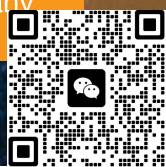


Thermoplastic Polyurethane Elastomers (TPU)

Elastollan® –
Product Range

 **BASF**

The Chemical Company



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Quality Manage- ment

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



Edition: August 2013

Nomenclature
for Elastollan

Elastollan 11 85 A 10 W 000

Elastollan	Grade	Hardness	Particle form	Lubricant	Additives	Additives
Elastollan is the registered trademark of BASF Polyurethanes GmbH for thermoplastic Polyurethane Elastomers. The product code consists of a letter and a number combination. Elastollan A and L stand for aliphatic thermoplastic Polyurethanes	The letter or number characterizes the basis polyol B, C, S, 5, 6, 7, 8 = Polyester 10, 11, 12 = Polyether R = glas-fibre reinforced grades LP-Laboratory product still in development SP-Special product, modified to meet customer's requirement N- based on renewable raw materials	A = Shore A D = Shore D	1 = cylindrical or lentil shaped pellets 5 = diced	0 = without lubricant 3, 5 = with lubricant	ESD = electronic sensitive devices FHF = flame retardant halogen free HPM = high performance material M = matt surface N = not stabilized U = UV stabilized P/W/WH = contains plasticiser T = approved for drinking water applications	000 = natural colour 100 bis 999 = code for included additive

Master-batches

Elastollan Konz and Elastollan Konz V are pigments 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.

Elastollan X-Flex are additives with crosslinking properties.

Delivery form,
Packing, Storage
and Shelf-life

Delivery form

Diced, Lentil or cylindrical shaped pellets.

Packing for all Elastollan grades
excluding R grades

- Multi Layer PE bag, 25kg net
- Oktabins with PE liner bags, ca. 1000kg 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. 1000kg 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	Test method	Elastollan 1170 A	1175 A W	1180 A	1185 A W	1185 A	1185 A M
Hardness	Shore A	DIN ISO 7619-1 (3s)	71	75	80	83	87	88
Hardness	Shore D	DIN ISO 7619-1 (3s)					36	39
Density	g/cm ³	DIN EN ISO 1183-1-A	1,08	1,14	1,11	1,16	1,12	1,11
Tensile strength	MPa	DIN 53504-S2	30	40	45	40	45	45
Elongation at break	%	DIN 53504-S2	850	700	650	700	600	600
Stress at 20% elongation	MPa	DIN 53504-S2	1,3	2	2	2,5	2,5	3,5
Stress at 100% elongation	MPa	DIN 53504-S2	2	4	4,5	6	6	7
Stress at 300% elongation	MPa	DIN 53504-S2	4,8	8	8	8	10	12
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527						
Tear strength	kN/m	DIN ISO 34-1Bb	44	40	55	50	70	60
Abrasion loss	mm ³	DIN ISO 4649-A	<50	45	30	40	25	60
Compression set at room temperature, 72h	%	DIN ISO 815	24	20	25	20	25	35
Compression set at 70°C, 24h	%	DIN ISO 815	50	40	45	35	45	45
Tensile strength after storage in water at 80°C for 42 days	MPa	DIN 53504-S2		28	30	30	32	30
Elongation at break after storage in water at 80°C for 42 days	%	DIN 53504-S2		750	700	700	600	650
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179-1	kB	kB	kB	kB	kB	kB
Notched impact strength (Charpy) -30°C	kJ/m ²	DIN EN ISO 179-1	kB	kB	kB	kB	kB	kB
Fire behaviour		UL 94		V0/V2 ²⁾	HB	V2	HB	

¹⁾ Extrusion quality for pneumatic tubing

²⁾ according to wall section

kB = no fracture

Certain 1100 grades are available in uv-stabilized versions.

Typical applications

Cable jackets, plugs and terminations, spiral tubing, Films, ski-boot shells, ear tags, technical mouldings like mining screens, railway pads, seals.

