantages of FORMATHANE vs. Metal Springs/Strippers

- FORMATHANE generates higher blank-holding pressure for any given diameter size... allowing closer center-to-center spacing to overcome die space limitations.
- FORMATHANE is quieter in operation and helps to dampen punch vibration.
- FORMATHANE will not fracture under load, so both operators and dies are protected from shrapnel.
- FORMATHANE adjusts for die misalignment automatically and installs easily, saving set-up time.
- FORMATHANE is nonmagnetic and non-marring.
- FORMATHANE is resistant to corrosion and most oils and chemicals used in the metalforming environment.

FORMATHANE Medium Duty Springs

See page 15 for Springs in metric sizes.

Fits Punch Dia.	Outside Dia.	Length	95 A TAN Part Number	Pounds Required to deflect			Bulge at 3/8"
				1/8"	1/4"	3/8"	
3/16"	13/16"	1	MM316-100	334	634	1125	0.24
		1-1/4"	MM316-125	307	569	983	0.19
		1-1/2"	MM316-150	289	526	889	0.16
		12"	MM316-12L	-	-	-	-
1/4"	7/8"	1"	MM104-100	359	671	1294	0.27
		1-1/4"	MM104-125	329	603	1131	0.22
		1-1/2"	MM104-150	309	558	1022	0.19
		12"	MM104-12L	-	-	-	-
3/8"	1"	1"	MM308-100	436	802	1501	0.31
		1-1/4"	MM308-125	396	716	1265	0.23
		1-1/2"	MM308-150	370	659	1108	0.18
		1-3/4"	MM308-175	351	618	996	0.15
		2"	MM308-200	337	587	912	0.12
		12"	MM308-12L	-	-	-	-
1/2"	1-1/8"	1"	MM102-100	531	958	1709	0.36
		1-1/4"	MM102-125	486	866	1475	0.28
		1-1/2"	MM102-150	456	805	1318	0.22
		1-3/4"	MM102-175	434	762	1207	0.18
		2"	MM102-200	418	729	1123	0.16
		12"	MM102-12L	-	-	-	-
		24"	MM102-24L	-	-	-	-
5/8"	1-1/4"	1"	MM508-100	584	1058	1855	0.38
		1-1/4"	MM508-125	578	982	1624	0.31
		1-1/2"	MM508-150	459	797	1310	0.28
		1-3/4"	MM508-175	445	749	1232	0.21
		2"	MM508-200	427	709	1185	0.17
		12"	MM508-12L	-	-	-	-
		24"	MM508-24L	-	-	-	-

Fits Punch Dia.	Outside Dia.	Length	95 A TAN Part Number	Pounds Required to deflect			Bulge at 3/8"
				1/8"	1/4"	3/8"	
3/4"	1-1/2"	1-1/4"	MM304-125	792	1406	2390	0.35
		1-1/2"	MM304-150	723	1279	2105	0.28
		1-3/4"	MM304-175	674	1188	1902	0.23
		2"	MM304-200	637	1119	1749	0.20
		2-1/4"	MM304-225	609	1066	1631	0.17
		2-1/2"	MM304-250	586	1024	1536	0.15
		2-3/4"	MM304-275	567	989	1458	0.13
		12"	MM304-12L	-	-	-	-
		24"	MM304-24L	-	-	-	-
		7/8"	1-3/4"	1-1/2"	MM708-150	1037	1885
1-3/4"	MM708-175			933	1685	2780	0.30
2"	MM708-200			856	1535	2464	0.26
2-1/4"	MM708-225			795	1418	2218	0.22
2-1/2"	MM708-250			747	1324	2021	0.19
2-3/4"	MM708-275			707	1248	1860	0.16
3"	MM708-300			674	1184	1726	0.14
12"	MM708-12L			-	-	-	-
24"	MM708-24L			-	-	-	-
1"	2"			1-1/4"	MM1000-125	1308	2427
		1-1/2"	MM1000-150	1060	1983	3330	0.34
		1-3/4"	MM1000-175	965	1791	2911	0.30
		2"	MM1000-200	949	1680	2624	0.25
		2-1/4"	MM1000-225	813	1517	2367	0.23
		2-1/2"	MM1000-250	805	1482	2262	0.22
		2-3/4"	MM1000-275	768	1400	2121	0.18
		3"	MM1000-300	755	1378	1985	0.16
		4"	MM1000-400	750	1368	1963	0.11
		12"	MM1000-12L	-	-	-	-
		24"	MM1000-24L	-	-	-	-

Tolerances:

Outside Diameters 11/16" - 1-1/2" ± 0.015"

1-5/8" - 2-3/4" ± 0.020"

Inside Diameters 3/16" - 1-1/2" - 0.005" / - 0.020"

Length (All) + 0.015" / + 0.046"

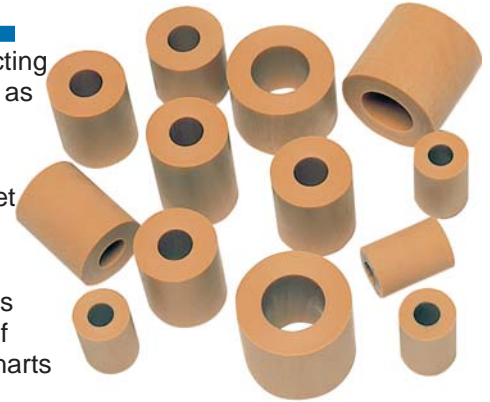
NOTE: Please refer to the durometer/color/ordering information on page 3.

Heavy Duty Springs

FORMATHANE springs are available for light, medium and heavy duty service. Selecting the proper service level for your application will depend on a number of factors, such as stock thickness, space limitations and the amount of deflection desired.

The I.D. of all FORMATHANE springs and strippers are molded slightly undersize to provide for a "press fit" onto the punch body. This feature eliminates the need for a set screw or stripper bolt when installing our springs - helping to reduce set-up time.

Hysteresis (internal heat build-up) is the most common cause of premature urethane spring failure. Since the amount of heat generated is a result of the number of strokes per hour combined with the amount of spring deflection, minimizing the percentage of deflection will extend the working life of the spring. Carefully review our load range charts when making your spring selections to avoid over-compression.



NOTE: Please refer to the durometer/color/ordering information on page 3.

