

Thermoplastic
Polyurethane
Elastomers (TPU)

Elastollan[®] –
Product Range

Elastogran is
Polyurethanes

Elastogran



■ • **BASF** Group

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Quality Management

We are certified according to:
 ISO/TS 16949: 2002,
 DIN EN ISO 9001 : 2000
 DIN EN ISO 14001



Nomenclature for Elastollan

Elastollan 11 85 A 10 W 000

Elastollan	Grade	Hardness	Particle form	Lubricant	Additives	Additives
<p>Elastollan is the registered trademark of Elastogran thermoplastic Polyurethane Elastomers.</p> <p>The product code consists of a letter and a number combination.</p>	<p>The letter or number characterizes the basis polyol</p> <p>B, C, S, 5, 6, 8 = Polyester</p> <p>11 = Polyether 21 = Polyester-ether</p> <p>R = glass-fibre reinforced grades</p> <p>LP-Laboratory product still in development</p> <p>SP-Special product: Product modified to meet customer's requirement.</p>	<p>A = Shore A</p> <p>D = Shore D</p>	<p>1 = cylindrical or lentil shaped pellets</p> <p>5 = diced</p>	<p>0 = without lubricant</p> <p>3, 5 = with lubricant</p>	<p>A = antistatic</p> <p>ESD = electronic sensitive devices</p> <p>FHF = flame retardant halogen free</p> <p>HPM = hard phase modified</p> <p>M = matt surface</p> <p>SPF = soft plasticizer free</p> <p>U = UV stabilized</p> <p>W/WH = plasticized</p>	<p>000 = natural colour</p> <p>100 bis 999 = code for included additive</p>

Master-batches

Elastollan Konz and Elastollan Konz V are pigment and various additive master-batches. They can be used not only to colour, but also to improve processing and to improve stability against e.g. UV radiation, as blowing agent and for modification in various property areas.

Delivery form, Packing, Storage and Shelf-life

Delivery form

Diced, cylindrical or lentil shaped pellets.

Packing for all Elastollan grades excluding R grades

- Aluminium foil-lined PE bags, 25kg net
- Oktabins with PE liner bags, ca. 1 000kg net
- Big Bags, ca. 900kg net
- Tanker, ca. 20t net.

Packing for R grades

- Sealed drums with PE liner bags, 125kg net
- Oktabins with PE liner bags, ca. 1 000kg net
- Tanker, ca. 20t net.

Storage and shelf-life

Approximately six months from delivery date in original sealed containers with cool dry storage.

Elastollan 1100 grades

Thermoplastic Polyether Polyurethane Elastomers with outstanding hydrolysis resistance, low temperature flexibility and resistance to micro-organisms.

Physical properties	Units	DIN	ISO	Elastollan 1175 A W	1180 A	1185 A W	1185 A
Suitable for: injection moulding ▲ extrusion ■ blow moulding ●				▲■	▲■	▲■	▲■●
Hardness	Shore A	53505	868	75	80	83	87
Hardness	Shore D	53505	868				36
Density	g/cm ³	DIN EN ISO 1183-1-A		1,14	1,11	1,16	1,12
Tensile strength	MPa	53504	37	40	45	40	45
Elongation at break	%	53504	37	700	650	700	600
Stress at 20% elongation	MPa	53504	37	2	2	2,5	2,5
Stress at 100% elongation	MPa	53504	37	4	4,5	6	6
Stress at 300% elongation	MPa	53504	37	8	8	8	10
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527					
Tear strength	kN/m	DIN ISO 34-1/B/b		40	55	50	70
Abrasion loss	mm ³	53516	4649	45	30	40	25
Compression set at room temperature	%	DIN ISO	815	20	25	20	25
Compression set at 70°C	%	DIN ISO	815	40	45	35	45
Tensile strength after storage in water at 80°C for 42 days	MPa	53504	37	28	30	30	32
Elongation at break after storage in water at 80°C for 42 days	%	53504	37	750	700	700	600
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179		kB	kB	kB	kB
Notched impact strength (Charpy) -30°C		DIN EN ISO 179		kB	kB	kB	kB
Flammability rating		UL 94		V0/V2 ³⁾	HB	V2	HB

¹⁾ Flame retardant halogen free

²⁾ Extrusion quality for pneumatic tubing

³⁾ according to wall section

kB = no fracture

Typical applications

Cable sheathing, plugs and terminations, spiral tubing, films, ski-boot shells, ear tags, technical mouldings, e.g. mining screens, railway pads, seals.

