Bayer MaterialScience

Product Range – Reference Data

DESMOPAN®

Desmopan® (TPU)

Overview of product grades – Guide values

Edition: 01.2010

Introduction

Desmopan® is the trade name for the thermoplastic polyurethanes (TPU) produced by Bayer MaterialScience AG.

The Desmopan® range has been developed to comply with the many specific requirements existing in the highly diverse areas of application. The range comprises eight standard product lines based on different raw material groups and three product lines consisting of specialty grades.

Overviews

- Nomenclature
- Comparison of properties of the product ranges (for preliminary material selection)
- Overview of the product grades (grouped according to Shore hardness and raw material)
- Brief descriptions of the grades and guide data tables

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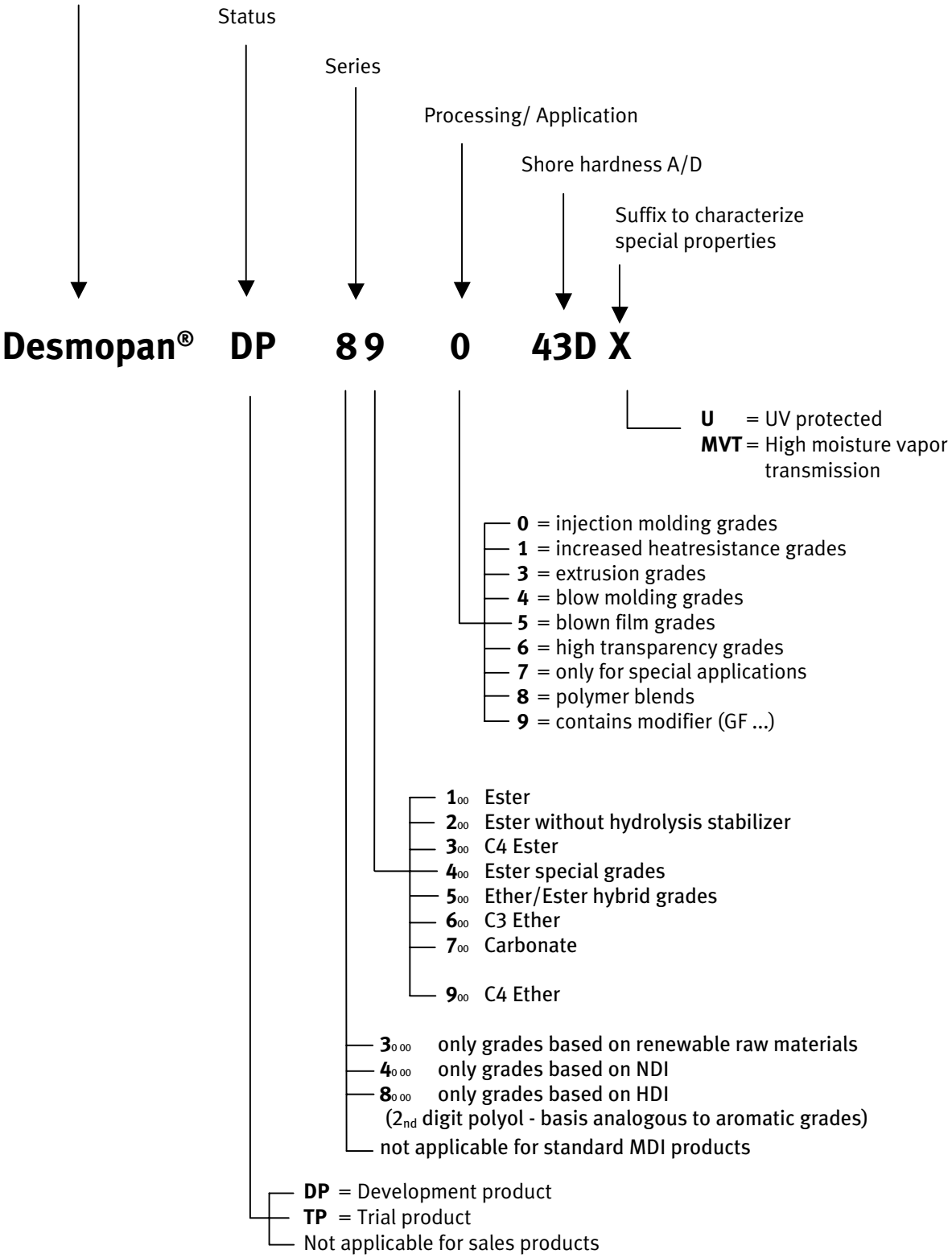
www.desmopan.com

Nomenclature key for Desmopan grades

Trade name



Comparison of the properties of the Desmopan® grades

Product range	Shore hardness range	Brief description	Properties								
			Wear resistance	Dynamic load-bearing capacity	Heat resistance	Oil and grease resistance	Hydrolysis resistance	Hot air resistance	UV resistance (yellowing)	Microbial resistance	Low-temperature flexibility
100/Esters	80A–50D	Injection molding and extrusion grades with high mechanical strength for heavy-duty articles	++	++	+	+	o	+	o	—*	+
200/Esters	85A–94A	Injection molding, extrusion and sintering grades, suitable for food-contact applications	++	++	o	+	—	+	o	—	+
300/Esters	60A–73D	Injection molding and extrusion grades with high mechanical strength, improved hydrolysis resistance and low-temperature flexibility	++	++	+	+	+	+	o	—*	+
400/Esters	80A–60D	Injection molding grades with low compression set, high heat distortion temperature, good resistance to grease and oil	++	++	++	++	+	++	o	o*	+
500/Ether-esters	77A–90A	Injection molding and extrusion grades that economically combine the advantages of ester and ether grades	o/+	o	o	+	+	—	o	+	+
600/Ethers	65A	Injection molding grade with excellent hydrolysis and microbial resistance but lower mechanical properties	—	—	o	+	++	—	o	++	++
700/Carbonates	88A–45D	Injection molding and extrusion grades with good microbial and hydrolysis resistance and low swelling in water	+	+	o	+/ ++[1)]	++	o	o	+	+
W8000/Aliphatics	85A–90A	Injection molding and slush grades that do not yellow when exposed to UV radiation	+	o	o/+	+	+/ ++[1)]	+/ —[1)]	++	—/ ++[1)]	+/ ++[1)]
900/Ethers	70A–73D	Injection molding and extrusion grades with very good hydrolysis and microbial resistance, excellent low-temperature flexibility	+	o	o	+	++	—	o	++	++
Impact-mod. esters	55D–66D	Special grades for shoe shells and similar applications with high stiffness and good low-temperature impact strength	+	++	o	+	+	+	o	o	++

++ very good
+ good
o satisfactory
— moderate
***** improves with increasing hardness
[1)] dependent on the grade

Overview of product grades (grouped according to shore hardness and raw material)