FORMATHANE Heavy Duty Springs

Fits Punch Dia.	Outside Dia.	Length	95 A TAN Part Number	Pounds Required to deflect			Bulge at 3/8"
				1/8"	1/4"	3/8"	
1/4"	1"	1	MH104-100	418	808	1543	0.28
		1-1/4"	MH104-125	389	721	1266	0.19
		1-1/2"	MH104-150	354	648	1082	0.17
		1-3/4"	MH104-175	331	587	933	0.15
		12"	MH104-12L	-	-	-	-
3/8"	1-1/8"	1"	MH308-100	613	1109	2071	0.34
		1-1/4"	MH308-125	554	983	1729	0.27
		1-1/2"	MH308-150	514	899	1501	0.22
		1-3/4"	MH308-175	486	839	1338	0.19
		2"	MH308-200	465	794	1216	0.16
		12"	MH308-12L	-	-	-	-
1/2"	1-1/4"	1"	MH102-100	597	1155	2188	0.35
		1-1/4"	MH102-125	532	1001	1793	0.27
		1-1/2"	MH102-150	489	898	1529	0.22
		1-3/4"	MH102-175	458	824	1341	0.18
		2"	MH102-200	435	769	1200	0.15
		12"	MH102-12L	-	-	-	-
		24"	MH102-24L	-	-	-	-
5/8"	1-3/8"	1"	MH508-100	796	1409	2462	0.39
		1-1/4"	MH508-125	721	1269	2129	0.31
		1-1/2"	MH508-150	671	1175	1907	0.26
		1-3/4"	MH508-175	636	1108	1749	0.23
		2"	MH508-200	609	1058	1630	0.20
		12"	MH508-12L	-	-	-	-
3/4"	1-3/4"	1-1/4"	MH304-125	1167	2130	3682	0.34
		1-1/2"	MH304-150	1056	1909	3191	0.28
		1-3/4"	MH304-175	976	1751	2841	0.24
		2"	MH304-200	917	1632	2578	0.21
		2-1/4"	MH304-225	870	1540	2373	0.19
		2-1/2"	MH304-250	833	1466	2210	0.17
		2-3/4"	MH304-275	803	1406	2076	0.15
		12"	MH304-12L	-	-	-	-
		24"	MH304-24L	-	-	-	-

Fits Punch Dia.	Outside Dia.	Length	95 A TAN Part Number	Pounds Required to deflect			Bulge at 3/8"
				1/8"	1/4"	3/8"	
7/8"	2"	1-1/2"	MH708-150	1364	2467	4079	0.32
		1-3/4"	MH708-175	1253	2254	3630	0.27
		2"	MH708-200	1170	2095	3294	0.24
		2-1/4"	MH708-225	1105	1970	3032	0.21
		2-1/2"	MH708-250	1054	1871	2823	0.18
		2-3/4"	MH708-275	1011	1790	2652	0.17
		3"	MH708-300	976	1722	2509	0.15
		12"	MH708-12L	-	-	-	-
		24"	MH708-24L	-	-	-	-
		1"	2-1/4"	1-1/2"	MH1000-150	1480	2777
1-3/4"	MH1000-175			1363	2529	4129	0.28
2"	MH1000-200			1275	2343	3790	0.25
2-1/4"	MH1000-225			1207	2199	3525	0.22
2-1/2"	MH1000-250			1152	2083	3314	0.20
2-3/4"	MH1000-275			1077	1958	3061	0.18
3"	MH1000-300			1014	1853	2851	0.16
4"	MH1000-400			841	1566	2272	0.12
12"	MH1000-12L			-	-	-	-
24"	MH1000-24L			-	-	-	-
1-1/4"	2-1/2"	2"	MH1104-200	1674	36009	4637	0.30
		2-1/4"	MH1104-225	1562	2810	4264	0.26
		2-1/2"	MH1104-250	1473	2650	3966	0.23
		2-3/4"	MH1104-275	1400	2520	3721	0.21
		3"	MH1104-300	1339	2411	3518	0.19
		12"	MH1104-12L	-	-	-	-
		24"	MH1104-24L	-	-	-	-
1-1/2"	2-3/4"	2"	MH1102-200	1656	3081	4795	0.28
		2-1/4"	MH1102-225	1575	2917	4440	0.27
		2-1/2"	MH1102-250	1561	2794	4157	0.26
		2-3/4"	MH1102-275	1495	2666	3917	0.25
		3"	MH1102-300	1300	2424	3586	0.21
		12"	MH1102-12L	-	-	-	-
		24"	MH1102-24L	-	-	-	-

Tolerances:

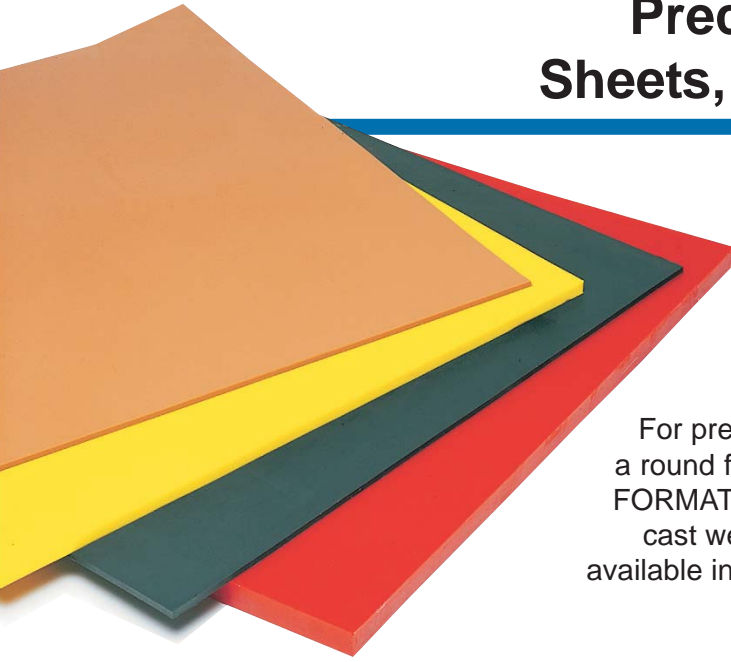
Outside Diameters 11/16" - 1-1/2" ± 0.015"

1-5/8" - 2-3/4" ± 0.020"

Inside Diameters 3/16" - 1-1/2" - 0.005" / - 0.020"

Length (All) + 0.015" / + 0.046"

Precision-Cast Sheets, Slabs & Discs



For press designs using a round forming chamber, FORMATHANE precision-cast wear pad discs are available in eight diameters.

FORMATHANE Discs & Wear Pads

Thickness tolerance $\pm .015"$

85 A RED Part #	Diameter Tolerance	Size
MD-09-025R	$\pm 1/8"$	9" dia. x 0.25" thick
MD-12-025R	$\pm 1/8"$	12" dia. x 0.25" thick
MD-15-025R	$\pm 1/8"$	15" dia. x 0.25" thick
MD-20-025R	$\pm 3/16"$	20" dia. x 0.25" thick
MD-25-025R	$\pm 3/16"$	25" dia. x 0.25" thick
MD-26-025R	$\pm 3/16"$	26" dia. x 0.25" thick
MD-27-025R	$\pm 1/4"$	27" dia. x 0.25" thick
MD-32-025R	$\pm 1/4"$	32" dia. x 0.25" thick

Discs are stocked in PO-650 Red (85 A Durometer).

FORMATHANE sheets are available in a wide range of sizes, thickness and hardnesses to meet your metalforming requirements. Forming blocks, pressure pads, wear pads or throw pads – whatever your application – a FORMATHANE sheet or slab will fill your needs.