Processability

Processable by injection moulding, extrusion and blow moulding

Process temperature (injection moulding): 170 to 240°C

Mould temperature: 20 to 70°C

Processing temperature (extrusion): 160 to 220°C.

1185 A M	1185 A WM	1185 A FHF ¹⁾	1190 A	1195 A	1198 A ²⁾	1154 D	1154 D FHF ¹⁾	1160 D	1164 D	1174 D
■	■	▲■	▲■	▲■	▲■	▲■	▲■	▲■	▲■	▲■
88	87	89	92	96						
39	39	37	42	48	52	53	58	60	64	73
1,11	1,15	1,23	1,14	1,15	1,16	1,17	1,27	1,18	1,18	1,20
45	35	35	50	55	50	50	30	50	50	50
600	600	600	550	500	450	450	400	400	350	300
3,5	4	3,5	4,5	6	9	11	13	13	16	25
7	7	8	8,5	10	15	17	19	19	25	30
12	13	13	16	18	28	38	33	41	45	45
						150	160	200	250	560
60	55	60	85	100	125	150	110	170	190	220
60	38	35	25	25	25	20	30	20	20	20
35	20	25	25	30	35	40	30	40	40	50
45	35	45	45	45	50	50	45	50	50	55
30	30	20	35	37	35	35	20	35	35	35
650	600	600	600	500	450	450	400	450	400	400
kB	kB	kB	kB	kB	kB	kB	50	kB	kB	kB
kB	kB	120	kB	kB	190	18	3	16	12	5
		V0		HB			V0/V2 ³⁾			

Please note

The stated values for individual grades are typical test results and not limiting specification values.

Quoted results are from measurements on injection moulded test platens, post tempered for 20 hours at 100°C.

Specialist application areas

Please contact our technical department for advice on acceptability and approvals for use in areas such as potable water and foodstuff contact and medical applications.

Elastollan C grades

Thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties and chemical resistance, outstanding wear resistance, high tear and tensile strength, good damping characteristics and a high resilience performance.

Physical properties	Unit	DIN	ISO	Elastollan				
				C 65 A HPM	C 70 A HPM	C 75 A HPM	C 85 A HPM	C 78 A
Suitable for: injection moulding ▲ extrusion ■ blow moulding ●				▲■●	▲■●	▲■●	▲■	▲■
Hardness	Shore A	53505	868	65	70	75	85	80
Hardness	Shore D	53505	868					
Density	g/cm ³	DIN EN ISO 1183-1-A		1,19	1,17	1,20	1,23	1,18
Tensile strength	MPa	53504	37	40	45	50	50	50
Elongation at break	%	53504	37	800	750	700	650	650
Stress at 20% elongation	MPa	53504	37	1,5	1,5	2	3,5	2
Stress at 100% elongation	MPa	53504	37	2,0	2,5	3,5	6,0	4
Stress at 300% elongation	MPa	53504	37	4,0	4,5	6	11	7,5
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527						
Tear strength	kN/m	DIN ISO 34-1/B/b		40	40	45	70	60
Abrasion loss	mm ³	53516	4649	40	35	35	40	30
Compression set at room temperature	%	DIN ISO	815	20	15	15	15	25
Compression set at 70°C	%	DIN ISO	815	30	25	25	25	35
Tensile strength after storage in water at 80°C for 21 days	MPa	53504	37	25	30	35	35	35
Elongation at break after storage in water at 80°C for 21 days	%	53504	37	900	850	800	800	650
Notched impact strength (Charpy)+23°C	kJ/m ²	DIN EN ISO 179		kB	kB	kB	kB	kB
Notched impact strength (Charpy)- 30°C	kJ/m ²	DIN EN ISO 179		kB	kB	kB	kB	kB
Flammability rating		UL 94						

¹⁾ Extrusion quality for round belt

²⁾ Extrusion quality for pneumatic tubing

kB = no fracture

Characteristic properties

Spiral tubing, pneumatic tubing, round and v-belted, technical mouldings, e.g. bushes, dust caps, seals, blow moulded bellows, mining screens.