Processability

Processable by injection moulding, extrusion and blow moulding

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

Mould temperature: 20 to 70 °C

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



1185 A WM	1190 A	1195 A	1198 A ¹⁾	1154 D	1160 D	1164 D	1174 D				
87	92	96									
39	42	48	52	53	60	64	73				
1,13	1,14	1,15	1,16	1,17	1,18	1,18	1,20				
30	50	55	50	50	50	50	50				
650	550	500	450	450	400	350	300				
4	4,5	6	9	11	13	16	25				
7	8,5	10	15	17	19	25	30				
10	16	18	28	38	41	45	45				
				150	200	250	560				
55	85	100	125	150	170	190	220				
65	25	25	25	20	20	20	20				
25	25	30	35	40	40	40	50				
43	45	45	50	50	50	50	55				
30	35	37	35	35	35	35	35				
600	600	500	450	450	450	400	400				
kB kB	kB kB	kB kB	kB 190	kB 18	kB 16	kB 12	kB 5				
		HB									

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 20h at 100 °C.

Specialist application areas

Please contact our technical department for further regulatory information and approvals in the case of food contact, drinking water or medical applications.



Highly transparent thermoplastic with good hydrolysis resistance, low temperature flexibility and resistance to micro-organisms

 $kB = \text{no fracture}$

Ski boot shells, ski components,
Films.

Processable by injection moulding as well as by extrusion

Process temperature (injection moulding): 215 to 240 °C

Mould temperature: 20 to 70°C

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



1278 D U										
77										
1,2										
50										
350										
29										
33										
43										
808										
220										
40										
10										

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 20h at 100 °C.

Specialist application areas

Please contact our technical department for further regulatory information and approvals in the case of food contact, drinking water or medical applications.



Elastollan C grades

Thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties. Outstanding tensile strength and high elongation at break, good damping characteristics, a high resilience performance and very good wear resistance.

Physical Properties	Units	Test method	Elastollan C 60 AP	C 78 A	C 80 A	C 85 A	C 88 A ¹⁾
Hardness	Shore A	DIN ISO 7619-1 (3s)	60	80	82	87	88
Hardness	Shore D	DIN ISO 7619-1 (3s)				36	37
Density	g/cm ³	DIN EN ISO 1183-1-A	1,15	1,18	1,19	1,19	1,19
Tensile strength	MPa	DIN 53504-S2	38	50	50	50	50
Elongation at break	%	DIN 53504-S2	1000	650	650	650	600
Stress at 20% elongation	MPa	DIN 53504-S2	1	2	2,5	3	3,5
Stress at 100% elongation	MPa	DIN 53504-S2	2,4	4	4,5	5,5	6
Stress at 300% elongation	MPa	DIN 53504-S2	5	7,5	8,5	9,5	13
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527					
Tear strength	kN/m	DIN ISO 34-1Bb	40	60	65	70	75
Abrasion loss	mm ³	DIN ISO 4649-A	50	30	30	30	30
Compression set at room temperature, 72h	%	DIN ISO 815	21	25	25	25	25
Compression set at 70°C, 24h	%	DIN ISO 815	37	35	35	35	40
Tensile strength after storage in water for 21 days at 80°C	MPa	DIN 53504-S2		35	35	38	38
Elongation at break after storage in water for 21 days at 80°C	%	DIN 53504-S2		650	650	650	650
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179-1		kB	kB	kB	kB
Notched impact strength (Charpy) - 30°C	kJ/m ²	DIN EN ISO 179-1		kB	kB	kB	kB
Fire behaviour		UL 94				HB	

¹⁾ Extrusion quality for round belts

²⁾ Extrusion quality for pneumatic tubing

kB = no fracture

Typical applications

Spiral tubing, pneumatic tubing, round belting, technical mouldings e.g. bushes, dust caps, seals, joints, blow moulded bellows, fan belts.