NOTE: Please refer to the durometer/color/ordering information on page 3.

FORMATHANE Precision-Cast Sheets - 95 A TAN

Thickness Tolerance W x L	1/16" $\pm .005"$	1/8" $\pm .010"$	3/16" $\pm .015"$	1/4" $\pm .015"$	3/8" $\pm .015"$	1/2" $\pm .015"$	5/8" $\pm .020"$	3/4" $\pm .020"$
1 x 48"	MS-0148-006	MS-0148-013	MS-0148-019	MS-0148-025	MS-0148-038	MS-0148-050	MS-0148-063	MS-0148-075
2 x 48"	MS-0248-006	MS-0248-013	MS-0248-019	MS-0248-025	MS-0248-038	MS-0248-050	MS-0248-063	MS-0248-075
3 x 48"	MS-0348-006	MS-0348-013	MS-0348-019	MS-0348-025	MS-0348-038	MS-0348-050	MS-0348-063	MS-0348-075
4 x 48"	MS-0448-006	MS-0448-013	MS-0448-019	MS-0448-025	MS-0448-038	MS-0448-050	MS-0448-063	MS-0448-075
6 x 6"	MS-0606-006	MS-0606-013	MS-0606-019	MS-0606-025	MS-0606-038	MS-0606-050	MS-0606-063	MS-0606-075
6 x 12"	MS-0612-006	MS-0612-013	MS-0612-019	MS-0612-025	MS-0612-038	MS-0612-050	MS-0612-063	MS-0612-075
6 x 18"	MS-0618-006	MS-0618-013	MS-0618-019	MS-0618-025	MS-0618-038	MS-0618-050	MS-0618-063	MS-0618-075
6 x 24"	MS-0624-006	MS-0624-013	MS-0624-019	MS-0624-025	MS-0624-038	MS-0624-050	MS-0624-063	MS-0624-075
6 x 36"	MS-0636-006	MS-0636-013	MS-0636-019	MS-0636-025	MS-0636-038	MS-0636-050	MS-0636-063	MS-0636-075
6 x 48"	MS-0648-006	MS-0648-013	MS-0648-019	MS-0648-025	MS-0648-038	MS-0648-050	MS-0648-063	MS-0648-075
12 x 12"	MS-1212-006	MS-1212-013	MS-1212-019	MS-1212-025	MS-1212-038	MS-1212-050	MS-1212-063	MS-1212-075
12 x 18"	MS-1218-006	MS-1218-013	MS-1218-019	MS-1218-025	MS-1218-038	MS-1218-050	MS-1218-063	MS-1218-075
12 x 24"	MS-1224-006	MS-1224-013	MS-1224-019	MS-1224-025	MS-1224-038	MS-1224-050	MS-1224-063	MS-1224-075
12 x 36"	MS-1236-006	MS-1236-013	MS-1236-019	MS-1236-025	MS-1236-038	MS-1236-050	MS-1236-063	MS-1236-075
12 x 48"	MS-1248-006	MS-1248-013	MS-1248-019	MS-1248-025	MS-1248-038	MS-1248-050	MS-1248-063	MS-1248-075
18 x 18"	MS-1818-006	MS-1818-013	MS-1818-019	MS-1818-025	MS-1818-038	MS-1818-050	MS-1818-063	MS-1818-075
18 x 24"	MS-1824-006	MS-1824-013	MS-1824-019	MS-1824-025	MS-1824-038	MS-1824-050	MS-1824-063	MS-1824-075
18 x 36"	MS-1836-006	MS-1836-013	MS-1836-019	MS-1836-025	MS-1836-038	MS-1836-050	MS-1836-063	MS-1836-075
18 x 48"	MS-1848-006	MS-1848-013	MS-1848-019	MS-1848-025	MS-1848-038	MS-1848-050	MS-1848-063	MS-1848-075
24 x 24"	MS-2424-006	MS-2424-013	MS-2424-019	MS-2424-025	MS-2424-038	MS-2424-050	MS-2424-063	MS-2424-075
24 x 36"	MS-2436-006	MS-2436-013	MS-2436-019	MS-2436-025	MS-2436-038	MS-2436-050	MS-2436-063	MS-2436-075
24 x 48"	MS-2448-006	MS-2448-013	MS-2448-019	MS-2448-025	MS-2448-038	MS-2448-050	MS-2448-063	MS-2448-075
36 x 36"	MS-3636-006	MS-3636-013	MS-3636-019	MS-3636-025	MS-3636-038	MS-3636-050	MS-3636-063	MS-3636-075

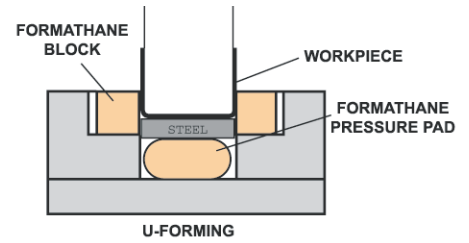
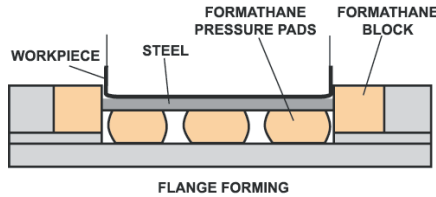
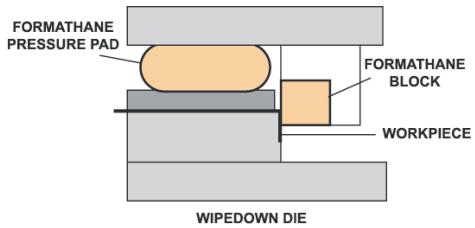
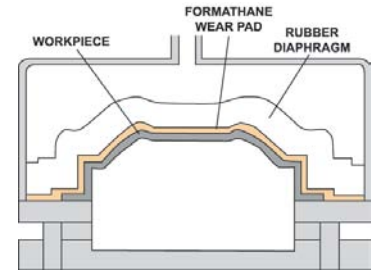
Width and length tolerance $+1/8" / -0"$

Available in any of our four standard FORMATHANE compounds.

Precision-Cast Sheets, Slabs & Discs

Proven to withstand pressures from under 5,000 psi up to 30,000 psi, our FORMATHANE urethane stands up to the tortuous pressing of the fluid-forming process. In fact, they actually assist the metalforming process by allowing intricate, mar-free shapes to be produced without additional secondary finishing operations.

Our FORMATHANE sheets offer superior cut, puncture and abrasion resistance. Our high-performance urethane compounds will not break down, leaving particulate debris on your parts or equipment. Their typical, long service life makes FORMATHANE sheets the material of choice in demanding metalforming applications.



NOTE: Please refer to the durometer/color/ordering information on page 3.