Processability

Processable by injection moulding, extrusion and blow moulding.

Process temperature (injection moulding): 170 to 240°C

Mould temperature: 20 to 70°C

Process temperature (extrusion): 150 to 230°C.

C 80 A	C 85 A	C 88 A ¹⁾	C 90 A	C 95 A	C 98 A ²⁾	C 59 D	C 60 D	C 64 D	C 74 D
▲■	▲■●	■	▲■●	▲■	■	▲	▲	▲	▲
82	87	88	93	96					
	36	37	41	47	52	57	60	63	73
1,19	1,19	1,19	1,20	1,21	1,22	1,23	1,23	1,24	1,25
50	50	50	55	55	50	50	50	45	45
650	650	600	550	550	550	500	450	400	350
2,5	3	3,5	7	8	11	12	16	17	28
4,5	5,5	6	9	11	14	17	20	24	30
8,5	9,5	13	15	22	26	30	35	35	35
					160	250	330	390	730
65	70	75	95	120	130	160	180	200	240
30	30	30	25	25	30	20	20	20	20
25	25	25	25	30	30	30	40	40	40
35	35	40	40	45	50	50	50	55	60
35	38	38	40	40	40	43	43	43	45
650	650	650	550	500	550	480	450	420	380
kB kB	kB kB	kB kB	kB kB	kB kB	kB 25	kB 12	kB 8	kB 7	120 4
	HB				HB	HB			HB

Please note

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Quoted results are from measurements on injection moulded test platens, post tempered for 20 hours at 100°C.

Specialist application areas

Please contact our technical department for advice on acceptability and approvals for use in areas such as potable water and foodstuff contact and medical applications.

Elastollan B grades

Thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties, outstanding wear resistance, high tensile strength, good damping and resilience performance and superior low temperature flexibility.

Physical properties	Unit	DIN	ISO	Elastollan			
				B 60 A WHA ¹⁾	B 60 A ESD ¹⁾	B 80 A	B 85 A
Suitable for: Injection moulding ▲ extrusion ■				▲	▲	▲	▲■
Hardness	Shore A	53505	868	60	65	82	83
Hardness	Shore D	53505	868				
Density	g/cm ³	DIN EN ISO 1183-1-A		1,17	1,17	1,19	1,20
Tensile strength	MPa	53504	37	35	20	50	55
Elongation at break	%	53504	37	900	800	600	600
Stress at 20% elongation	MPa	53504	37	1	1	2	2
Stress at 100% elongation	MPa	53504	37	2,5	2,5	5	4
Stress at 300% elongation	MPa	53504	37	6,5	6,5	14,5	15
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527					
Tear strength	kN/m	DIN ISO 34-1/B/b		50	40	85	75
Abrasion loss	mm ³	53516	4649	40	120	35	35
Compression set at room temperature	%	DIN ISO	815	20	20	20	25
Compression set at 70°C	%	DIN ISO	815	30	30	30	35
Tensile strength after storage in water at 80°C for 21 days	MPa	53504	37	20	20	40	40
Elongation at break after storage in water at 80°C for 21 days	%	53504	37	1000	900	600	600
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179		kB	kB	kB	kB
Notched impact strength (Charpy) -30°C		DIN EN ISO 179		kB	kB	kB	kB

Selected types in the B range are available on request, with included UV stabilisation.

1) for safety shoes, volume resistivity (IEC 60093):
 B 60 A WHA = 10⁹ Ohm x cm
 B 60 A ESD = 10⁷ Ohm x cm

kB = no break

Typical applications

Sport-shoe soles and accessories, ski-boot shells, technical mouldings, e.g. seals, castor tyres, tubing.

Processing

Processable by injection moulding and extrusion.