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 90 A	C 95 A	C 98 A ²⁾	C 59 D	C 60 D	C 64 D	C 74 D			
93	96								
41	47	52	57	60	63	73			
1,20	1,21	1,22	1,23	1,23	1,24	1,25			
55	55	50	50	50	45	45			
550	550	550	500	450	400	350			
7	8	11	12	16	17	28			
9	11	14	17	20	24	30			
15	22	26	30	35	35	35			
		160	250	330	390	730			
95	120	130	160	180	200	240			
25	25	30	20	20	20	20			
25	30	30	30	40	40	40			
40	45	50	50	50	55	60			
40	40	40	43	43	43	45			
550	500	550	480	450	420	380			
kB kB	kB kB	kB 25	kB 12	kB 8	kB 7	120 4			
	HB	HB	HB			HB			

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 20h at 100 °C.

Specialist application areas

Please contact our technical department for further regulatory information and approvals in the case of food contact, drinking water or medical applications.



Elastollan HPM grades

Thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties, very good damping and resilience performance, heat resistance and improved cycle times.

Physical Properties	Units	Test method	Elastollan C 60 A HPM	C 65 A HPM	C 70 A HPM	C 75 A HPM
Hardness	Shore A	DIN ISO 7619-1 (3s)	63	67	71	75
Hardness	Shore D	DIN ISO 7619-1 (3s)				
Density	g/cm³	DIN EN ISO 1183-1-A	1,17	1,18	1,18	1,18
Tensile strength	MPa	DIN 53504-S2	35	37	40	40
Elongation at break	%	DIN 53504-S2	1000	950	900	900
Stress at 20% elongation	MPa	DIN 53504-S2	0,85	1,5	1,5	2
Stress at 100% elongation	MPa	DIN 53504-S2	1,5	2,0	2,5	3,5
Stress at 300% elongation	MPa	DIN 53504-S2	2	4,0	4,5	6
Tear strength	kN/m	DIN ISO 34-1Bb	40	44	45	50
Abrasion loss	mm³	DIN ISO 4649-A	55	55	50	50
Compression set at room temperature, 72h	%	DIN ISO 815	25	25	25	25
Compression set at 70 °C, 24h	%	DIN ISO 815	43	37	35	35
Compression set at 100 °C, 24h	%	DIN ISO 815	60	55	50	50
Tensile strength after storage in water for 21 days at 80 °C	MPa	DIN 53504-S2	20	25	30	35
Elongation at break after storage in water for 21 days at 80 °C	%	DIN 53504-S2	1100	900	850	800
Notched impact strength (Charpy) +23 °C	kJ/m²	DIN EN ISO 179-1	kB	kB	kB	kB
Notched impact strength (Charpy) - 30 °C	kJ/m²	DIN EN ISO 179-1	kB	kB	kB	kB
Vicat-softening temperature A 120 °C/h	°C	DIN EN ISO 306	70	80	90	100

kB = no fracture

Typical applications

(Automotive)
e.g. sealings, stop dampers,
cable jackets.

Processability

Processable by injection moulding,
extrusion and blow moulding

Process temperature (injection
moulding): 190 to 220 °C

Mould temperature: 20 to 50 °C

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



C 85 A HPM	785 A HPM	754 D HPM						
85	85							
		55						
1,20	1,18	1,24						
45	45	35						
750	700	450						
3,5	3,5	15						
6,0	6	20						
11	11	40						
70	70	160						
40	40	20						
20	20	25						
30	30	35						
45	45	45						
35	40	30						
800	750	550						
kB	kB	n. b.						
kB	kB	n. b.						
120	120	155						

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 20h at 100 °C.

Specialist application areas

Please contact our technical department for further regulatory information and approvals in the case of food contact, drinking water or medical applications.



