



# X Durethan®

PRODUCT RANGE WITH REFERENCE DATA

INJECTION MOLDING GRADES

# SEMI-CRYSTALLINE PRODUCTS

## ADVANCED MATERIALS

Durethan® and Pocan® polymers are two product lines that hold a high potential for growth and innovation. Our competitive production facilities and the intensive development work that we have conducted on products and applications have made us into a key supplier in many different markets.

The polymers business is also based on in-house production of the relevant feedstocks required. The production plants for cyclohexanol/cyclohexanone, caprolactam, adipic acid and glass fibers rank amongst the biggest of their kind.

## MAIN SECTOR

Durethan® has a property profile that makes it ideal for applications in the automotive and electrical/electronics industries and in the construction sector. Pocan® is used primarily in the electrical/electronics industry, although applications for this versatile material are also to be found in the automotive industry, in medicine, and in the sports and leisure sectors.



#### KEY BRANDS AND PRODUCTS

- Durethan®:** Engineering resins based on polyamide 6, polyamide 66 and co-polyamides
- Pocan®:** Engineering resins based on polybutylene terephthalate
- Sites:** Uerdingen (Germany)  
Hamm-Uentrop (Germany)  
Wuxi (China)



# RANGE OF GRADES

DURETHAN® FOR INJECTION MOLDING

## PA 6 AND CO-POLYAMIDES

### NON-REINFORCED

<b>Basic Grades</b>	B 30 S	standard grade, low viscosity
	B 31 SK	low viscosity, fast cycle
	B 36 ASK	medium viscosity
	B 40 SK *	high viscosity
<b>Enhanced Impact Resistance</b>	BC 30	enhanced impact resistance compared to B 30 S
	BC 304	medium impact resistance
	BC 40 SR2	high impact resistance
	DP 1336	high impact resistance

### REINFORCED/FILLED

<b>Basic Grades</b>	BKV 15 H2.0 *	15 % glass fibers
	BKV 30 H2.0 *	30 % glass fibers
	BKV 35 H2.0 *	35 % glass fibers
	BKV 50 H2.0 *	50 % glass fibers
	BM 130 H2.0	30 % mineral
	BM 230 H2.0 *	30 % mineral
	BM 240 H2.0 *	40 % mineral
	BM 29 X H1.0 *	30 % glass fibers and mineral
	BM 40 X H2.0 DUS 009	40 % glass fibers and mineral
	BG 30 X *	30 % glass fibers and glass beads
<b>Improved Flowability</b>	BKV 30 EF *	30 % glass fibers, easy flow
	DP BKV 30 XF	30 % glass fibers, extreme flow
	BKV 35 H2.0 EF	35 % glass fibers, easy flow
	DP BKV 35 XF	35 % glass fibers, extreme flow
	BKV 50 H2.0 EF	50 % glass fibers, easy flow
	DP BKV 60 H2.0 EF	60 % glass fibers, easy flow
	DP BM 29 X H2.0 EF	30 % glass fibers and mineral, easy flow
	DP 1441/40 H2.0 EF	40 % glass fibers and mineral, easy flow
<b>Improved Impact Resistance</b>	BKV 115 *	15 % glass fibers, high impact resistance
	BKV 130 *	30 % glass fibers, high impact resistance
	BKV 140 *	40 % glass fibers, high impact resistance
	BKV 215 *	15 % glass fibers, highest impact resistance
	BKV 230 *	30 % glass fibers, highest impact resistance
DP BKV 240 H2.0	40 % glass fibers, highest impact resistance	
<b>Improved Surface Finish</b>	BKV 15 G H2.0	15 % glass fibers, improved surface finish, CaCl <sub>2</sub> -resistance
	BKV 30 G H2.0	30 % glass fibers, improved surface finish, CaCl <sub>2</sub> -resistance
	DP 1100/30 H2.0	30 % micro glass beads, improved surface finish
<b>Improved Heat Stabilization</b>	BKV 30 HTS	30 % glass fibers
	BKV 35 HTS	35 % glass fibers
<b>GIT/WIT</b>	BKV 130 GIT	30 % glass fibers
<b>Improved Welding Performance</b>	BKV 330 H2.0	30 % glass fibers