Process temperature (injection moulding): 175 to 230°C

Mould temperature: 20 to 70°C

Process temperature (extrusion): 175 to 230°C.

B 90 A	B 95 A	B 98 A	B 60 D	B 64 D					
▲■	▲■	▲■	▲■	▲					
91	96								
42	48	50	60	64					
1,21	1,22	1,22	1,23	1,24					
55	55	55	55	55					
550	550	500	500	450					
4	7	8	13	17					
7	10	12	16	19					
20	22	30	30	35					
		140	240	320					
90	100	130	150	180					
30	30	25	25	25					
25	30	35	35	35					
40	40	45	45	50					
40	40	40	40	40					
550	500	500	450	400					
kB	kB	kB	kB	kB					
kB	200	18	10	8					

Please note

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Specialist application areas

Please contact our technical department for advice on acceptability and approvals for use in areas such as potable water and foodstuff contact and medical applications.

Elastollan 600 grades

Transparent, thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties and wear resistance, good damping characteristics and a high resilience performance

Physical properties	Unit	DIN	ISO	Elastollan 670 AWHU	685 AU	690 AU	695 AU
Suitable for: Injection moulding ▲ extrusion ■				▲	▲■	▲■	▲■
Hardness	Shore A	53505	868	70	86	90	
Hardness	Shore D	53505	868				50
Density	g/cm ³	DIN EN ISO 1183-1-A		1,19	1,21	1,21	1,22
Tensile strength	MPa	53504	37	35	50	50	50
Elongation at break	%	53504	37	650	600	550	500
Stress at 20 % elongation	MPa	53504	37	1	2,8	4	6
Stress at 100 % elongation	MPa	53504	37	3	5,5	7	10
Tear strength	kN/m	DIN ISO 34-1/B/b		40	75	85	100
Abrasion loss	mm ³	53516	4649	40	40	40	40
Compression set at room temperature	%	DIN ISO	815	25	25	25	25
Compression set at 70 °C	%	DIN ISO	815	40	45	45	40
Tensile strength after storage in water at 80 °C for 21 days	MPa	53504	37	30	40	40	40
Elongation at break after storage in water at 80 °C for 21 days	%	53504	37	700	650	600	550
Notched impact strength +23°C	kJ/m ²	DIN EN ISO 179		kB	kB	kB	kB
Notched impact strength -30°C	kJ/m ²	DIN EN ISO 179		kB	kB	kB	200

Materials in the 600 series are available with omission of the standard UV stabilisation.

kB = no break

Typical applications

Decorative parts and damping elements for the sport-shoe industry, ski tips, tubes and films.

Processing

Processable by injection moulding and extrusion

Process temperature injection moulding: 175 to 230°C

Mould temperature: 20 to 70°C

Process temperature extrusion: 175 to 220°C.

660 DU ▲	664 DU ▲								
60	65								
1,23	1,23								
50	40								
400	350								
8	12								
14	20								
120	130								
40	30								
30	35								
40	40								
40	40								
450	400								
kB 7	kB 9								

Please note

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Quoted results are from measurements on injection moulded test platens, post tempered for 20 hours at 100°C.

Specialist application areas

Please contact our technical department for advice on acceptability and approvals for use in areas such as potable water and foodstuff contact and medical applications.

Elastollan S grades

Thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties and wear resistance, good damping characteristics and a high resilience performance.

Physical properties	Unit	DIN	ISO	Elastollan S 50 A SPF	S 60 A SPF	S 70 A SPF	S 60 AWH ¹⁾
Suitable for: Injection moulding ▲ extrusion ■ blow moulding ●				▲■	▲■	▲■	▲■
Hardness	Shore A	53505	868	55	60	70	60
Hardness	Shore D	53505	868				
Density	g/cm ³	DIN EN ISO 1183-1-A		1,2	1,2	1,2	1.19
Tensile strength	MPa	53504	37	35	40	40	30
Elongation at break	%	53504	37	900	850	750	800
Stress at 20% elongation	MPa	53504	37	0,8	1	1,4	1
Stress at 100% elongation	MPa	53504	37	1,1	2,4	3,3	2,5
Stress at 300% elongation	MPa	53504	37	3,3	4,2	5,9	5
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527					
Tear strength	kN/m	DIN ISO 34-1/B/b		40	50	60	35
Arasion loss	mm ³	53516	4649	35	30	30	50
Compression set at room temperature	%	DIN ISO	815	30	25	25	20
Compression set at 70°C	%	DIN ISO	815	45	40	35	35
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO	179	kB	kB	kB	kB
Notched impact strength (Charpy) - 30°C	kJ/m ²	DIN EN ISO	179	kB	kB	kB	kB
Flammability rating		UL 94					