Shore hardness	Raw material group	Ester				Ether/ ester	C_3 ether	Carbonate	Aliphatics	Ether	Impact-modified ester
	Series	100	200	300	400	500	600	700	8000	900	
55–64A				DP 3360A							
65–79A				DP 3070AU		5377A	DP 6065A			DP 9370A/AU	
75–79A											
80–84A		DP 1080A/AU		DP 3380A	481	DP 5080A				DP 9380A/AU	
85–89A		DP 1085A	DP 2586A	385E/S	487	588E		786E/S	DP 85784A	9385	
		DP 1485A	DP 2786AS045	3385A					DP 85085A	DP 9386A	
			DP 2786A	3485A					DP 85786A		
									DP 89085A		
90–94A		DP 1490A	DP 2590A	DP 3491A				790	DP 89043D	DP 9392AU	
	192			392							
		DP 1092A	DP 2792A	DP 3690AU							
45–49D				DP 3695AU	445			795U		DP 9395AU	
										DP 9095AU	
										DP 9648DU	
50–54D	150	DP 1350D			453 DPS 041					DP 9650DU	
55–59D				DP 3055D						DP 9855D	DP 8715
				DP 3059D						DP 9659DU	DP 8529
60–64D				DP 3660DU	460					DP 9662DU	DP 8377
										DP 9864D	
65–69D				DP 3065D						DP 9665DU	DP 8417
										DP 9868D	
70–74D				DP 3072D						DP 9873D	

■ = Trial Product (see disclaimer for trial products)

100 series, ester grades (1)

Injection molding, extrusion and blow-molding grades with high mechanical strength. In extrusion, the grades in this range are noted for the fact that there is no crystallization of the melt even with long residence times. Used predominantly for heavy-duty articles such as castors, rollers, shoe heels, pneumatic hoses, bellows.

DP 1080A **Shore hardness: 80A,**
Injection molding grade
free of plasticizers
Applications:
rigid/flexible composite systems, engineering components

DP 1080AU **As DP 1080A,**
but with special UV stabilizers

DP 1085A **Shore hardness: 85A,**
Injection molding grade
hydrolysis-stabilised, high mechanical strength, very short cycle times
Application:
injection molded engineering parts, screenpacks

DP 1485A **Shore hardness: 86A/33D,**
Extrusion and injection molding grade
suitable for extrusion blow molding, very wide processing range
Applications:
bellows, unreinforced hoses, profiles, injection-molded engineering components

DP 1490A **Shore hardness: 92A/40D,**
Extrusion and injection molding grade
suitable for extrusion blow molding, very wide processing range
Applications:
bellows, unreinforced hoses, profiles, injection-molded engineering components

Desmopan®				100 grade series, ester grades (1)			
Typical properties	Test conditions	Units	Standards	DP 1080A/AU	DP 1085A	DP 1485A	DP 1490A
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	80	85	86	92
Shore hardness, method D		–	ISO 868		33	33	40
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	34.6	37	46	52
Strain at break	200 mm/min	%	DIN 53504	623	700	630	530
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	4.3	5.8	5	8.9
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	9.6	10	9	18.2
Compression set	24 h; 70 °C	%	ISO 815	39	43	36	47
Compression set	72 h; 23 °C	%	ISO 815	22	19	11	24
Abrasion resistance	–	mm^3	ISO 4649	35	20	19	35
Impact resilience	–	%	ISO 4662	44	41	46	30
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	56	75	78	93
Flexural modulus	2 mm/min	MPa	ISO 178				
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	171	320	390	1070
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	34	31	44	106
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	24	21	32	62
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1206	1208	1216	1220
Molding conditions							
Injection molding–Melt temperature	–	°C	–	185–200	190–230	200–220	200–220
Injection molding–Mold temperature	–	°C	–	20	20-40	20	20
Extrusion–Melt temperature	–	°C	–			180-200	
Maximum drying temperature		°C		80	90	80	80

DP = Trial Product (see disclaimer for trial products)

100 series, ester grades (2)

Injection molding, extrusion and blow-molding grades with high mechanical strength. In extrusion, the grades in this range are noted for the fact that there is no crystallization of the melt even with long residence times. Used predominantly for heavy-duty articles such as castors, rollers, shoe heels, pneumatic hoses, bellows.

192 **Shore hardness: 94A/42D,**
Injection molding grade
with high mechanical strength,
for heavy-duty articles
Applications:
gear knobs, roller coverings,
coupling elements, shoe heels

DP 1092A **Shore hardness: 92A,**
Injection molding grade
hydrolysis-stabilised; high mechanical strength, very short cycle times
Application:
shift lever balls, roller tires,
coupling elements, shoe heels

150 **Shore hardness: 96A/50D,**
Injection molding grade
with high mechanical strength,
for heavy-duty articles

DP 1350D **Shore hardness: 96A/50D,**
Extrusion grade
good wear resistance, high melt stability, high bursting pressure
Applications:
pneumatic hose

Desmopan®				100 grade series, ester grades (2)			
Typical properties	Test conditions	Units	Standards	192	DP 1092A	150	DP 1350D
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	94	92	96	96
Shore hardness, method D		–	ISO 868	42	42	50	52
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	47	44	57.3	65
Strain at break	200 mm/min	%	DIN 53504	500	600	407	361
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	10.2	9.5	17.6	22.2
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	22.3	15	39.9	53.2
Compression set	24 h; 70 °C	%	ISO 815	60	41	50	49
Compression set	72 h; 23 °C	%	ISO 815	25	25	25	25
Abrasion resistance	–	mm^3	ISO 4649	30	20	30	29
Impact resilience	–	%	ISO 4662	30	40	30	31
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	100	100	120	134
Flexural modulus	2 mm/min	MPa	ISO 178			130	145
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	450	874	1260	2340
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	93	74	186	298
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	48	40	70	121
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1230	1211	1240	1240
Molding conditions							
Injection molding–Melt temperature	–	°C	–	210-225	190–230	210–230	210–230
Injection molding–Mold temperature	–	°C	–	20-40	20–40	20–40	21–40
Extrusion–Melt temperature	–	°C	–			210–230	195–215
Maximum drying temperature		°C		90	110	110	110

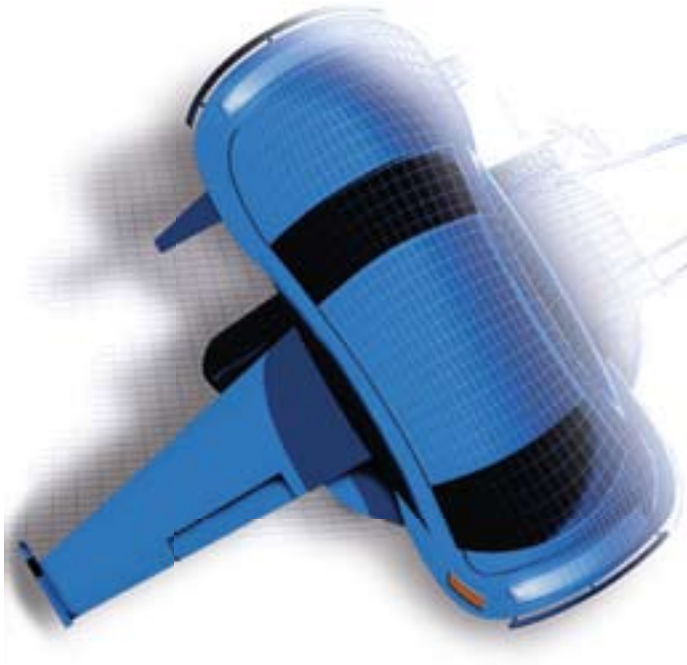
200 series, ester grades

Blown film and coating grades that can be used for the production of commodity goods in food-contact applications (see page 22).