### PA 6I

<b>Transparent</b>	T 40	non-reinforced
	T 40 ZS	non-reinforced, easy release

## PA 66

### NON-REINFORCED

<b>Basic Grades</b>	A 30	standard grade, low viscosity
	A 30 S *	standard grade, low viscosity, easy release
<b>Enhanced Impact Resistance</b>	AC 30 *	enhanced impact resistance compared to A 30 S
	DP 2325 H3.0	medium impact resistance

### REINFORCED/FILLED

<b>Basic Grades</b>	AKV 15 H2.0 *	15 % glass fibers
	AKV 30 H2.0 *	30 % glass fibers
	AKV 35 H2.0 *	35 % glass fibers
	AKV 50 H2.0 *	50 % glass fibers
	AM 230 H2.0	30 % mineral
	AM 140 H2.0	40 % mineral
	KL 1-2403/40 H1.0	40 % mineral
	KL 1-2218/40 H2.0	40 % glass fibers and mineral
<b>Improved Flowability</b>	DP AKV 30 HR EF	30 % glass fibers, easy flow
<b>Improved Surface Finish</b>	AKV 30 G H2.0 SR1	30 % glass fibers, good surface finish
<b>GIT/WIT</b>	AKV 30 GIT	30 % glass fibers
	DP AKV 30 X HR	30 % glass fibers mixture
	DP 2-2224/30 H2.0	30 % glass fibers and mineral
<b>Improved Hydrolysis Resistance</b>	AKV 30 HR H2.0	30 % glass fibers
	DP AKV 30 HR EF	30 % glass fibers, easy flow
	DP AKV 30 X HR	30 % glass fiber mixture

## PA 6 AND CO-POLYAMIDES, FLAME RETARDANT

### NON-REINFORCED

<b>Halogen-free</b>	KU 2-2183	UL94V-2 (0.75 mm)
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### REINFORCED

<b>Halogen-free</b>	DP 1801/30 H3.0	30 % glass fibers, UL94V-2 (0.75 mm)
	DP 1803/10 H3.0	50 % glass fibers and mineral, UL94V-2 (0.75 mm)
	KU 2-2184/15 H3.0	65 % glass fibers and mineral, UL94V-0 (1.2 mm)
<b>Halogen</b>	DP 1852/30	30 % glass fibers, UL94V-0 (1.5 mm)

## PA 66, FLAME RETARDANT

### NON-REINFORCED

<b>Halogen-free</b>	DP 2801	UL94V-2 (0.75 mm)
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### REINFORCED

<b>Halogen-free</b>	DP 2802/30	30 % glass fibers, UL94V-2 (0.75 mm)
	DP 2-2851/30 H3.0	30 % glass fibers, UL94V-0 (0.75 mm)

### STABILIZATIONS

<b>H1.0</b>	Heat stabilization for natural and light colors
<b>H2.0</b>	Heat stabilization for black and dark colors
<b>H3.0</b>	Special heat stabilization for E/E applications
<b>HTS</b>	Special heat stabilization for high long-term temperatures
<b>W, W1</b>	Light and weather (UV) stabilization

\* also available with heat stabilization or with other than mentioned stabilization