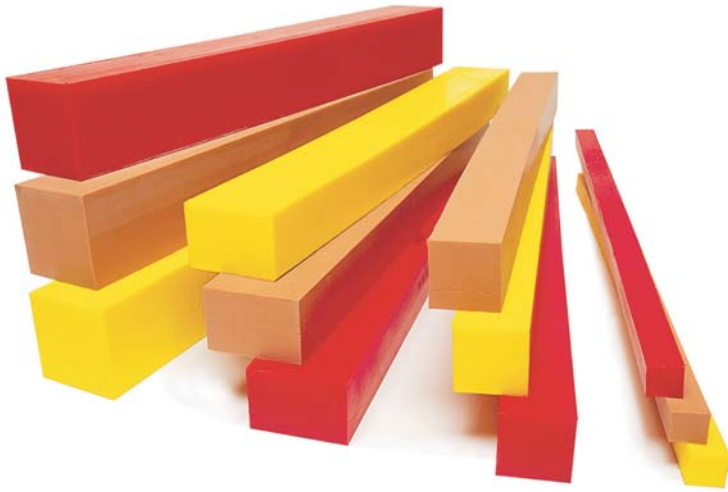
FORMATHANE Precision-Cast Sheets - 95 A TAN

Thickness Tolerance W x L	1" ± .020"	1-1/4" ± .025"	1-1/2" + .015" / - .030"	2" + .015" / - .030"	2-1/2" + .015" / - .035"	3" + .015" / - .060"	3-1/2" + .015" / - .060"	4" + .015" / - .070"
1 x 48"	MS-0148-100	MS-0148-125	MS-0148-150	MS-0148-200	MS-0148-250	MS-0148-300	MS-0148-350	MS-0148-400
2 x 48"	MS-0248-100	MS-0248-125	MS-0248-150	MS-0248-200	MS-0248-250	MS-0248-300	MS-0248-350	MS-0248-400
3 x 48"	MS-0348-100	MS-0348-125	MS-0348-150	MS-0348-200	MS-0348-250	MS-0348-300	MS-0348-350	MS-0348-400
4 x 48"	MS-0448-100	MS-0448-125	MS-0448-150	MS-0448-200	MS-0448-250	MS-0448-300	MS-0448-350	MS-0448-400
6 x 6"	MS-0606-100	MS-0606-125	MS-0606-150	MS-0606-200	MS-0606-250	MS-0606-300	MS-0606-350	MS-0606-400
6 x 12"	MS-0612-100	MS-0612-125	MS-0612-150	MS-0612-200	MS-0612-250	MS-0612-300	MS-0612-350	MS-0612-400
6 x 18"	MS-0618-100	MS-0618-125	MS-0618-150	MS-0618-200	MS-0618-250	MS-0618-300	MS-0618-350	MS-0618-400
6 x 24"	MS-0624-100	MS-0624-125	MS-0624-150	MS-0624-200	MS-0624-250	MS-0624-300	MS-0624-350	MS-0624-400
6 x 36"	MS-0636-100	MS-0636-125	MS-0636-150	MS-0636-200	MS-0636-250	MS-0636-300	MS-0636-350	MS-0636-400
6 x 48"	MS-0648-100	MS-0648-125	MS-0648-150	MS-0648-200	MS-0648-250	MS-0648-300	MS-0648-350	MS-0648-400
12 x 12"	MS-1212-100	MS-1212-125	MS-1212-150	MS-1212-200	MS-1212-250	MS-1212-300	MS-1212-350	MS-1212-400
12 x 18"	MS-1218-100	MS-1218-125	MS-1218-150	MS-1218-200	MS-1218-250	MS-1218-300	MS-1218-350	MS-1218-400
12 x 24"	MS-1224-100	MS-1224-125	MS-1224-150	MS-1224-200	MS-1224-250	MS-1224-300	MS-1224-350	MS-1224-400
12 x 36"	MS-1236-100	MS-1236-125	MS-1236-150	MS-1236-200	MS-1236-250	MS-1236-300	MS-1236-350	MS-1236-400
12 x 48"	MS-1248-100	MS-1248-125	MS-1248-150	MS-1248-200	MS-1248-250	MS-1248-300	MS-1248-350	MS-1248-400
18 x 18"	MS-1818-100	MS-1818-125	MS-1818-150	MS-1818-200	MS-1818-250	MS-1818-300	MS-1818-350	MS-1818-400
18 x 24"	MS-1824-100	MS-1824-125	MS-1824-150	MS-1824-200	MS-1824-250	MS-1824-300	MS-1824-350	MS-1824-400
18 x 36"	MS-1836-100	MS-1836-125	MS-1836-150	MS-1836-200	MS-1836-250	MS-1836-300	MS-1836-350	MS-1836-400
18 x 48"	MS-1848-100	MS-1848-125	MS-1848-150	MS-1848-200	MS-1848-250	MS-1848-300	MS-1848-350	MS-1848-400
24 x 24"	MS-2424-100	MS-2424-125	MS-2424-150	MS-2424-200	MS-2424-250	MS-2424-300	MS-2424-350	MS-2424-400
24 x 36"	MS-2436-100	MS-2436-125	MS-2436-150	MS-2436-200	MS-2436-250	MS-2436-300	MS-2436-350	MS-2436-400
24 x 48"	MS-2448-100	MS-2448-125	MS-2448-150	MS-2448-200	MS-2448-250	MS-2448-300	MS-2448-350	MS-2448-400
36 x 36"	MS-3636-100	MS-3636-125	MS-3636-150	MS-3636-200	MS-3636-250	MS-3636-300	MS-3636-350	MS-3636-400

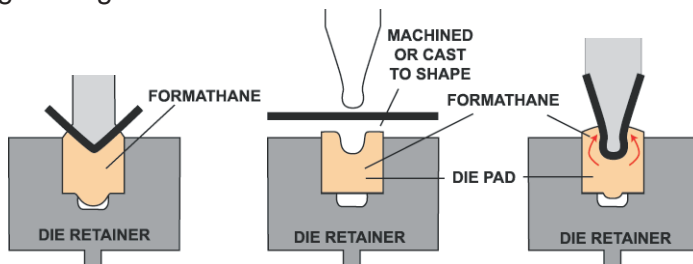
Width and length tolerance +1/8" / -0"

Available in any of our four standard FORMATHANE compounds.

Precision-Cast Bars, Blocks & Rods



As with all standard shaped items in our FORMATHANE product line, molded bars and rods are currently offered in numerous sizes to meet your metalforming needs (55 U.S. and 30 metric). The ability of FORMATHANE to deform when compressed, then recover to its original shape, makes it ideal for many metalforming applications. When a compressive load is applied, FORMATHANE reacts by distributing the force in all directions. This characteristic enables the urethane to exert pressure uniformly over the workpiece. Additionally, FORMATHANE can absorb operator and press errors, reducing damage.



- Use FORMATHANE bars as a “universal” female forming die section to eliminate the need for more expensive matched hard tooling.
- Use a FORMATHANE bar to eliminate a series of mechanical die springs or strippers in stamping dies for reduced tooling expense and shorter build time.
- Use FORMATHANE bars and blocks in pressure-pad, forming and wiping block applications for reduced tooling expense and scratch/mar-free forming.
- Use FORMATHANE bars, blocks and rods as spacers to reduce noise and vibration.
- Use FORMATHANE bar, block and rod stock to machine custom shapes for special metalforming applications.