DP 2586A
DP 2590A
Extrusion and injection molding grades developed specifically for the production of blown film without a backing film

DP 2786A
DPS045
Modifications for textile coating with extrusion calenders and laminating calenders

DP 2786A
DP 2792A
These two grades have been developed specifically for sintering and textile coating



Desmopan®				100 grade series, ester				
Typical properties	Test conditions	Units	Standards	DP 2586A	DP 2590A	DP 2786A DPS 045	DP 2786A	DP 2792A
Mechanical properties (23 °C/50 % r. h.)								
Shore hardness, method A		–	ISO 868	86	92	86	88	93
Shore hardness, method D		–	ISO 868	38		38		50
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	51.9	52.7	32	26.5	29
Strain at break	200 mm/min	%	DIN 53504	502	375	640	540	510
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	6.2	13.5	5.8	6.7	10.6
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	20.1	37.8	10.0	12.3	19.3
Compression set	24 h; 70 °C	%	ISO 815	45	53	45	52	69
Compression set	72 h; 23 °C	%	ISO 815	23	24	23	17	26
Abrasion resistance	–	mm^3	ISO 4649	32	60	32	86	70
Impact resilience	–	%	ISO 4662	46	25	46	37	29
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	71	100	71	69	99
Flexural modulus	2 mm/min	MPa	ISO 178					
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	188	1710	188	404	1340
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	47	130	47	41	95
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	34	57	34	23	43
Other properties (23 °C)								
Density	–	kg/m^3	ISO 1183	1190	1205	1190	1205	1205
Molding conditions								
Injection molding–Melt temperature	–	°C	–	210–230	210–230	210–230	190–210	190–220
Injection molding–Mold temperature	–	°C	–	20–40	20	20–40	20	20–40
Extrusion–Melt temperature	–	°C	–	195–215	190–210	180–200	190–210	180–210
Maximum drying temperature		°C		80	80	80	80	80

DP = Trial Product (see disclaimer for trial products)

300 series, ester grades (1)

Injection molding and extrusion grades with high mechanical strength plus improved hydrolysis resistance and low-temperature flexibility. Low swelling values in oils, greases and solvents.

This is the most frequently used range of products for extruded articles of all types and for highly stressed structural parts.

DP 3360A **Shore hardness: 62A,**
Extrusion and injection molding grade
plasticizer-free, low abrasion
Applications:
sports shoe soles, rigid/flexible composite systems, films

DP 3070AU **Shore hardness: 70A, Injection molding grade**
plasticizer-free
Applications:
injection-molded engineering components, rigid/flexible composite systems with special UV stabilizers

DP 3380A **Shore hardness: 80A,**
Extrusion grade
free from plasticizers
Applications:
hoses, reinforced, profiles

385E/S **Shore hardness: 85A/32D,**
Extrusion and injection molding grade
Applications:
films, unreinforced hoses, screen construction elements, engineering components, rigid/flexible composite systems

Desmopan®				300 grade series, ester grades (1)			
Typical properties	Test conditions	Units	Standards	DP 3360A	DP 3070AU	DP 3380A	385E/S
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	62	70	80	85
Shore hardness, method D		–	ISO 868				32
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	28.7	25	41.1	51
Strain at break	200 mm/min	%	DIN 53504	754	800	491	425
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	2	2.5	5.2	6.5
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	3.8	4.6	12.3	26
Compression set	24 h; 70 °C	%	ISO 815	46	52	42	50
Compression set	72 h; 23 °C	%	ISO 815	20	24	18	25
Abrasion resistance	–	mm^3	ISO 4649	40	50	20	30
Impact resilience	–	%	ISO 4662	49	47	41	42
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	33	36	58	70
Flexural modulus	2 mm/min	MPa	ISO 178				
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	52	55	193	186
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	11	17	31	51
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	8	12	22	37
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1154	1148	1160	1200
Molding conditions							
Injection molding–Melt temperature	–	°C	–	185–215	185–215	185–200	210–230
Injection molding–Mold temperature	–	°C	–	20	20	20	20–40
Extrusion–Melt temperature	–	°C	–		175–190	200–220	
Maximum drying temperature		°C		80	80	80	80

300 series, ester grades (2)

Injection molding and extrusion grades with high mechanical strength, improved hydrolysis resistance and low-temperature flexibility. Low swelling values in oils, greases and solvents.

This is the most frequently used product range for all kinds of extruded articles and highly stressed structural parts.

3385A **Shore hardness: 85A/33D,**
Extrusion and injection molding grade
good wear resistance, short cycle times, high melt stability
Applications:
rigid/flexible composite systems, unreinforced hoses, profiles, injection-molded engineering components

3485A **Shore hardness: 85A/33D,**
Extrusion and injection molding grade
suitable for extrusion blow molding, with mold release agent, high melt stability
Applications:
bellows, injection-molded engineering components

DP 3491A **Shore hardness: 92A/40D,**
Extrusion and injection molding grade
suitable for extrusion blow molding, high melt stability

392 **Shore hardness: 92A/40D,**
Extrusion and injection molding grade
Applications:
toothed belts, profiles, unreinforced hoses

Desmopan®				300 grade series, ester grades (2)			
Typical properties	Test conditions	Units	Standards	3385A	3485A	DP 3491A	392
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	85	85	92	92
Shore hardness, method D		–	ISO 868	33	33	40	40
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	53	50	52.9	51
Strain at break	200 mm/min	%	DIN 53504	490	500	462	486
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	6	6	9.0	9.3
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	19.5	17.8	29.4	26.9
Compression set	24 h; 70 °C	%	ISO 815	42	42	50	41
Compression set	72 h; 23 °C	%	ISO 815	15	15	20	25
Abrasion resistance	–	mm^3	ISO 4649	25	25	25	25
Impact resilience	–	%	ISO 4662	50	50	36	33
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	70	70	100	80
Flexural modulus	2 mm/min	MPa	ISO 178	17	17		
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	84	140	515	455
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	28	42	94	90
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	21	32	59	59
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1200	1200	1200	1210
Molding conditions							
Injection molding–Melt temperature	–	°C	–	190–210	190–210	190–210	210–230
Injection molding–Mold temperature	–	°C	–	20	20–40	20–40	20–40
Extrusion–Melt temperature	–	°C	–	175–205		200–220	
Maximum drying temperature		°C		80	80	80	80

DP = Trial Product (see disclaimer for trial products)

300 series, ester grades (3) *(new generation)*

The grades in the 300 series shown on this page are a further development of the proven Desmopan 355, 359 etc. grades. In addition to their otherwise unchanged properties, they offer improved wear resistance and shorter cycle times during processing.