# REFERENCE DATA

PROPERTIES	UNITS	TEST CONDITIONS	STANDARDS
<b>COLOR</b>			
<b>BRIEF DESCRIPTION</b>			
<b>MECHANICAL PROPERTIES (23 °C/50 % R.H.)</b>			
Tensile modulus	MPa	1 mm/min	ISO 527-1,-2
Yield stress	MPa	50 mm/min	ISO 527-1,-2
Yield strain	%	50 mm/min	ISO 527-1,-2
Nominal strain at break	%	50 mm/min	ISO 527-1,-2
Stress at break	MPa	5 mm/min	ISO 527-1,-2
Strain at break	%	5 mm/min	ISO 527-1,-2
Flexural modulus	MPa	2 mm/min	ISO 178
Flexural strength	MPa	2 mm/min	ISO 178
Flexural strain at flexural strength	%	2 mm/min	ISO 178
Flexural stress at 3.5 % strain	MPa	2 mm/min	ISO 178
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	+23 °C	ISO 179-1eU
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	-30 °C	ISO 179-1eU
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	+23 °C	ISO 179-1eA
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>	-30 °C	ISO 179-1eA
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>	-40 °C	ISO 179-1eA
Izod impact strength 23 °C	kJ/m <sup>2</sup>	+23 °C	ISO 180-1U
Izod impact strength -30 °C	kJ/m <sup>2</sup>	-30 °C	ISO 180-1U
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	+23 °C	ISO 180-1A
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>	-30 °C	ISO 180-1A
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>	-40 °C	ISO 180-1A
Ball indentation hardness	N/mm <sup>2</sup>		ISO 2039-1
<b>THERMAL PROPERTIES</b>			
Melting temperature	°C	10 °C/min	ISO 11357-1,-3
Temperature of deflection under load HDT, method Af	°C	1.80 MPa	ISO 75-1,-2
Temperature of deflection under load HDT, method Bf	°C	0.45 MPa	ISO 75-1,-2
Temperature of deflection under load HDT, method Cf	°C	8.00 MPa	ISO 75-1,-2
Vicat softening temperature, B50	°C	50 N; 50 °C/h	ISO 306
Vicat softening temperature, B120	°C	50 N; 120 °C/h	ISO 306
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	23 to 55 °C	ISO 11359-1,-2
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	23 to 55 °C	ISO 11359-1,-2
Resistance to heat (ball pressure test)	°C	-	IEC 60695-10-2
Burning behavior UL 94 (UL Yellow Card)	Classification	(mm)	UL 94
Oxygen index	%	Method A	ISO 4589-2
Glow Wire Flammability Index (GWFI)	°C	(mm)	IEC 60695-2-12
Glow Wire Ignition Temperature (GWIT)	°C	(mm)	IEC 60695-2-13
<b>ELECTRICAL PROPERTIES (23 °C/50 % R.H.)</b>			
Relative permittivity; 100 Hz	-	100 Hz	IEC 60250
Relative permittivity; 1 MHz	-	1 MHz	IEC 60250
Dissipation factor; 100 Hz	10 <sup>-4</sup>	100 Hz	IEC 60250
Dissipation factor; 1 MHz	10 <sup>-4</sup>	1 MHz	IEC 60250
Volume resistivity	Ohm		IEC 60093
Surface resistivity	Ohm		IEC 60093
Electric strength	kV/mm	1 mm	IEC 60243-1
Comparative tracking index CTI	Rating	Test solution A	IEC 60112
Comparative tracking index CTI M	Rating	Test solution B	IEC 60112
<b>OTHER PROPERTIES (23 °C)</b>			
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min	260 °C; 5 kg *	ISO 1133
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min	280 °C; 5 kg *	ISO 1133
Molding shrinkage, parallel; 150x105x3	%	150x105x3	acc. ISO 2577
Molding shrinkage, across; 150x105x3	%	150x105x3	acc. ISO 2577
Mold 80 °C; melt temperature/back pressure	°C/bar	Melt temperature/back pressure	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	150x105x3; 120 °C; 4 h *	acc. ISO 2577
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	150x105x3; 120 °C; 4 h *	acc. ISO 2577
Molding shrinkage, parallel; 60x60x2	%	60x60x2	ISO 294-4
Molding shrinkage, across; 60x60x2	%	60x60x2	ISO 294-4
Mold 80 °C; melt temperature/back pressure	°C/bar	Melt temperature/back pressure	
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%	60x60x2; 120 °C; 4 h *	ISO 294-4
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%	60x60x2; 120 °C; 4 h *	ISO 294-4
Water absorption (saturation value)	%	Water at 23 °C	ISO 62
Water absorption (equilibrium value)	%	23 °C; 50 % r.h.	ISO 62
Glass fiber/glass bead/filler content	%	-	ISO 3451-1
Density	kg/m <sup>3</sup>	-	ISO 1183
<b>PROCESSING CONDITIONS FOR TEST SPECIMENS</b>			
Injection molding – melt temperature	°C	-	ISO 294
Injection molding – mold temperature	°C	-	ISO 294

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\* deviant figures in parenthesis

N = no failure

Conditioning in accordance with ISO 1110 (70 °C; 62 % r.h.)