1) for Combi-sole

kB = no break

Typical applications

Shoe-soles, top pieces, tubes, technical parts e.g. castor tyres.

Processing

Processable by injection moulding and extrusion

Process temperature (injection moulding): 175 to 240°C

Mould temperature: 20 to 70°C

Process temperature (extrusion): 175 to 220°C.

S 70 AWH ¹⁾	S 80 A	S 85 A	S 90 A	S 95 A	S 98 A	S 60 D	S 64 D	S 74 D		
▲■	▲■	▲■●	▲■●	▲	▲■	▲	▲	▲		
68	81	85	93	96						
			41	48	55	60	64	75		
1,20	1,22	1,23	1,24	1,24	1,25	1,25	1,26	1,26		
30	50	55	55	50	45	45	45	40		
850	750	650	600	550	500	500	450	300		
1,2	2	2	6	8	13	15	22	25		
2,9	4	5	9	11	16	18	23	30		
5,3	8	8	13	20	23	34	38	40		
					200	250	410	800		
50	60	70	95	120	150	170	200	240		
65	40	35	30	30	25	25	25	25		
20	25	25	25	25	30	40	45	55		
35	35	35	45	45	45	50	55	60		
kB	kB	kB	kB	kB	kB	kB	140	170		
kB	kB	kB	kB	14	13	4	4	3		
		HB								

Please note

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Specialist application areas

Please contact our technical department for advice on acceptability and approvals for use in areas such as potable water and foodstuff contact and medical applications.

Elastollan R grades

Glass Fibre Reinforced Thermoplastic Polyester Polyurethane Elastomers with exceptional properties, very high impact resistance, high modulus with at the same time elasticity, low coefficient of thermal expansion comparable with steel and aluminium, low mould shrinkage and ease of painting.

Physical properties	Unit	DIN	ISO	Elastollan R 1001	R 1000	R 2000	R 3000
Suitable for: Injection moulding ▲				▲	▲	▲	▲
Modul of elasticity – tensile test	MPa	DIN EN ISO 527		350	1000	2000	2800
Density	g/cm ³	DIN EN ISO 1183-1-A		1,27	1,36	1,37	1,38
Hardness	Shore D	53505	868	50	60	67	73
Glass-fibre content	%			10	20	20	20
Tensile strength (test specimen type 1A) strain rate 50 mm/min	MPa	DIN EN ISO 527		30	50	65	80
Elongation at break (test specimen type 1A) strain rate 50 mm/min	%	DIN EN ISO 527		65	40	25	10
Impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179		kB*	kB*	140	120
Impact strength (Charpy) - 30°C	kJ/m ²	DIN EN ISO 179		160	130	110	70
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179		70	70	50	30
Notched impact strength (Charpy) - 30°C	kJ/m ²	DIN EN ISO 179		30	20	10	10
Deflection temperature	°C	DIN EN ISO 75-2/Ae		65	90	115	120
Deflection temperature	°C	DIN EN ISO 75-2/Be		125	120	138	155
Coefficient of linear expansion between 23°C and 80°C	10 ⁻⁶ · K ⁻¹	53752-A		28	20	20	20
Colour				natural	natural	natural	natural
Flammability rating		UL 94					HB

¹⁾ Paintable with water-based lacquers

Typical applications

Automotive body and rocker panels, underbody sealants, technical mouldings e.g. plugs, ski tips.

Processing

Processable by injection moulding
Process temperature: 225 to 245°C
Mould temperature: 50 to 70°C.

