



Medalist®

Elastomers for Medical Tubing



Recent trends in the healthcare industry require new innovations in polymer technology. Medalist Thermoplastic Elastomers (TPEs) combine the performance characteristics of thermoset rubber with the processing ease of a thermoplastic; therefore they are suitable alternatives to a wide variety of medical-grade materials used today, like flexible PVC, TPU, and silicone. For medical-grade tubing, Medalist TPEs are the premier choice due to their high degree of purity (low level of extractables), biocompatibility, and optimal balance of economics and performance. Medalist TPEs are good candidates for single and multi-lumen tubing used in catheters, IV, drug delivery, gas supply, and chest drainage.

Why Medalist TPEs for Tubing?

- » Proven technology with OEMs and processors
- » Excellent extrusion rates and throughput
- » Low level of extractables
- » Low drug interaction
- » Wide service temperature range
- » Sterilization by e-beam, gamma, and ethylene oxide

Printing Suggestions for Medalist

- » Corona surface treatment is suggested for hardnesses of 70 Shore A and above
- » UV-cured inks are most effective
- » Pad printing is possible with inks formulated specifically for thermoplastic elastomers

Regulatory Compliance

- » Made with FDA compliant ingredients
- » Biocompatible, ISO 10993-5 compliant
- » REACH SVHC Compliant
- » Free of DEHP, phthalates, BPA and latex
- » Free of Animal Derived Materials (ADM)
- » Manufactured in an ISO-13485 certified facility

Connector Considerations

- » Connector bonding best achieved with light cured adhesives and cyanoacrylates
- » Male connectors provide the best pull strength

Table 1: Medalist MD-36100 Series for Opaque Medical Tubing
Applications : Urinary Catheters

Typical Properties	Color	Specific Gravity	Hardness (5 sec del)	100% Modulus	Tensile Strength	Elongation	Tear Strength (Die C, 20 in/min)	Compression Set 73°F, 22 hr	Melt Mass-Flow Rate or MFR
ASTM Test Method	---	D792	D2240	D412	D412	D412	D624	D395B	D1238
Units	---	---	Shore A	psi	psi	%	lbf/in	%	g/10 min
MD-36165	Translucent	0.9	61	265	1360	790	190	23	8.0 (200 °C, 5.0 kg)

Table 2: Medalist MD-53200 Series for Clear Medical Tubing: PVC and TPU Alternatives
Applications: Catheters, IV, Fluid Transfer, Gas Supply

Typical Properties	ASTM Test Method	Units	MD-53253	MD-53263	MD-53268	MD-53273	MD-53278	MD-53283	MD-53288	MD-53293
Appearance	---	---	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Hardness (5s delay)	D2240	Shore A	35	63	68	74	78	83	88	93
Specific Gravity	D792	---	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Melt Mass-Flow Rate (200°C/5.0 kg)	D1238	g/10 min	3.5	4.5	5	6	6.5	7.5	8.5	10
Tensile Stress (50% Strain)	D412	psi (MPa)	190 (1.31)	290 (2.00)	380 (2.62)	450 (3.10)	600 (4.14)	755 (5.21)	920 (6.34)	1270 (8.76)
Tensile Stress (100% Strain)	D412	psi (MPa)	230 (1.59)	340 (2.34)	440 (3.03)	500 (3.45)	660 (4.55)	790 (5.45)	950 (6.55)	1250 (8.62)
Tensile Stress (300% Strain)	D412	psi (MPa)	400 (2.76)	550 (3.79)	660 (4.55)	745 (5.14)	915 (6.31)	1050 (7.24)	1200 (8.27)	1400 (9.65)
Tensile Strength (Break)	D412	psi (MPa)	1650 (11.38)	1700 (11.72)	1850 (12.76)	1860 (12.82)	1930 (13.31)	2100 (14.48)	2130 (14.69)	2730 (18.82)
Tensile Elongation (Break)	D412	%	670	680	700	660	660	650	650	640
Tear Strength (Die C, 20 in/min)	D624	ibf/in (N/mm)	165 (28.90)	240 (42.03)	290 (50.79)	320 (56.04)	385 (67.42)	440 (77.06)	510 (89.31)	590 (103.32)
Compression Set 73°F, 22hr 158°F, 22hr	D395	% %	13 100	16 98	17 90	18 92	21 88	26 79	30 80	38 81
Brittleness Temperature	D746	°C	-53	-53	-51	-51	-51	-47	-46	-46