## PA 6 AND CO-POLYAMIDES

## NON-REINFORCED

## BASIC GRADES

B 30 S 000000 standard grade, low viscosity		B 31 SK 000000 low viscosity, fast cycle		B 36 ASK 000000 medium viscosity		B 40 SK 000000 high viscosity	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
3200	1000	3500	1100	3200	900	3200	900
80	40	85	50	80	45	85	40
4.0	20	4.0	20	4.0	20	4.0	25
20	> 50	10	> 50	20	> 50	20	> 50
2900	850	3000	900	2800	800	2800	800
110	35	120	40	110	35	115	35
6.0	8.0	6.0	8.0	5.5	8.5	6.0	9.0
95	25	100	30	100	30	95	25
N	N	N	N	N	N	N	N
N	N	N	N	N	N	N	N
< 10	20	< 10	25	< 10	40	< 10	50
< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
		< 10	< 10	< 10	< 10	< 10	< 10
N	N	115	N	N	N	N	N
N	N	116	N	N	N	N	N
< 10	< 10	< 10	< 10				
		< 10	< 10	< 10	< 10	< 10	< 10
				< 10	< 10	< 10	< 10
140	50	150	55	135	45	150	50
222		222		222		222	
-55		-60		-58		-55	
-160		-170		-170		-150	
-45		-50		-48		-45	
-200		-200		-200		-200	
-200		-200		-200		-200	
1.0		0.7		0.7		0.8	
1.1		0.9		0.8		0.9	
210		196		195			
V-2 (0.38)		V-2 (0.38)		HB (1.5)		HB (1.5)	
26		25		25		24	
750 (2.0)		750 (2.0)		750 (2.0)		750 (2.0)	
4	15	4	13	4	15	4	20
3.5	4	3.5	4	3.5	4	3.5	4.5
170	2000	60	1900	75	1650	120	1850
200	1200	200	1000	200	1200	200	1350
1E13	1E10	1E13	1E10	1E12	1E11	1E13	1E09
1E14	1E13	1E15	1E14	1E15	1E11	1E14	1E13
30	30	30	30	30	30	30	35
600 - 1.3		600		600		600	
600 M		525 (450) M		600 (500) M		600 (457) M	
110		110					
1.02		0.90		0.78		0.90	
1.16		1.1		0.85		0.96	
280/500		280/400		280/500		280/500	
0.32		0.15		0.26		0.21	
0.40		0.15		0.25		0.20	
-10		-10		-10		-10	
-3		-3		-3		-3	
1140		1140		1140		1140	
260		260		260		260	
80		80		80		80	

# REFERENCE DATA

## PA 6 AND CO-POLYAMIDES

### PROPERTIES<sup>1</sup>

### UNITS

### COLOR

### BRIEF DESCRIPTION

### NON-REINFORCED

### ENHANCED IMPACT RESISTANCE

		BC 30 000000		BC 304 000000	
		enhanced impact resistance compared to B 30 S		medium impact resistance	
		dry as molded	conditioned	dry as molded	conditioned
<b>MECHANICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Tensile modulus	MPa	2800	1200	1800	800
Yield stress	MPa	65	40	45	35
Yield strain	%	4.0	20	4.5	30
Nominal strain at break	%	> 10	> 50	> 50	> 50
Stress at break	MPa				
Strain at break	%				
Flexural modulus	MPa	2400	800	1600	700
Flexural strength	MPa	90	30	60	30
Flexural strain at flexural strength	%	7.0	9.0	7.0	9.0
Flexural stress at 3.5 % strain	MPa	75	20	55	25
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	N	N	N	N
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	N	N	N	N
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	10	50	85	120
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>	< 10	< 10	20	20
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>				
Izod impact strength 23 °C	kJ/m <sup>2</sup>				
Izod impact strength -30 °C	kJ/m <sup>2</sup>				
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	< 10	50	70	100
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>	< 10	< 10	30	17
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	110	45	80	35
<b>THERMAL PROPERTIES</b>					
Melting temperature	°C	222		222	
Temperature of deflection under load HDT, method Af	°C	~50		~50	
Temperature of deflection under load HDT, method Bf	°C	~135		~90	
Temperature of deflection under load HDT, method Cf	°C	~45		~40	
Vicat softening temperature, B50	°C	~180		~150	
Vicat softening temperature, B120	°C	~180		~150	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	1.0		1.5	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	1.1		1.6	
Resistance to heat (ball pressure test)	°C			194	
Burning behavior UL 94 (UL Yellow Card)	Classification	HB (0.75)			
Oxygen index	%	22		21	
Glow Wire Flammability Index (GWFI)	°C	800 (2.0)		650 (2.0)	
Glow Wire Ignition Temperature (GWIT)	°C				
<b>ELECTRICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Relative permittivity; 100 Hz	-	3.7	8.5	3.3	11
Relative permittivity; 1 MHz	-	3.3	3.8	3	3.5
Dissipation factor; 100 Hz	10 <sup>-4</sup>	110	1650	70	1750
Dissipation factor; 1 MHz	10 <sup>-4</sup>	190	660	150	900
Volume resistivity	Ohm	1E13	1E11	1E13	1E10
Surface resistivity	Ohm	1E15	1E14	1E15	1E14
Electric strength	kV/mm	35	35	35	35
Comparative tracking index CTI	Rating	600		600 - 1.7	
Comparative tracking index CTI M	Rating	600 M		600 M - 2.3	
<b>OTHER PROPERTIES (23 °C)</b>					
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min	100			
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min				
Molding shrinkage, parallel; 150x105x3	%	1.05		1.14	
Molding shrinkage, across; 150x105x3	%	1.57		1.45	
Mold 80 °C; melt temperature/back pressure	°C/bar	260/400		260/500	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.35		0.38	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.44		0.46	
Molding shrinkage, parallel; 60x60x2	%				
Molding shrinkage, across; 60x60x2	%				
Mold 80 °C; melt temperature/back pressure	°C/bar				
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%				
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%				
Water absorption (saturation value)	%	~9		~7.5	
Water absorption (equilibrium value)	%	~2.7		~2.2	
Glass fiber/glass bead/filler content	%				
Density	kg/m <sup>3</sup>	1100		1060	
<b>PROCESSING CONDITIONS FOR TEST SPECIMENS</b>					
Injection molding – melt temperature	°C	260		260	
Injection molding – mold temperature	°C	80		60	