Elastollan B grades

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

Physical Properties	Units	Test method	Elastollan B 60 AWH TSG	B 60 A ESD ^{1),2)}	B 60 A ESD M ¹⁾	B 80 A
Hardness	Shore A	DIN ISO 7619-1 (3s)	60	63	63	82
Hardness	Shore D	DIN ISO 7619-1 (3s)				
Density	g/cm ³	DIN EN ISO 1183-1-A	1,18	1,17	1,17	1,19
Tensile strength	MPa	DIN 53504-S2	25	30	30	50
Elongation at break	%	DIN 53504-S2	800	800	800	600
Stress at 20% elongation	MPa	DIN 53504-S2	1	1	1	2
Stress at 100% elongation	MPa	DIN 53504-S2	2,5	2,5	2,5	5
Stress at 300% elongation	MPa	DIN 53504-S2	6,5	6,5	6,5	14,5
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527				
Tear strength	kN/m	DIN ISO 34-1Bb	40	50	50	85
Abrasion loss	mm ³	DIN ISO 4649-A	100	60	60	35
Compression set at room temperature, 72h	%	DIN ISO 815	25	20	20	20
Compression set at 70°C, 24h	%	DIN ISO 815	40	30	30	30
Tensile strength after storage in water at 80°C for 21 days	MPa	DIN 53504-S2		25	25	40
Elongation at break after storage in water at 80°C for 21 days	%	DIN 53504-S2		900	900	600
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179-1	kB	kB	kB	kB
Notched impact strength (Charpy) - 30°C	kJ/m ²	DIN EN ISO 179-1	kB	kB	kB	kB
Specific volume resistivity	Ohm x cm	IEC60093		5x10 ⁷	5x10 ⁷	

Certain UV stabilised B grades are available on request

1) for safety shoes

2) transparent

Typical applications

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

Processability

Processable by injection moulding, extrusion and blow moulding

Process temperature (injection moulding): 190 to 220 °C

Mould temperature: 20 to 50 °C

Process temperature (extrusion): 180 to 230 °C.



B 85 A	B 90 A	B 95 A	B 98 A	B 60 D	B 64 D				
83	91	96							
	42	48	50	60	64				
1,20	1,21	1,22	1,22	1,23	1,24				
55	55	55	55	55	55				
600	550	550	500	500	450				
2	4	7	8	13	17				
4	7	10	12	16	19				
15	20	22	30	30	35				
			140	240	320				
75	90	100	130	150	180				
35	30	30	25	25	25				
25	25	30	35	35	35				
35	40	40	45	45	50				
40	40	40	40	40	40				
600	550	500	500	450	400				
kB kB	kB kB	kB 200	kB 18	kB 10	kB 8				

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 20h at 100 °C.

Specialist application areas

Please contact our technical department for further regulatory information and approvals in the case of food contact, drinking water or medical applications.



Transparent, Thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties, outstanding wear resistance, good damping and resilience performance.

Materials in the 600 series are available with UV stabilisation

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



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Elastollan S grades

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

Physical Properties	Units	Test method	Elastollan S 60 AP	S 70 A	S 80 A	S 85 A
Hardness	Shore A	DIN ISO 7619-1 (3s)	63	70	81	85
Hardness	Shore D	DIN ISO 7619-1 (3s)				
Density	g/cm ³	DIN EN ISO 1183-1-A	1,19	1,22	1,22	1,23
Tensile strength	MPa	DIN 53504-S2	35	34	50	55
Elongation at break	%	DIN 53504-S2	750	720	750	650
Stress at 20% elongation	MPa	DIN 53504-S2	1	1	2	2
Stress at 100% elongation	MPa	DIN 53504-S2	3	3	4	5
Stress at 300% elongation	MPa	DIN 53504-S2	6,5	5	8	8
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527				
Tear strength	kN/m	DIN ISO 34-1Bb	45	55	60	70
Abrasion loss	mm ³	DIN ISO 4649-A	35	42	40	35
Compression set at room temperature, 72h	%	DIN ISO 815			25	25
Compression set at 70 °C, 24h	%	DIN ISO 815			35	35
Notched impact strength (Charpy) +23°C	kJ/m ²	DIN EN ISO 179-1			kB	kB
Notched impact strength (Charpy) - 30°C	kJ/m ²	DIN EN ISO 179-1			kB	kB
Fire behaviour		UL 94				

kB = no fracture

Typical applications

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

Processability

Processable by injection moulding, extrusion and blow moulding

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

Mould temperature: 20 to 70 °C

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



Thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties and in particular, good abrasion resistance.