R 2001	R 2005/1	R 2006 ¹⁾	R 2002	R 3001					
▲	▲	▲	▲	▲					
1800	1900	2000	2300	3000					
1,37	1,35	1,35	1,38	1,32					
67	64	64	70	75					
20	20	20	25	15					
60	65	65	70	65					
30	20	20	15	25					
180 110	140 100	130 80	130 90	100 70					
50 10	50 10	40 10	40 10	30 6					
120 150	120 150	120 150	130 170	110 155					
22	20	20	15	30					
black	black	black	black	black					

Please note

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Specialist application areas

Please contact our technical department for advice on acceptability and approvals for use in areas such as potable water and foodstuff contact and medical applications.

Elastollan/Elastoblend

Thermoplastic Polyurethane Elastomer Special Products with excellent mechanical properties, outstanding wear resistance, high tear and tensile strength, good damping characteristics and a high resilience performance.

Physical properties	Unit	DIN	ISO	Elastoblend LP 9192 Polyether based for matt surfaces ▲▲	Elastollan 1085 A Alternative Polyether basis ▲	SP 806 Polyether based for opaque films ■	SP 883 Polyester based for opaque films ■
Suitable for: injection moulding ▲							
	extrusion ■						
Hardness	Shore A	53505	868	75	89	87	85
Hardness	Shore D	53505	868				
Density	g/cm ³	DIN EN ISO 1183-1-A		1,11	1,15	1,12	1.19
Tensile strength	MPa	53504	37	20	35	45	40
Elongation at break	%	53504	37	750	700	550	550
Stress at 20% elongation	MPa	53504	37	0,8	4,8	2,5	2
Stress at 100% elongation	MPa	53504	37	2,7	7,3	6	5
Stress at 300% elongation	MPa	53504	37	7,7	16,5	11,5	10,5
Tear strength	kN/mm	DIN ISO 34-1/B/b		35	60	60	60
Abrasion loss	mm ³	53516	4649	100	70	30	40
Compression set at room temperature	%	DIN EN ISO	815	27	22	26	22
Compression set at 70°C	%	DIN EN ISO	815	53	34	43	37
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO	179	kB	kB	kB	kB
Notched impact strength (Charpy) -30°C	kJ/m ²	DIN EN ISO	179	kB	kB	kB	kB

kB = no break

Typical application

Application specific formulations.

Processing

Processable by injection moulding and extrusion

Process temperature (injection moulding): 175 to 240°C

Mould temperature: 20 to 70°C

Process temperature (extrusion): 175 to 220°C.

880 AN Polyester based for transparent films ■	890 AN Polyester based for transparent films ■	2180 A Polyester/ Polyether based for fibres/films ■	SP 9213 Polyether based easy flow ▲■	SP 852 Polyester based easy flow ▲■	1154 D KFFC Polyether based for flexible flat cables ■				
78	94	77	80	81					
					62				
1,21	1,22	1,13	1,11	1,23	1,23				
40	50	45	26	50	40				
650	550	450	700	680	400				
2,8	5,7	1	2,5	2,3	16,5				
5,5	10	4,5	5,5	5	22				
9,5	22,5	10	9	8,5	31,5				
60	120	40	40	70	150				
45	45	45	70	30	30				
23	32	14	22	23	30				
58	43	23	45	42	45				
kB kB	kB 200	kB kB	kB kB	kB kB	90 5				

Please note

The stated values for individual grades are typical test results and not limiting specification values.

Quoted results are from measurements on injection moulded test platens, post tempered for 20 hours at 100°C.

Specialist application areas

Please contact our technical department for advice on acceptability and approvals for use in areas such as potable water and foodstuff contact and medical applications.

Elastogran is Polyurethane

With top quality products, a reputation for good customer service and continuous progress and development, Elastollan has secured a firm position in numerous markets.

We want to share our know-how and experience to contribute to your own success: The versatile Elastollan is the ideal material to fulfill your requirements.

For further information, the following detailed brochures are available upon request:

- Thermoplastic Polyurethane Elastomers: Elastollan
- Elastollan – Material Properties
- Elastollan – Processing Recommendations
- Elastollan – Electrical Properties
- Elastollan – Chemical Resistance

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