DP 3055D **Shore hardness: 96A/56D,**
Injection molding grade
with high mechanical strength for heavy-duty articles, good wear resistance, very short cycle times
Applications:
injection-molded engineering components, castors and rollers

DP 3059D **Shore hardness: 97A/59D,**
Injection molding grade
with mold release agent, excellent abrasion resistance, good wear resistance, very short cycle times
Applications:
heel patches, castors and rollers, shoe shells, injection-molded engineering components

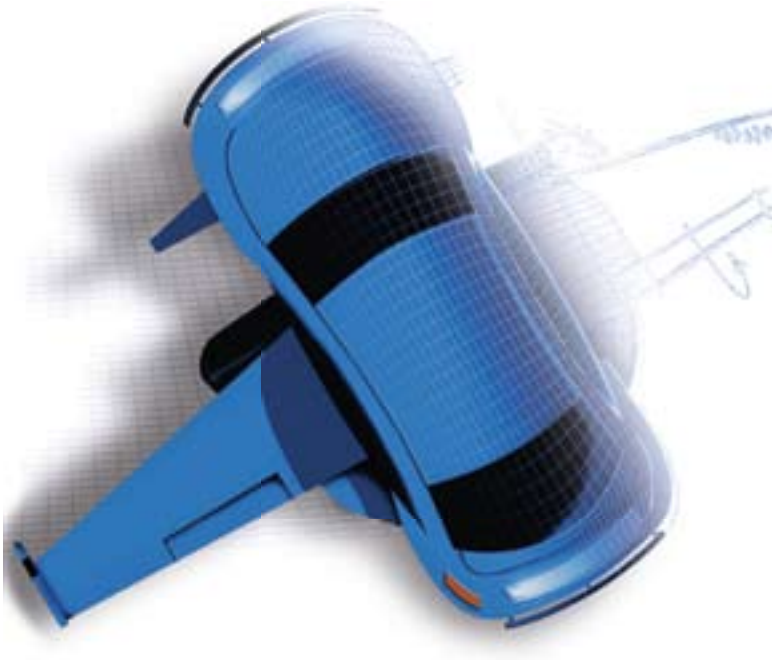
DP 3065D **Shore hardness: 98A/65D,**
Injection molding grade
high mechanical strength, outstanding abrasion resistance, good wear resistance, very short cycle times
Applications:
engineering components

DP 3072D **Shore hardness: 98A/72D,**
Injection molding grade
high mechanical strength, outstanding abrasion resistance, good wear resistance, very short cycle times
Applications:
engineering components

Desmopan®				300 grade series, ester grades (1)			
Typical properties	Test conditions	Units	Standards	DP 3055D	DP 3059D	DP 3065D	DP 3072D
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	96	97	98	98
Shore hardness, method D		–	ISO 868	56	59	65	72
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	46	62.7	60	60
Strain at break	200 mm/min	%	DIN 53504	320	356	380	350
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	19.3	24.4	26	34
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	42.9	51.8	45	52
Compression set	24 h; 70 °C	%	ISO 815	43	46	38	49
Compression set	72 h; 23 °C	%	ISO 815	21	24	26	29
Abrasion resistance	–	mm^3	ISO 4649	26	18	18	20
Impact resilience	–	%	ISO 4662	35	35	50	47
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	136	160	180	256
Flexural modulus	2 mm/min	MPa	ISO 178	128	180	350	800
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	1200	2435	2620	3330
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	256	586	948	1275
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	117	181	264	385
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1220	1230	1220	1240
Molding conditions							
Injection molding–Melt temperature	–	°C	–	220–240	220–240	225–245	225–245
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20–40	20–40
Extrusion–Melt temperature	–	°C	–				
Maximum drying temperature		°C		110	110	110	110

300 series, ester grades (4) *(transparent grades)*

All the highly transparent grades listed here are hydrolysis-stabilized and have special UV protection. They can be used for clear, transparent injection molded parts with a wall thickness of up to 6 mm. Hoses, flat film and profiles can also be extruded from these grades.



Desmopan®				300 grade series, ester grades (4)		
Typical properties	Test conditions	Units	Standards	DP 3690AU	DP 3695AU	DP 3660DU
Mechanical properties (23 °C/50 % r. h.)						
Shore hardness, method A		–	ISO 868	93	95	98
Shore hardness, method D		–	ISO 868	40	48	62
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	59.8	59	59.8
Strain at break	200 mm/min	%	DIN 53504	428	389	311
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	9.8	14.2	29.3
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	32.8	38.8	55.7
Compression set	24 h; 70 °C	%	ISO 815	48	52	47
Compression set	72 h; 23 °C	%	ISO 815	21	22	24
Abrasion resistance	–	mm^3	ISO 4649	25	23	23
Impact resilience	–	%	ISO 4662	29	25	31
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	95	112	170
Flexural modulus	2 mm/min	MPa	ISO 178			110
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	940	1670	2610
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	94	139	444
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	54	66	129
Other properties (23 °C)						
Density	–	kg/m^3	ISO 1183	1211	1218	1229
Molding conditions						
Injection molding–Melt temperature	–	°C	–	215–235	215–235	215–235
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20–40
Extrusion–Melt temperature	–	°C	–	180–210		
Maximum drying temperature		°C		80	110	110

DP = Trial Product (see disclaimer for trial products)

400 series, ester grades

Thanks to the use of various specialty raw materials and auxiliaries, this product range offers a number of special properties. Compared with the 100 and 300 ranges of ester grades, improvements have been made (depending on the grade) to:

– compression set
– elasticity
– heat resistance
– hydrolysis resistance
– oil/grease resistance
– microbial resistance

These injection molding grades are used primarily in functional engineering components for automotive, mechanical and plant engineering.

481 **Shore hardness: 80A/30D,**
Injection molding grade
plasticizer-free, grease and oil-resistant, low compression set, high elasticity, high heat resistance, easily demolded
Applications:
rollers, seals, membranes, automotive engineering

487 **Shore hardness: 86A/34D,**
Injection molding grade
grease and oil-resistant, low compression set, high heat resistance, short cycle times
Applications: automotive engineering, rollers, seals, membranes, damping elements

445 **Shore hardness: 93A/44D,**
Injection molding grade
grease and oil-resistant, high heat resistance, low compression set
Applications: automotive engineering, injection-molded engineering components

453 DPS041 **Shore hardness: 97A/52D,**
Injection molding grade
grease and oil-resistant, hydrolysis-stabilized, low compression set, good wear resistance
Applications: injection-molded engineering components, automotive engineering, coupling elements

460 **Shore hardness: 97A/58D,**
Injection molding grade
grease and oil-resistant, low compression set, high heat resistance, short cycle times
Applications: automotive engineering, technical components