[illegible]

Typical applications

Shoes, parts subject to regular wear and tear, castor tyres and films.

Processability

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.



Aliphatic, thermoplastic Polyurethane with excellent colour fastness, good flow characteristics, detailed reproduction of surface structures, resistance to hydrolysis and low fogging values.



Glass fibre reinforced thermoplastic Polyester Polyurethane Elastomers with excellent mechanical properties, outstanding impact strength, high stiffness whilst maintaining good elongation, low coefficient of expansion similar to Aluminium, low shrinkage, good paintability.



Elastollan/flame retardant grades

Thermoplastic Polyether Polyurethane special products,
halogenfree flame retardant.

Physical Properties	Units	Test method	Elastollan 1177 A FHF	1185 A FHF	1190 A FHF	1191 A FHF
Hardness	Shore A	DIN ISO 7619-1 (3s)	77	89	90	91
Hardness	Shore D	DIN ISO 7619-1 (3s)		37		
Density	g/cm ³	DIN EN ISO 1183-1-A	1,2	1,23	1,25	1,26
Tensile strength	MPa	DIN 53504-S2	22	35	25	24
Elongation at break	%	DIN 53504-S2	800	600	550	550
Stress at 20% elongation	MPa	DIN 53504-S2	2	3,5	4,8	4,8
Stress at 100% elongation	MPa	DIN 53504-S2	3	8	8,4	8,5
Stress at 300% elongation	MPa	DIN 53504-S2	5	13	10,5	11,6
Modulus of elasticity – tensile test	MPa	DIN EN ISO 527				
Tear resitance	kN/m	DIN ISO 34-1Bb	53	60	60	60
Abrasion loss	mm ³	DIN ISO 4649-A	75	35	30	40
Compression set at room temperature, 72h	%	DIN EN ISO 815		25	26	24
Compression set at 70°C, 24h	%	DIN EN ISO 815		45	43	43
Notched impact strength (Charpy) +23°C	kJ/m ² kJ/m ²	DIN EN ISO 179-1		kB	kB	
Notched impact strength (Charpy) -30°C		DIN EN ISO 179-1		120	46	
Tensile strength after storage in water at 80 °C for 42 days	MPa	DIN 53504-S2		20	15	
Elongation at break after storage in water at 80 °C for 42 days	%	DIN 53504-S2		600	640	
Fire behaviour		UL 94		V0	V0	

¹⁾ according to wall section

Typical applications

Cable jackets, Films

Processability

Processable by extrusion

Process temperature: 175 to 220 °C.



1147 D FHF	1154 D FHF	1185 A HFFR							
94		86							
48	58								
1,29	1,27	1,42							
13	30	20							
400	400	580							
7	13	3,6							
9	19	6							
10	33	7,8							
	160								
60	110	55							
60	30								
38	30								
50	45								
kB 21	50 3								
7	20	12							
270	400	750							
	V0/V2 ¹⁾								

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 20h at 100 °C.

Specialist application areas

Please contact our technical department for further regulatory information and approvals in the case of food contact, drinking water or medical applications.



Thermoplastic Polyether and Polyester Polyurethane Special products with excellent mechanical properties, outstanding wear resistance, good damping and resilience performance and excellent tear strength.

1) Suitable for foaming

Typical applications

Application specific formulations.

Processability

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.

 $kB = \text{no fracture}$ 

Competence in Polyurethanes

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 on request:

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

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