**See page 15 for
Precision-Cast Bars
in metric sizes.**

NOTE: Please refer to the durometer/color/ordering information on page 3.

FORMATHANE Precision-Cast Bars - 95 A TAN

Length		2"	12"	24"	36"	48"
Width x Height	Tolerance					
1/2" x 1/2"	± .015"	MB-005005-2	MB-005005-12	MB-005005-24	MB-005005-36	MB-005005-48
3/4" x 3/4"		MB-075075-2	MB-075075-12	MB-075075-24	MB-075075-36	MB-075075-48
1" x 1"		MB-100100-2	MB-100100-12	MB-100100-24	MB-100100-36	MB-100100-48
1-1/4" x 1-1/4"		MB-125125-2	MB-125125-12	MB-125125-24	MB-125125-36	MB-125125-48
1-1/2" x 1-1/2"		MB-150150-2	MB-150150-12	MB-150150-24	MB-150150-36	MB-150150-48
2" x 2"	± .030"	MB-200200-2	MB-200200-12	MB-200200-24	MB-200200-36	MB-200200-48
2" x 3"		MB-200300-2	MB-200300-12	MB-200300-24	MB-200300-36	MB-200300-48
3" x 3"		MB-300300-2	MB-300300-12	MB-300300-24	MB-300300-36	MB-300300-48
4" x 4"	± .040"	MB-400400-2	MB-400400-12	MB-400400-24	MB-400400-36	MB-400400-48
5" x 5"	± .060"	MB-500500-2	MB-500500-12	MB-500500-24	MB-500500-36	MB-500500-48
6" x 6"		MB-600600-2	MB-600600-12	MB-600600-24	MB-600600-36	MB-600600-48

Length tolerance +1/8" / -0"

Available in any of our four standard FORMATHANE compounds.

Precision-Cast Bars, Blocks & Rods



Some metalforming and special application tooling calls for round rod stock. FORMATHANE Urethane rods are ideal for prototype parts or high-volume applications that are best suited for round profiles held to precision tolerances.

- All FORMATHANE products are easily machined.
- Currently, we produce 24 U.S. and 12 metric sizes of molded rods.

**See page 15 for
Precision-Cast Bars
in metric sizes.**

NOTE: Please refer to the durometer/color/ordering information on page 3.

FORMATHANE Precision-Cast Rods - 95 A TAN

Length		3"	6"	12"	24"	36"	48"
Diameter	O.D. Tolerance						
1/4"	± .010"	MR-025-03	MR-025-06	MR-025-12	MR-025-24	–	–
3/8"		MR-038-03	MR-038-06	MR-038-12	–	–	–
1/2"		MR-050-03	MR-050-06	MR-050-12	MR-050-24	MR-050-36	MR-050-48
5/8"		MR-063-03	MR-063-06	MR-063-12	MR-063-24	MR-063-36	MR-063-48
3/4"	± .015"	MR-075-03	MR-075-06	MR-075-12	MR-075-24	MR-075-36	MR-075-48
7/8"		MR-087-03	MR-087-06	MR-087-12	MR-087-24	MR-087-36	MR-087-48
1"		MR-100-03	MR-100-06	MR-100-12	MR-100-24	MR-100-36	MR-100-48
1-1/4"		MR-125-03	MR-125-06	MR-125-12	MR-125-24	MR-125-36	MR-125-48
1-1/2"		MR-150-03	MR-150-06	MR-150-12	MR-150-24	MR-150-36	MR-150-48
1-3/4"		MR-175-03	MR-175-06	MR-175-12	MR-175-24	MR-175-36	MR-175-48
2"	± .020"	MR-200-03	MR-200-06	MR-200-12	MR-200-24	MR-200-36	MR-200-48
2-1/4"		MR-225-03	MR-225-06	MR-225-12	MR-225-24	MR-225-36	MR-225-48
2-1/2"		MR-250-03	MR-250-06	MR-250-12	MR-250-24	MR-250-36	MR-250-48
2-3/4"		MR-275-03	MR-275-06	MR-275-12	MR-275-24	MR-275-36	MR-275-48
3"	± .030"	MR-300-03	MR-300-06	MR-300-12	MR-300-24	MR-300-36	MR-300-48
3-1/4"		MR-325-03	MR-325-06	MR-325-12	MR-325-24	MR-325-36	MR-325-48
3-1/2"		MR-350-03	MR-350-06	MR-350-12	MR-350-24	MR-350-36	MR-350-48
3-3/4"		MR-375-03	MR-375-06	MR-375-12	MR-375-24	MR-375-36	MR-375-48
4"	± .040"	MR-400-03	MR-400-06	MR-400-12	MR-400-24	MR-400-36	MR-400-48
4-1/2"		MR-450-03	MR-450-06	MR-450-12	MR-450-24	MR-450-36	MR-450-48
5"	± .060"	MR-500-03	MR-500-06	MR-500-12	MR-500-24	–	–
6"		MR-600-03	MR-600-06	MR-600-12	MR-600-24	–	–
7"		MR-700-03	MR-700-06	MR-700-12	MR-700-24	–	–
8"		MR-800-03	MR-800-06	MR-800-12	MR-800-24	–	–

Length tolerance +1/8" / -0"

Available in any of our four standard FORMATHANE compounds.

Headed NAAMS™ Strippers



FORMATHANE headed strippers fully meet the NAAMS™ standard. The closed-end design allows for custom matching of the stripper face to the shape of your punch.

The headed design prevents the stripper from falling off the punch and into the die.

- Strippers are stocked in 95 A durometer.
- Molded to meet or exceed the new NAAMS Headed Stripper Standards.
- Manufactured from the highest performance urethane compound; provides long life.
- Each stripper resists taking a compression set providing consistent stripper forces throughout the life of the stripper.
- The unique molding process produces strippers that resist splitting and tearing keeping unwanted debris out of the die.