Desmopan®				400 grade series, ester				
Typical properties	Test conditions	Units	Standards	481	487	445	453 DPS 041	460
Mechanical properties (23 °C/50 % r. h.)								
Shore hardness, method A		–	ISO 868	80	86	93	97	97
Shore hardness, method D		–	ISO 868	30	34	44	52	58
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	30	33.9	54.6	38.7	44.3
Strain at break	200 mm/min	%	DIN 53504	600	465	502	432	339
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	5.0	6.3	13	19.2	25.3
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	9.0	19.3	29.3	31.4	39.5
Compression set	24 h; 70 °C	%	ISO 815	35	30	35	27	35
Compression set	72 h; 23 °C	%	ISO 815	22	15		15	25
Abrasion resistance	–	mm^3	ISO 4649	25	20	25	32	40
Impact resilience	–	%	ISO 4662	48	45	35	30	35
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	45	70	95	180	150
Flexural modulus	2 mm/min	MPa	ISO 178					170
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	106	225	790	1780	1760
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	33	61	103	240	446
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	29	46	58	110	130
Other properties (23 °C)								
Density	–	kg/m^3	ISO 1183	1200	1210	1220	1230	1220
Molding conditions								
Injection molding–Melt temperature	–	°C	–	225–235	230–240	210–235	220–240	235–245
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20–40	20–40	20–40
Extrusion–Melt temperature	–	°C	–					
Maximum drying temperature		°C		80	80	110	110	110

500 series, ether/ester grades

Economical ether/ester grades combining the advantages of both classes of raw materials. They are used in applications where mechanical stresses occur with a simultaneous risk of damage through microorganisms. Areas of application include extrusion coating, seals, injection-molded engineering components and watch straps.

5377A **Shore hardness: 77A/28D,**
Extrusion and injection molding grade
improved microbial resistance,
improved hydrolysis resistance
Applications:
fabric coating, watch straps

DP 5080A **Shore hardness: 80A/29D,**
Injection molding grade
improved microbial resistance,
improved hydrolysis resistance
Applications:
seals, membranes,
rigid/flexible composite systems

588E **Shore hardness: 88A/33D,**
Extrusion and injection molding grade
improved microbial resistance,
improved hydrolysis resistance
Applications:
cable sheathings, non-reinforced hoses,
roof linings

600 series, ether grades

The grades in the 600 range can be used as an economical solution where the hydrolysis stability and microbial resistance of the 900 range are specified, but the demands made on the mechanical properties are lower. Potential applications include rigid/flexible combinations.

DP 6065A **Shore hardness: 66A,**
Injection molding grade
plasticizer-free, excellent hydrolysis and microbial resistance,
very short cycle times
Applications:
rigid/flexible composite systems,
shoe soles

Desmopan®				500 grade series, ether/ester			600 grade series, ether
Typical properties	Test conditions	Units	Standards	5377A	DP 5080A	588E	DP 6065A
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	77	80	88	66
Shore hardness, method D		–	ISO 868	28	29	33	
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	27.9	24.8	41.2	17.7
Strain at break	200 mm/min	%	DIN 53504	611	656	550	817
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	5.2	5.7	6.4	2.8
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	9.4	10.2	12.4	5.5
Compression set	24 h; 70 °C	%	ISO 815	50	50	50	36
Compression set	72 h; 23 °C	%	ISO 815	20	20	25	16
Abrasion resistance	–	mm^3	ISO 4649	80	70	60	150
Impact resilience	–	%	ISO 4662	45	45	36	50
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	40	55	55	26
Flexural modulus	2 mm/min	MPa	ISO 178				
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	180	105	165	27
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	29	31	29	10
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	21	23	20	9
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1140	1140	1150	1084
Molding conditions							
Injection molding–Melt temperature	–	°C	–	180–200	190–210	210–230	190–210
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20–40	20–30
Extrusion–Melt temperature	–	°C	–	170–190		190–210	
Maximum drying temperature		°C		80	80	80	80

DP = Trial Product (see disclaimer for trial products)

700 series, carbonate grades

The grades in this range have been developed for specific applications and have been successfully used in practice for many years. They have good microbial and hydrolysis resistance, swell less in water than the ether grades and have mechanical properties comparable with those of the ester grades.

786E/S **Shore hardness: 88A/33D,**
Extrusion and injection molding grade
high mechanical strength, excellent hydrolysis and microbial resistance, good low-temperature flexibility
Applications:
fire extinguisher hoses, films, profiles, engineering components

790 **Shore hardness: 92A/40D,**
Extrusion and injection molding grade
good hydrolysis and microbial resistance, high mechanical strength, good low-temperature flexibility
Applications:
toothed belts, profiles, injection-molded engineering components

795U **Shore hardness: 94A/43D,**
Injection molding grade
with special UV stabilizers, good hydrolysis and microbial resistance, short cycle times
Applications:
animal identification tags

Desmopan®				700 grade series, carbonates		
Typical properties	Test conditions	Units	Standards	786 E/S	790	795U
Mechanical properties (23 °C/50 % r. h.)						
Shore hardness, method A		–	ISO 868	88	92	94
Shore hardness, method D		–	ISO 868	33	40	43
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	40	50.3	50.7
Strain at break	200 mm/min	%	DIN 53504	458	437	393
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	8.4	11.3	11.6
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	19.8	32.4	14.2
Compression set	24 h; 70 °C	%	ISO 815	55	50	42
Compression set	72 h; 23 °C	%	ISO 815	25	25	22
Abrasion resistance	–	mm^3	ISO 4649	40	30	25
Impact resilience	–	%	ISO 4662	32	32	32
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	60	85	102
Flexural modulus	2 mm/min	MPa	ISO 178			72
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	400	630	1040
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	35	100	146
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	20	53	51
Other properties (23 °C)						
Density	–	kg/m^3	ISO 1183	1150	1210	1200
Molding conditions						
Injection molding–Melt temperature	–	°C	–	210–230	210–230	210–230
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20–40
Extrusion–Melt temperature	–	°C	–	190–210		
Maximum drying temperature		°C		80	80	80

8000 series, aliphatics

Products based on an aliphatic isocyanate combine the familiar TPU properties with resistance to yellowing due to UV light. These products are therefore particularly suitable for colored applications in the automotive segment.

We are carrying out intensive product development activities in the field of aliphatic products, as a result of which our product portfolio is being continuously optimized. Apart from the products listed here for injection molding, slush and extrusion applications, we can, on request, also provide you with further information about our latest product developments.