Table 3: Medalist MD-12300 Series for Translucent Medical Tubing: Silicone Alternatives
Applications: Drainage (ex. Chest Drainage)

Typical Properties	ASTM Test Method	Units	MD-12337	MD-12342 *	MD-12352 *	MD-12362 *	MD-12368	MD-12372 *	MD-12382 *
Appearance	---	---	Translucent	Translucent	Translucent	Translucent	Translucent	Translucent	Translucent
Hardness (5s delay)	D2240	Shore A	37	42	52	62	72	72	82
Specific Gravity	D792	---	0.89	0.89	0.89	0.89	0.89	0.89	0.90
Melt Flow Rate (200°C/5.0 kg)	D1238	g/10 min	0.5	6	6	1	1	1.5	4.5
Tensile Stress (50% Strain)	D412	psi (MPa)	105 (0.72)	155 (1.07)	215 (1.48)	255 (1.76)	310 (2.14)	445 (3.07)	630 (4.34)
Tensile Stress (100% Strain)	D412	psi (MPa)	145 (1.00)	200 (1.38)	270 (1.86)	325 (2.24)	415 (2.86)	530 (3.65)	680 (4.69)
Tensile Stress (300% Strain)	D412	psi (MPa)	360 (2.48)	415 (2.86)	510 (3.52)	640 (4.41)	700 (4.83)	850 (5.86)	950 (6.55)
Tensile Strength (Break)	D412	psi (MPa)	1270 (8.76)	1900 (13.10)	1420 (9.79)	2220 (15.31)	2080 (14.34)	2450 (16.89)	2550 (17.58)
Tensile Elongation (Break)	D412	%	720	720	640	690	600	690	680
Tear Strength (Die C, 20 in/min)	D624	ibf/in (N/mm)	150 (26.27)	187 (32.75)	220 (38.53)	245 (42.91)	267 (46.76)	296 (51.84)	385 (67.42)
Compression Set 73°F, 22hr 158°F, 22hr	D395	% %	12 77	17 97	16 93	16 85	18 83	23 81	27 86
Brittleness Temperature	D746	°C	<-60	<-60	<-60	<-60	<-60	<-60	<-60

*Footnote: Product variants with different surface characteristics are offered. They may be suitable for applications involving drug, protein, body fluid or blood interactions.

The information and recommendations contained in this bulletin are, to the best of our knowledge, accurate and reliable but no guarantee of their accuracy is made. All products are sold upon condition that purchasers shall make their own tests to determine the suitability of such products for their particular purposes and uses and purchaser assumes all risks and liability for the results of use of the products, including use in accordance with seller's recommendations. Nothing in this bulletin constitutes permission or a recommendation to practice or use any invention covered by any patent owned by this company or by others. There is no warranty of merchantability and there are no other warranties for the products described. For detailed Product Stewardship information, please contact us. Any product of Teknor Apex, including product names, shall not be used or tested in any medical or food contact application without the prior written acknowledgment of Teknor Apex as to the intended use. Please note that some products may not be available in one or more countries.



AMERICAS
 505 Central Avenue
 Pawtucket, RI 02861
 401-725-8000
 800-556-3864

EUROPE
 Mijnweg 1
 6167AC Geleen
 Netherlands
 31(0) 46 7020950

ASIA
 41 Shipyard Road
 Singapore 628134
 (011) 65-6265-2544