Load Ratings in Newtons

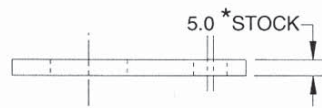
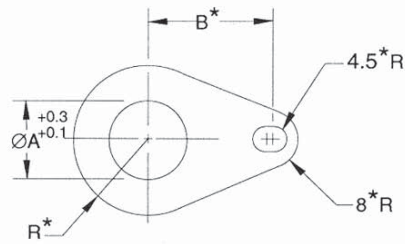
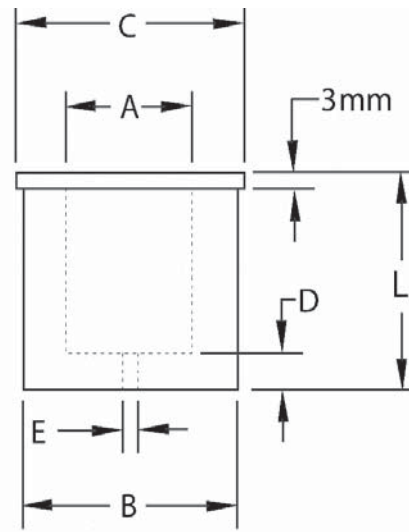
Punch Dia. mm	Outside Dia. B mm	Length L mm	95 A TAN Part Number	Newtons Required to deflect			NAAMS Code
				3mm	6mm	9mm	
10	18	44	MTH-10-44	721	1237	1966	P051044
		54	MTH-10-54	694	1179	1770	P051054
		64	MTH-10-64	689	1121	1610	P051064
		74	MTH-10-74	654	1036	1446	P051074
13	23	44	MTH-13-44	1303	2184	3380	P051344
		54	MTH-13-54	1179	2028	3118	P051354
		64	MTH-13-64	1023	1775	2580	P051364
		74	MTH-13-74	907	1508	2175	P051374
16	28	44	MTH-16-44	1548	2655	4159	P051644
		54	MTH-16-54	1406	2402	3696	P051654
		64	MTH-16-64	1263	2277	3340	P051664
		74	MTH-16-74	1121	1868	2807	P051674
20	33	44	MTH-20-44	2139	3683	5711	P052044
		54	MTH-20-54	2002	3389	5253	P052054
		64	MTH-20-64	1864	3211	4653	P052064
		74	MTH-20-74	1730	2936	4230	P052074
25	40	44	MTH-25-44	2869	4946	7490	P052544
		54	MTH-25-54	2660	4546	6810	P052554
		64	MTH-25-64	2464	4114	5983	P052564
		74	MTH-25-74	2224	3799	5498	P052574
32	50	44	MTH-32-44	4386	7557	11672	P053244
		54	MTH-32-54	4021	6917	10373	P053254
		64	MTH-32-64	3483	6063	8918	P053264
		74	MTH-32-74	3260	5662	8207	P053274
40	60	44	MTH-40-44	5391	9830	15248	P054054
		54	MTH-40-54	4915	8651	13411	P054064
		64	MTH-40-64	4448	7953	11778	P054074

Note: 44mm long bushings should not be compressed more than 6.6mm; more compression exceeds recommended maximum of 15%.

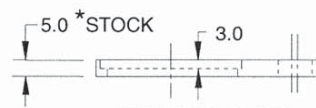
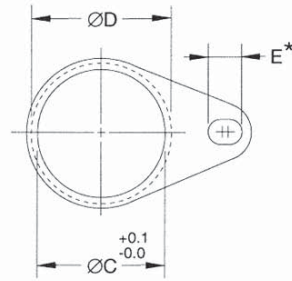
NOTE: Please refer to the durometer/color/ordering information on page 3.

Headed NAAMS™ Strippers

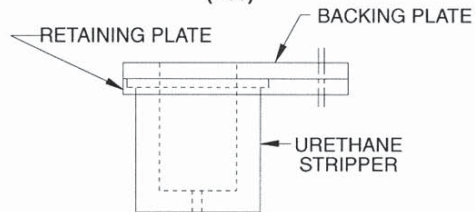
Punch Diameter mm	A Press Fit mm	C mm	D mm	E Vent Hole mm
10.0	9.75	21.3	6	1.6
13.0	12.75	26.3	6	3.0
16.0	15.75	31.3	6	3.0
20.0	19.75	36.3	7	3.0
25.0	24.75	43.3	7	3.0
32.0	31.70	55.3	7	3.0
40.0	39.70	65.3	8	3.0



BACKING PLATE (P02)



RETAINING PLATE (P03)



*Dimension common to both backing and retaining plate.

FORMATHANE Backing Plate Set

Part Number	A mm	B mm	C mm	D mm	E mm	R mm
BRP0010	10	29.0	19	22	11.0	13.0
BRP0013	13	32.0	24	27	11.0	15.5
BRP0016	16	34.0	29	32	11.0	18.0
BRP0020	20	36.0	34	37	11.5	20.5
BRP0025	25	40.6	41	44	10.5	24.0
BRP0032	32	42.0	51	56	10.5	31.0
BRP0040	40	46.0	61	66	11.0	36.0

NOTE: Please refer to the durometer/color/ordering information on page 3.

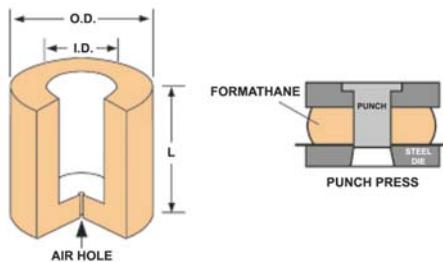
Closed-End Strippers



Closed-end FORMATHANE strippers allow for custom-matching of the stripper face to the shape of your punch. Simply press-fit the stripper onto the punch body and then complete one stroke without the metal stock. The punch will pierce the closed-end of the FORMATHANE stripper, cutting it to the exact same shape as the punch.

FORMATHANE strippers provide high blank-holding pressure on the downstroke and stripping pressure on the upstroke. This combination means less jamming of blanks.

Replace your conventional urethane strippers with long-life FORMATHANE and watch your profits increase. Your tool room can sidestep replacing worn out urethane strippers and work on more important projects.



**See page 15 for
Closed-End Strippers
in metric sizes.**

Tolerances:

Outside Diameters $\pm 0.015''$

Inside Diameters $- 0.005'' / - 0.020''$

Length $+ 0.015'' / + 0.046''$

All lengths cut to 1/32" over nominal to allow for set.

NOTE: Please refer to the durometer/color/ordering information on page 3.