DP 85085A **Shore hardness: 85A,**
Injection molding grade
improved microbial resistance,
good low-temperature flexibility,
improved hydrolysis resistance
Applications:
automotive interior applications

DP 85784A **Shore hardness: 87A,**
Special grade for slush applications
no yellowing on exposure to UV light,
good low-temperature flexibility,
high resilience, improved microbial resistance, improved hydrolysis resistance,
optimized scratch resistance
Applications:
automotive interior applications

DP 85786A **Shore hardness: 90A,**
Calender coating grade
good low-temperature flexibility,
high resilience,
improved microbial resistance,
improved hydrolysis resistance
Applications: fabric coating

DP 89085A **Shore hardness: 85A,**
Injection molding grade
no yellowing under the action of UV light, very good hydrolysis and microbial resistance, good low-temperature flexibility, high rebound resilience, low abrasion
Applications:
colored applications in the automotive, sports and leisure sectors

DP 89043D **Shore hardness: 43D,**
Injection molding grade
no yellowing under the action of UV light, very good hydrolysis and microbial resistance, good low-temperature flexibility, high rebound resilience, low abrasion
Applications:
colored applications in the automotive, sports and leisure sectors

Desmopan®				800 grade series, aliphatics				
Typical properties	Test conditions	Units	Standards	DP 85085A	DP 85784A	DP 85786A	DP 89085A	DP 89043D
Mechanical properties (23 °C/50 % r. h.)								
Shore hardness, method A		–	ISO 868	85	87	90	86	95
Shore hardness, method D		–	ISO 868				33	43
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	29.6	16.3	28	33	40
Strain at break	200 mm/min	%	DIN 53504	771	723	850	750	700
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	6.4	5.9	7	7	12
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	10.4	8.9	11	10	18
Compression set	24 h; 70 °C	%	ISO 815	42	32	43	44	41
Compression set	72 h; 23 °C	%	ISO 815	18	23	12	18	
Abrasion resistance	–	mm^3	ISO 4649	28	107	30	31	11
Impact resilience	–	%	ISO 4662	63	59	62	64	56
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	75	42	74	42	96
Flexural modulus	2 mm/min	MPa	ISO 178					80
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	207	130	220	260	230
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	86	45	83	65	143
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	55	24	56	50	101
Other properties (23 °C)								
Density	–	kg/m^3	ISO 1183	1130	1132	1130	1080	1080
Molding conditions								
Injection molding–Melt temperature	–	°C	–	180–210	190–210	170–190	200–220	210–230
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20	20–40	40–60
Extrusion–Melt temperature	–	°C	–			170–190		
Maximum drying temperature		°C		80	80	80	80	110

DP = Trial Product (see disclaimer for trial products)

900 series, ether grades (1)

Products with very good hydrolysis and microbial resistance. An additional characteristic is their very good low-temperature flexibility. The 900 series is used, for example, in applications where good flexibility or impact strength is required at very low temperatures.

Some of the following products can be used for food-contact applications (see page 22).

DP 9370A **Shore hardness: 70A,**
Extrusion and injection molding grade
good low-temperature flexibility,
plasticizer-free,
high water vapor permeability
Applications:
roof linings, seals, membranes, films,
rigid/flexible composite systems,
sports shoe soles

DP 9370AU **as DP 9370A,** but with special UV stabilizers

DP 9380A **Shore hardness: 82A/31D,**
Extrusion and injection molding grade
good low-temperature flexibility,
complies with DIN VDE 0282-10
Applications:
cable sheathings, non-reinforced hoses

DP 9380AU **as DP 9380A,** but with UV stabilizer

9385A **Shore hardness: 86A/35D,**
Extrusion and injection molding grade
good low-temperature flexibility,
complies with DIN VDE 0282-10
Applications:
cable sheathings, unreinforced hoses

DP 9386A **Shore hardness: 85A,**
Extrusion and injection molding grade
excellent hydrolysis and microbial resistance, good low-temperature flexibility,
complies with DIN VDE 0282-10,
very wide processing range
Applications:
cable sheathings, unreinforced hoses,
profiles

Desmopan®				900 grade series, ether grades (1)			
Typical properties	Test conditions	Units	Standards	DP 9370A/AU	DP 9380A/AU	9385A	DP 9386A
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	70	82	86	85
Shore hardness, method D		–	ISO 868		31	35	34
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	26.1	38.0	42.5	36.7
Strain at break	200 mm/min	%	DIN 53504	697	526	517	496
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	3.1	5.4	7.2	7.3
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	6.2	11.0	15.3	14.8
Compression set	24 h; 70 °C	%	ISO 815	49	42	43	36
Compression set	72 h; 23 °C	%	ISO 815	22	25	25	28
Abrasion resistance	–	mm^3	ISO 4649	69	20	25	84
Impact resilience	–	%	ISO 4662	63	50	40	45
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	39	50	65	60
Flexural modulus	2 mm/min	MPa	ISO 178				
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	125	73	118	152
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	11	37	32	48
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	9	30	23	35
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1060	1110	1120	1110
Molding conditions							
Injection molding–Melt temperature	–	°C	–	190–210	205–225	205–225	205–225
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20–40	20–40
Extrusion–Melt temperature	–	°C	–	175–210	195–215	195–215	180–210
Maximum drying temperature		°C		80	80	80	80

900 series, ether grades (2)

Products with very good hydrolysis and microbial resistance; an additional characteristic is very good low-temperature flexibility. The 900 series is used, for example, in applications where good flexibility or impact strength is required at very low temperatures.

Some of the following products can be used for food-contact applications (see page 22).

DP 9392AU **Shore hardness: 92A/42D,**
Extrusion and injection molding grade
good low-temperature flexibility,
with UV stabilizer
Applications:
non-reinforced hoses, cable sheathings,
profiles, technical components

DP 9395AU **Shore hardness: 95A/46D,**
Extrusion and injection molding grade
good low-temperature flexibility
with UV stabilizer
Applications:
pneumatic hoses, cable sheathings, profiles,
injection-molded engineering components

DP 9095AU **Shore hardness: 95A/43D,**
Injection molding grade
with UV stabilizers, good wear resistance,
low warpage tendency, short cycle times
Applications:
animal identification tags

Desmopan®				900 grade series, ether grades (2)		
Typical properties	Test conditions	Units	Standards	DP 9392AU	DP 9395AU	DP 9095AU
Mechanical properties (23 °C/50 % r. h.)						
Shore hardness, method A		–	ISO 868	92	95	96
Shore hardness, method D		–	ISO 868	42	46	43
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	49	56.6	52
Strain at break	200 mm/min	%	DIN 53504	407	456.6	364
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	11.5	13.5	16.5
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	29.6	29.6	38.6
Compression set	24 h; 70 °C	%	ISO 815	40	40	77
Compression set	72 h; 23 °C	%	ISO 815	20	22	30
Abrasion resistance	–	mm^3	ISO 4649	20	30	18
Impact resilience	–	%	ISO 4662	32		33
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	85	100	129
Flexural modulus	2 mm/min	MPa	ISO 178		55	
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	700	440	790
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	132	104	161
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	71	55	82
Other properties (23 °C)						
Density	–	kg/m^3	ISO 1183	1150	1150	1149
Molding conditions						
Injection molding–Melt temperature	–	°C	–	210–230	210–230	200–220
Injection molding–Mold temperature	–	°C	–	20–40	20–40	20
Extrusion–Melt temperature	–	°C	–	195–215	200–220	
Maximum drying temperature		°C		80	110	80

DP = Trial Product (see disclaimer for trial products)

900 series, ether grades (3)

Products offering very good hydrolysis and microbial resistance. They also have excellent low-temperature flexibility. The 900 series is used among other things where good flexibility or impact strength is specified at very low temperatures.