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure



## DURETHAN®

## PA 6 AND CO-POLYAMIDES

## PA 6 AND CO-POLYAMIDES

## NON-REINFORCED

## REINFORCED/FILLED

## ENHANCED IMPACT RESISTANCE

## BASIC GRADES

BC 40 SR2 000000 high impact resistance		DP 1336 901510 high impact resistance		BKV 15 H2.0 901510 15 % glass fibers		BKV 30 H2.0 901510 30 % glass fibers	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
2700	1200	2100		5300	2500	9500	5900
70	40	55					
4.0	30	4.0					
> 20	> 50	> 50					
				125	60	170	100
				2.5	15	3	6
2400	800	1900		4700	2500	8300	5000
90	30	70		180	90	270	160
7.0	9.0	6.0		4.0	7.0	4.0	6.0
80	20	60		170	70	260	140
N	N	N	N	50	90	70	90
N	N	N	N	40	45	60	60
20	100	80	100	< 10	< 10	10	20
15	15			< 10	< 10	< 10	10
				< 10	< 10		
				30	75	60	80
				30	35	55	55
18	100	70	100	< 10	< 10	< 10	< 10
				< 10	< 10		
110	45	85	30	170	80	210	100
222		222		213		222	
~50		~50		~190		~200	
~130		~130		~210		~215	
~45		~40		~60		~110	
~180				200		200	
~180				> 200		> 200	
0.9				0.3		0.2	
1.0				0.8		1.0	
						212	
		HB (0.75)		HB (0.75)		HB (0.75)	
21				22		22	
750 (2.0)		650 (2.0)		650 (2.0)		600 (2.0)	
4	14					4.2	12
3.3	4					3.8	4.4
125	1900					100	2550
200	900					170	780
1E13	1E10					1E13	1E10
1E15	1E13					1E14	1E13
35	30					40	35
600				375 – 1.6		425 – 0.1	
600						300 (200) M – 1.4	
30						16	
1.23		1.10		0.29		0.18	
1.65		1.09		0.88		0.85	
260/400		260/500		280/500		280/500	
0.17		0.62		0.08		0.04	
0.25		0.60		0.21		0.11	
						0.30	
						0.69	
						280/600	
						0.06	
						0.13	
~9				~8.5		~7.0	
~2.7				~2.6		~2.1	
				15		30	
1100		1060		1230		1372	
260		260		280		280	
80		45		80		80	