FORMATHANE Closed-End Strippers

I.D.	O.D.	Length	95 A TAN Part Number	Pounds Required to deflect			Bulge at 1/2"
				1/8"	1/4"	1/2"	
3/16"	11/16"	1-1/4"	MT316-125	220	375	1035	0.25
		1-1/2"	MT316-150	215	360	900	0.20
1/4"	3/4"	1-1/4"	MT104-125	225	410	975	0.30
		1-1/2"	MT104-150	210	370	790	0.24
		1-3/4"	MT104-175	195	345	700	0.23
5/16"	13/16"	1-1/4"	MT516-125	265	450	1035	0.31
		1-1/2"	MT516-150	250	420	935	0.24
		1-3/4"	MT516-175	235	400	865	0.19
		2"	MT516-200	230	385	810	0.15
3/8"	7/8"	1-1/4"	MT308-125	270	460	960	0.22
		1-1/2"	MT308-150	260	430	910	0.20
		1-3/4"	MT308-175	250	415	875	0.18
		2"	MT308-200	240	400	850	0.17
1/2"	1"	1-1/4"	MT102-125	280	480	1025	0.39
		1-1/2"	MT102-150	240	420	945	0.37
		1-3/4"	MT102-175	230	400	880	0.24
		2"	MT102-200	215	370	835	0.21
		2-1/4"	MT102-225	200	345	800	0.19
5/8"	1-1/8"	1-1/4"	MT508-125	370	610	1170	0.34
		1-1/2"	MT508-150	340	565	1135	0.28
		1-3/4"	MT508-175	320	530	1110	0.23
		2"	MT508-200	300	510	1090	0.20
3/4"	1-1/2"	1-3/4"	MT304-175	675	1190	2090	0.24
		2"	MT304-200	640	1120	1925	0.21
		2-1/4"	MT304-225	610	1065	1790	0.18
		2-1/2"	MT304-250	585	1025	1690	0.16
		2-3/4"	MT304-275	565	990	1610	0.14
7/8"	1-3/4"	1-3/4"	MT708-175	935	1685	3050	0.31
		2"	MT708-200	855	1535	2660	0.27
		2-1/4"	MT708-225	795	1420	2395	0.23
		2-1/2"	MT708-250	745	1325	2180	0.20
		2-3/4"	MT708-275	710	1250	2010	0.17
1"	2"	1-3/4"	MT1000-175	965	1790	3115	0.31
		2"	MT1000-200	950	1680	2810	0.26
		2-1/4"	MT1000-225	815	1515	2420	0.24
		2-1/2"	MT1000-250	805	1480	2335	0.23
		2-3/4"	MT1000-275	770	1400	2270	0.19
1-1/4"	2-1/2"	2"	MT1104-200	1675	3010	4920	0.31
		2-1/4"	MT1104-225	1560	2810	4520	0.27
		2-1/2"	MT1104-250	1475	2650	4200	0.24
		2-3/4"	MT1104-275	1400	2520	3945	0.22
		3"	MT1104-300	1340	2410	3730	0.20
1-1/2"	2-3/4"	2"	MT1102-200	1655	3080	5035	0.29
		2-1/4"	MT1102-225	1575	2915	4660	0.28
		2-1/2"	MT1102-250	1560	2795	4365	0.27
		2-3/4"	MT1102-275	1495	2665	4120	0.26
		3"	MT1102-300	1300	2425	3765	0.22

Metric Sizes

Precision-Cast Bars

Width mm	Height mm	Length mm	95 A TAN Part Number
± 0.4mm	25	100	MBM-2525100
		415	MBM-2525415
		500	MBM-2525500
		835	MBM-2525835
		1000	MBM-25251000
± 0.4mm	30	100	MBM-3025100
		415	MBM-3025415
		500	MBM-3025500
		835	MBM-3025835
		1000	MBM-30251000
± 0.6mm	50	100	MBM-5050100
		415	MBM-5050415
		500	MBM-5050500
		835	MBM-5050835
		1000	MBM-50501000
± 0.8mm	80	100	MBM-8030100
		415	MBM-8030415
		500	MBM-8030500
		835	MBM-8030835
		1000	MBM-80301000
± 0.8mm	75	100	MBM-7550100
		415	MBM-7550415
		500	MBM-7550500
		835	MBM-7550835
		1000	MBM-75501000
± 0.8mm	110	100	MBM-11045100
		415	MBM-11045415
		500	MBM-11045500
		835	MBM-11045835
		1000	MBM-110451000

Tolerances—Cast Bars:

Length + 3mm / -0mm

Precision-Cast Rods

Dia. mm	Length mm	95 A TAN Part Number	Dia. mm	Length mm	95 A TAN Part Number
8	500	MRM-8500	-	-	-
10	500	MRM-10500	-	-	-
15	500	MRM-15500	-	-	-
20	500	MRM-20500	-	-	-
25	500	MRM-25500	25	1000	MRM-251000
30	500	MRM-30500	30	1000	MRM-301000
40	500	MRM-40500	40	1000	MRM-401000
50	500	MRM-50500	50	1000	MRM-501000
60	500	MRM-60500	60	1000	MRM-601000
70	500	MRM-70500	70	1000	MRM-701000
80	500	MRM-80500	80	1000	MRM-801000
100	500	MRM-100500	100	1000	MRM-1001000

Tolerances—Cast Rods:

Diameter 8mm - 40mm ± 0.4mm
 Diameter 50mm - 60mm ± 0.6mm
 Diameter 70mm - 100mm ± 0.8mm
 Length +3mm / -0

Closed-End Strippers

I.D. mm	O.D. mm	Length mm	Air Hole	95 A TAN Part Number
6	19	45	1.6	MTM-061945
		53	1.6	MTM-061953
		71	1.6	MTM-061971
8	21	45	1.6	MTM-082145
		53	1.6	MTM-082153
		71	1.6	MTM-082171
10	23	45	1.6	MTM-102345
		53	1.6	MTM-102353
		56	1.6	MTM-102356
		71	1.6	MTM-102371
		71	1.6	MTM-102371
13	26	45	3.0	MTM-132645
		53	3.0	MTM-132653
		56	3.0	MTM-132656
		71	3.0	MTM-132671
		71	3.0	MTM-132671
16	30	45	3.0	MTM-163045
		53	3.0	MTM-163053
		56	3.0	MTM-163056
		71	3.0	MTM-163071
20	38	45	3.0	MTM-203845
		53	3.0	MTM-203853
		71	3.0	MTM-203871
25	50	45	3.0	MTM-255045
		53	3.0	MTM-255053
		71	3.0	MTM-255071
		71	3.0	MTM-255071
32	60	45	3.0	MTM-326045

Tolerances—Strippers:

O.D. ± 0.4mm
 I.D. -0.1mm / -0.5mm
 Length ± 0.4mm

All lengths cut to 1mm over nominal to allow for set.

NOTE: Please refer to the durometer/color/ordering information on page 3.

Springs

I.D. mm	O.D. mm	Length mm	95 A TAN Part Number
7	15	25	MMM-71525
		30	MMM-71530
		35	MMM-71535
		40	MMM-71540
8.5	20	330	MMM-715330
		25	MMM-82025
		30	MMM-82030
		35	MMM-82035
11	25	40	MMM-82040
		330	MMM-820330
		25	MMM-112525
		30	MMM-112530
		35	MMM-112535
14	30	40	MMM-112540
		45	MMM-112545
		330	MMM-1125330
		25	MMM-143025
		30	MMM-143030
14	40	35	MMM-143035
		40	MMM-143040
		45	MMM-143045
		50	MMM-143050
		55	MMM-143055
14	50	60	MMM-143060
		500	MMM-1430500
		40	MMM-144040
		50	MMM-144050
		60	MMM-144060
14	60	500	MMM-1440500
		50	MMM-145050
		60	MMM-145060
		80	MMM-145080
		500	MMM-1450500
22	80	50	MMM-146050
		60	MMM-146060
		80	MMM-146080
		500	MMM-1460500
22	100	60	MMM-228060
		80	MMM-228080
		100	MMM-2280100
22	100	500	MMM-2280500
		80	MMM-2210080
		100	MMM-22100100
		120	MMM-22100120
22	100	500	MMM-22100500