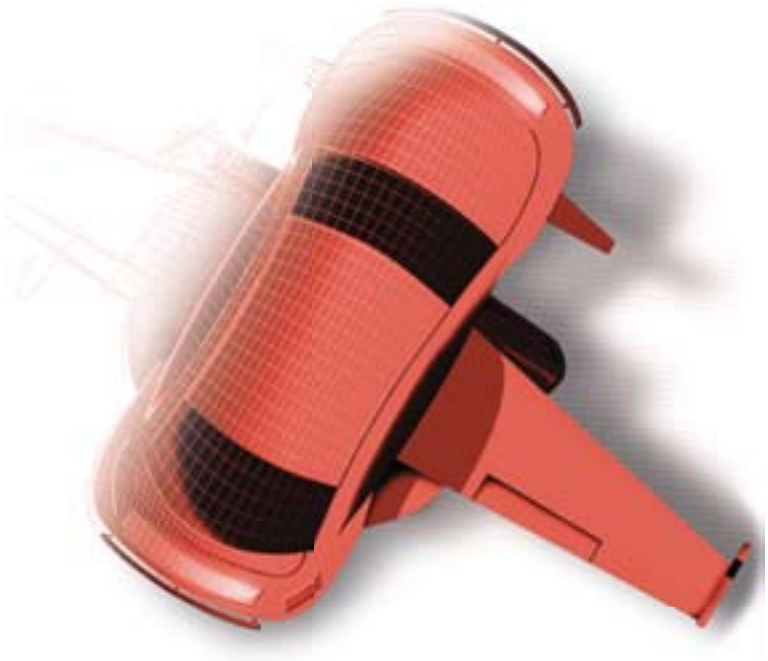
All these products have been provided with special UV protection

Applications:
shoe shells, injection-molded engineering components

Desmopan®				900 grade series, ether grades (3)			
Typical properties	Test conditions	Units	Standards	DP 9855DU	DP 9864DU	DP 9868DU	DP 9873D
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	98	98	98	98
Shore hardness, method D		–	ISO 868	57	62	66	73
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	53.2	54	53.3	49
Strain at break	200 mm/min	%	DIN 53504	390	400	337	300
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	20.2	25	28.1	36
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	37.4	39	46.6	49
Compression set	24 h; 70 °C	%	ISO 815	40	38	82	92
Compression set	72 h; 23 °C	%	ISO 815	31	36	73	80
Abrasion resistance	–	mm^3	ISO 4649	27	21	30	
Impact resilience	–	%	ISO 4662	43	46	47	45
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	104	142	150	200
Flexural modulus	2 mm/min	MPa	ISO 178	215	295	540	950
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	1085	1370	1410	1800
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	375	652	870	1285
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	143	219	330	616
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1160	1170	1170	1190
Molding conditions							
Injection molding–Melt temperature	–	°C	–	220–235	225–235	225–235	225–235
Injection molding–Mold temperature	–	°C	–	40–60	40–60	40–60	40–60
Extrusion–Melt temperature	–	°C	–				
Maximum drying temperature		°C		110	110	110	110

900 series, ether grades (4) *(transparent grades)*

The highly transparent ether grades listed here have been given special UV protection. These products can be used to produce clear, highly transparent injection-molded parts with a wall thickness of up to 6 mm with short cycle times. Flat films, hoses and profiles can also be extruded with these grades.



Desmopan®				900 grade series, ether grades (4)				
Typical properties	Test conditions	Units	Standards	DP 9648DU	DP 9650DU	DP 9659DU	DP 9662DU	DP 9665DU
Mechanical properties (23 °C/50 % r. h.)								
Shore hardness, method A		–	ISO 868	94	96	97	97	98
Shore hardness, method D		–	ISO 868	46	53	59	62	65
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	47	51.7	56.5	60.7	66.4
Strain at break	200 mm/min	%	DIN 53504	44	336	315	339	333
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	14.7	21.8	25.8	26.2	31.0
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	30.5	44.9	51.4	50.4	55.4
Compression set	24 h; 70 °C	%	ISO 815	44	45	82	87	53
Compression set	72 h; 23 °C	%	ISO 815	38	23	37	59	39
Abrasion resistance	–	mm^3	ISO 4649	20	25	20	20	19
Impact resilience	–	%	ISO 4662	33	27	29	31	40
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	114	140	89	98	208
Flexural modulus	2 mm/min	MPa	ISO 178	64	120	180	210	325
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	860	1940	2000	2530	2250
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	133	363	502	643	816
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	52	130	128	187	215
Other properties (23 °C)								
Density	–	kg/m^3	ISO 1183	1160	1160	1160	1176	1175
Molding conditions								
Injection molding–Melt temperature	–	°C	–	215–235	215–235	220–235	220–235	220–235
Injection molding–Mold temperature	–	°C	–	40–60	40–60	40–60	40–60	40–60
Extrusion–Melt temperature	–	°C	–	200–235	200–235	205–235	205–235	205–235
Maximum drying temperature		°C		110	110	110	110	110

DP = Trial Product (see disclaimer for trial products)

Impact-modified ester grades

These grades were developed primarily for shoe shells and similar applications. The shoe shells and ski boots produced from them are light in weight and offer high stiffness and elasticity with very good low-temperature impact strength. The modified Desmopan® grades also have high scratch and abrasion resistance.

Desmopan®				Impact-modified ester grades			
Typical properties	Test conditions	Units	Standards	DP 8715	DP 8529	DP 8377	DP 8417
Mechanical properties (23 °C/50 % r. h.)							
Shore hardness, method A		–	ISO 868	96	97	97	98
Shore hardness, method D		–	ISO 868	58	60	63	68
Ultimate tensile strength	200 mm/min	MPa	DIN 53504	63	64	62	67
Strain at break	200 mm/min	%	DIN 53504	460	440	420	405
Stress at 100 % strain	200 mm/min	MPa	DIN 53504	20	23	26	31
Stress at 300 % strain	200 mm/min	MPa	DIN 53504	38	41	43	48
Compression set	24 h; 70 °C	%	ISO 815		60		
Compression set	72 h; 23 °C	%	ISO 815		30		
Abrasion resistance	–	mm^3	ISO 4649	25	30	30	30
Impact resilience	–	%	ISO 4662	36	38	38	
Tear propagation resistance	500 mm/min	kN/m	ISO 34-1	130	140	160	190
Flexural modulus	2 mm/min	MPa	ISO 178	210	260	360	600
Tensile storage modulus	-20 °C	MPa	ISO 6721-1,-4	2100	1150	2400	1980
Tensile storage modulus	20 °C	MPa	ISO 6721-1,-4	536	330	705	825
Tensile storage modulus	60 °C	MPa	ISO 6721-1,-4	185	122	263	218
Other properties (23 °C)							
Density	–	kg/m^3	ISO 1183	1170	1200	1200	1180
Molding conditions							
Injection molding–Melt temperature	–	°C	–	225–240	225–240	225–240	225–240
Injection molding–Mold temperature	–	°C	–	40–60	40–60	40–60	40–60
Extrusion–Melt temperature	–	°C	–				
Maximum drying temperature		°C		110	110	110	110

Desmopan®

DP/* ⇢ This is a Sales Product at the developmental stage (a Trial Product). For this reason, no assurances are given as to type conformity, processability, long-term performance characteristics or other production or application parameters. Therefore, the purchaser/user uses the product entirely at his own risk without having been given any warranty or guarantee and agrees that the supplier shall not be liable for any damage, of whatever nature, arising out of such use.