Tolerances—Springs:

O.D. 15mm - 40mm ± 0.4mm
 O.D. 50mm - 60mm ± 0.6mm
 O.D. 80mm - 100mm ± 0.8mm
 I.D. -0.1mm / -0.5mm
 Length +3mm / -0

Automotive Metric Springs & Tube Stock

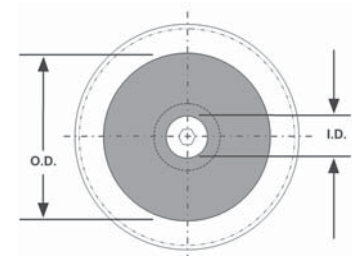
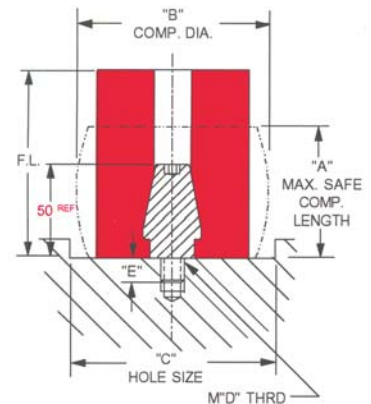
Part Number	O.D. mm	I.D. mm	F.L. mm	A Max Comp Length mm	B Max Comp O.D. mm	C Hole Size mm	D Thread Size mm	E Thread Depth mm	
MMM-145032R	50	14	32	22	62	95	12	14	
MMM-145050R			50	35	62	95	12	14	
MMM-145060R			60	42	62	95	12	14	
MMM-145080R			80	56	62	95	12	14	
MMM-145080R-T			80	56	62	95	12	14	
MMM-1450100R			100	70	62	95	12	14	
MMM-1450100R-T			100	70	62	95	12	14	
MMM-1450500R			500	FULL TUBE					
MMM-146050R	60	14	50	35	74	110	12	14	
MMM-146060R			60	42	74	110	12	14	
MMM-146060R-T			60	42	74	110	12	14	
MMM-146080R			80	56	74	110	12	14	
MMM-146080R-T			80	56	74	110	12	14	
MMM-1460100R			100	70	74	110	12	14	
MMM-1460100R-T			100	70	74	110	12	14	
MMM-1460125R			125	88	74	110	12	14	
MMM-1460125R-T	125	88	74	110	12	14			
MMM-1460500R	500	FULL TUBE							
MMM-228050R	80	22	50	35	98	135	16	18	
MMM-228060R			60	42	98	135	16	18	
MMM-228080R			80	56	98	135	16	18	
MMM-228080R-T			80	56	98	135	16	18	
MMM-2280100R			100	70	98	135	16	18	
MMM-2280100R-T			100	70	98	135	16	18	
MMM-2280125R			125	88	98	135	16	18	
MMM-2280125R-T			125	88	98	135	16	18	
MMM-2280500R	500	FULL TUBE							
MMM-2210050R	100	22	50	35	124	160	16	18	
MMM-2210080R			80	56	124	160	16	18	
MMM-2210080R-T			80	56	124	160	16	18	
MMM-22100100R			100	70	124	160	16	18	
MMM-22100100R-T			100	70	124	160	16	18	
MMM-22100125R			125	88	124	160	16	18	
MMM-22100125R-T			125	88	124	160	16	18	
MMM-22100500R			500	FULL TUBE					
MMM-2512750R	127	25	50	35	155	190	20	22	
MMM-2512780R			80	56	155	190	20	22	
MMM-2512780R-T			80	56	155	190	20	22	
MMM-25127100R			100	70	155	190	20	22	
MMM-25127100R-T			100	70	155	190	20	22	
MMM-25127125R			125	88	155	190	20	22	
MMM-25127125R-T			125	88	155	190	20	22	
MMM-25127160R			160	120	155	190	20	22	
MMM-25127160R-T			160	120	155	190	20	22	
MMM-25127915R			915	FULL TUBE					

FORMATHANE



The unique physical properties and quality engineered into our FORMATHANE® springs, tubes and strippers is new. We encourage you to compare... and put FORMATHANE® to the test.

- 85 Shore "A" hardness (red).

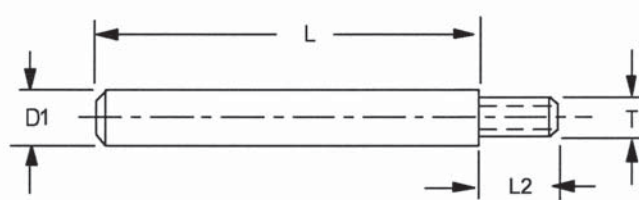
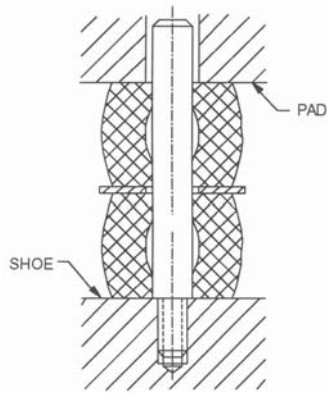


Tolerances—Springs & Tubes:
 O.D. 15mm - 40mm ± 0.4mm
 O.D. 50mm - 60mm ± 0.6mm
 O.D. 80mm - 127mm ± 0.8mm
 I.D. -0.1mm / -0.5mm
 Length +3mm / -0

NOTE:

- The "T" designation in the part number refers to springs that include a locating stud.

Automotive Metric Guide Pins, Studs & Washers

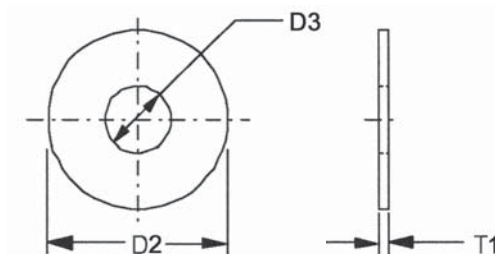


Stacking Guide Pins

Part Number	D1 mm	T	L2 mm	L mm
M12-032	13	M12	18	32
M12-040				40
M12-050				50
M12-063				63
M12-080				80
M12-095				95
M12-118				118
M12-140				140
M12-180				180
M16-050				21
M16-063	63			
M16-080	80			
M16-095	95			
M16-118	118			
M16-140	140			
M16-180	180			
M20-050	24	M20	30	50
M20-063				63
M20-080				80
M20-095				95
M20-118				118
M20-140				140
M20-180				180

Stacking Washers

Part Number	D2 mm	D3 mm	T1 mm
WASHER050	60	16.5	6
WASHER060	80	16.5	6
WASHER080	100	20.5	8
WASHER100	120	20.5	8
WASHER125	150	26.0	8



Locating Studs

Part Number	Thread	Length mm	Use with Spring I.D. mm
M12-LOCATING	M12-1.75	64	14
M16-LOCATING	M16-2.0	68	22
M20-LOCATING	M20-2.5	72	25

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