Desmoflex®

Tailor-made TPU blends

Demoflex® ist he trade name for TPU blends based on Desmopan®. Bayer MaterialScience AG and the PTS Group are working together in the very promising field of Desmoflex® TPU blends. By carefully combining the positive characteristics of block copolymers, it is possible to create innovative products with property profiles.

This will enable the partner companies to open up new markets.

Highlights in the development of Desmoflex® to date:

- Dry to the touch, matte surfaces
- Higher strength and lower abrasion than TPS
- Broad processing window and simplified processing behavior compared with soft TPU
- Very good adhesion to a wide range of engineering thermoplastics, particularly to different types of polyamide
- Higher static friction than TPU

The innovative products available under the Desmoflex® brand can easily be tailored to meet customers' specific requirements.

To order Desmoflex® or obtain information and data sheets on individual Desmoflex® grades, contact:

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www.tpe-u.de

Desmovit®

Tailor-made TPU compounds

Desmovit® is the registered trade name for reinforced, additived thermoplastic polyurethanes of geba Group and Bayer MaterialScience AG.
On the basis of Bayer MaterialScience's high-quality TPU types of Desmopan®, both partners develop tailor-made TPU compounds.
Additionally, geba Group offers a separate, comprehensive range of polymer specific colour and additive systems.

The Desmovit® model series meets a variety of specific customer requirements. It is continuously being customized and refined to adhere to the broadly diversified fields of application, in order to complement the classic and well-proven types of Desmopan® and satisfy new customer requests.

The Desmovit®-Family

Desmovit® R (reinforced compounds)

The reinforced thermoplastic polyurethanes Desmovit® R combine a very high level of wear-resistance with very good impact resistance, even at low temperatures. They offer an outstanding heat resistance as well as a coefficient of expansion similar to that of aluminium. Desmovit® R achieves a good paintability and printability as well as, for plastics, an exceptionally good noise absorbance. Ease of flow and a high-level of reproductional accuracy perfect the property profile of this multifunctional material group.

Possible Reinforcing Agents for Desmovit®:

- Glass fibres of different length to improve mechanical properties
- Glass beads to improve dimension stability and reduce shrinkage affinity
- Carbon fibres to increase strength while maintaining a lower desity

Desmovit® LFC (electrically conductive compounds)

The Desmovit® LFC product range offers an outstanding electrical conductibility combined with first-class mechanical values. Additives evenly disseminated in the plastics guarantee reproducible conductibility properties of the entire component in application. Unlike antistatically equipped plastics, components made of Desmovit® LFD are not only conductive on the surface, but throughout the whole structure. In addition, neither specific environmental conditions nor a certain humidity are required to achieve the desired permanent conductibility.

Desmovit® FB (colour and functional batches)

To allow the effective and efficient colouring of Desmovit®, a large colour masterbatch range based on Desmopan® is available. Individual colour matching as well as colour effects are also possible – entirely up to our customers' requests or fields of application.

Extrusion Stabiliser Desmovit® FB2887E

Desmovit® FB2887E stabilises the extrusion of TPU of the brand Desmopan® with respect to pressure, torque etc. In most of the cases it reduces the torque of the extruder by 20–30 %, improves the melt loading amount and – depending on the application – also increases the flow rate

Functional Batch Desmovit® FB 2886M for Matt Surfaces

Desmovit® FB 2886M is an innovative functional batch for the extrusion of TPU of the make Desmopan®. It can be either used as an anti-blocking agent in the extrusion blow moulding of films or as a matting agent for tubes and profiles. It stands out due to its compatibility with all established types of Desmopan®.

To order Desmovit® or obtain information and data sheets on individual Desmovit® grades, contact:

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www.tpe-u.de

Pretreatment of the granules

TPU absorbs moisture from the air, although the extent and speed at which this happens depend on the raw material, the hardness and the climate. To guarantee unproblematical processing and prevent any loss of quality, we recommend drying to a moisture content of ≤ 0.05 %. Moist granules cause bubbles or streaks on the surface of the finished components. The extrudate is then no longer smooth and glossy but foamy and gassy.

A frequent cause of defects is the use of undried functional concentrates. These batches should be predried separately and have a moisture content of ≤ 0.05 %.

A moisture content of ≤ 0.05 % can be reliably achieved with conventional dry air and circulating air dryers. The recommended drying temperatures are between 80 and 100 °C with drying times of 1 – 3 hours. Better drying can be achieved in a shorter time with dry-air dryers.

Dried, hot granules should not be left to cool in the open air, but should be stored in dry containers that can be resealed. The machine hopper must be kept covered at all times.

Coloring

With only a few exceptions, Desmopan® is supplied only in its natural color. This will be somewhere between transparent or translucent and opaque white, depending on the particular grade.

Converters and processors can carry out the coloring process without difficulty. A simple and reliable way to do this is to use color granules with Desmopan® as the carrier material.

Color granules based on polystyrene and SAN resin have limited suitability, while masterbatches based on polyethylene, polypropylene and PVC are unsuitable.

Desmopan® can also be colored with pigments and pastes.

The usual quantities (depending on the wall thickness and color density) are:

Color granules	1.0 – 4 %
Color pastes	0.5 – 1 %
Pigments	0.2 – 0.5 %

Particular care must be taken to ensure that the colorants are dry. Even the addition of 1 % moist color granules can have an effect on the surface and impair demolding.

Food contact

Because different regulations apply for food-contact applications in many countries, no general statement can be made here.
Further information is available at:

www.tpe-u.com or **www.desmopan.com**

Occupational hygiene and environmental protection

Air extraction

Desmopan® can be processed and machined over a wide temperature range, but like all natural and synthetic organic materials, it decomposes above a certain temperature.

The development of smoke signifies that decomposition has started. Depending on the Desmopan® grade, slow decomposition commences at around 240 °C. Further information can be found in our safety data sheets.

We recommend effective exhaust ventilation as a matter of course. This applies particularly to extrusion and welding because, especially with welding, it is impossible to achieve a controlled temperature pattern.

Waste disposal

Providing it has not been contaminated with other substances, Desmopan® can essentially be disposed of in municipal landfills. It does not constitute a hazard to water. If the material can no longer be recycled, it makes sense to incinerate it in a waste incinerator on account of its high calorific value.

Recycling

Molded parts of Desmopan® must be labeled in line with DIN/ISO 11469 and ISO 11469:

›TPU‹

All Desmopan® grades can be remelted in a stable manner and can thus be reused in the recycling process (always predried).

Injection molding

Sprue and runner waste and other clean waste can be ground and recycled. The ratio of regrind to virgin material should always be selected on the basis of the specifications for the new parts. A knowledge of the property requirements can also make it possible to decide whether it is possible to use 100 % regrind material. As long as the injection-molded parts are not being used for inferior-quality applications, they must be tested to check that they meet the specified requirements.

Extrusion

Either process separately or add to the injection molding product.

We're there for you – with expertise and commitment all over the world:

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Or visit our additional web site at

www.tpe-u.com

or

www.desmopan.com

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