# REFERENCE DATA

## PA 6 AND CO-POLYAMIDES

### PROPERTIES<sup>1</sup>

### UNITS

### REINFORCED/FILLED

### BASIC GRADES

### COLOR

### BRIEF DESCRIPTION

BKV 35 H2.0  
901510  
35 % glass fibers

BKV 50 H2.0  
901510  
50 % glass fibers

dry as molded | conditioned | dry as molded | conditioned

### MECHANICAL PROPERTIES (23 °C/50 % R.H.)

Property	Unit	dry as molded	conditioned	dry as molded	conditioned
Tensile modulus	MPa	10700	6800	16300	9800
Yield stress	MPa				
Yield strain	%				
Nominal strain at break	%				
Stress at break	MPa	180	110	220	140
Strain at break	%	3	5	3	5
Flexural modulus	MPa	9400	5900	14800	9700
Flexural strength	MPa	300	180	360	230
Flexural strain at flexural strength	%	4.0	5.0	3.0	5.0
Flexural stress at 3.5 % strain	MPa	280	160		
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	80	90	90	100
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	70	70	80	80
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	12	20	20	25
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>	< 10	10	13	13
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>				
Izod impact strength 23 °C	kJ/m <sup>2</sup>	75	85	75	85
Izod impact strength -30 °C	kJ/m <sup>2</sup>	65	65	75	70
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	12	20	20	25
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>	< 10	10	12	12
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>			250	109

### THERMAL PROPERTIES

Property	Unit	BKV 35 H2.0	BKV 50 H2.0
Melting temperature	°C	222	222
Temperature of deflection under load HDT, method Af	°C	-205	-205
Temperature of deflection under load HDT, method Bf	°C	-215	-215
Temperature of deflection under load HDT, method Cf	°C	-150	-175
Vicat softening temperature, B50	°C	200	> 200
Vicat softening temperature, B120	°C	> 200	> 200
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.2	0.2
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.8	0.7
Resistance to heat (ball pressure test)	°C		
Burning behavior UL 94 (UL Yellow Card)	Classification	HB (1.5)	HB (0.75)
Oxygen index	%	23	24
Glow Wire Flammability Index (GWFI)	°C	650 (2.0)	650 (2.0)
Glow Wire Ignition Temperature (GWIT)	°C		

### ELECTRICAL PROPERTIES (23 °C/50 % R.H.)

Property	Unit	BKV 35 H2.0	BKV 50 H2.0
Relative permittivity; 100 Hz	-		
Relative permittivity; 1 MHz	-		
Dissipation factor; 100 Hz	10 <sup>-4</sup>		
Dissipation factor; 1 MHz	10 <sup>-4</sup>		
Volume resistivity	Ohm		
Surface resistivity	Ohm		
Electric strength	kV/mm		
Comparative tracking index CTI	Rating	475	550
Comparative tracking index CTI M	Rating		

### OTHER PROPERTIES (23 °C)

Property	Unit	BKV 35 H2.0	BKV 50 H2.0
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min		
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min		
Molding shrinkage, parallel; 150x105x3	%	0.16	0.16
Molding shrinkage, across; 150x105x3	%	0.81	0.85
Mold 80 °C; melt temperature/back pressure	°C/bar	280/500	280/400
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.03	0.02
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.10	0.05
Molding shrinkage, parallel; 60x60x2	%		
Molding shrinkage, across; 60x60x2	%		
Mold 80 °C; melt temperature/back pressure	°C/bar		
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%		
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%		
Water absorption (saturation value)	%	~6.5	~5.0
Water absorption (equilibrium value)	%	~1.9	~1.5
Glass fiber/glass bead/filler content	%	35	50
Density	kg/m <sup>3</sup>	1410	1570

### PROCESSING CONDITIONS FOR TEST SPECIMENS

Property	Unit	BKV 35 H2.0	BKV 50 H2.0
Injection molding – melt temperature	°C	290	290
Injection molding – mold temperature	°C	80	80

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure

## PA 6 AND CO-POLYAMIDES

## REINFORCED/FILLED

## BASIC GRADES

BM 130 H2.0 901510 30 % mineral		BM 230 H2.0 901510 30 % mineral		BM 240 H2.0 901510 40 % mineral		BM 29 X H1.0 000000 30 % glass fiber + mineral	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
7000	2800	5000	2000	6000	2200	6100	2900
75	40	80	50	85	50	110	60
3	40	10	45	7	40	4	20
6900	2600	4700	1800	5700	2100	5700	2600
120	50	140	60	150	60	180	90
3.0	8.0	5.5	8.0	5.0	8.0	5.0	8.0
	45	130	55	140	50	170	70
35	100	120	N	120	N	40	120
45	45	80	80	90	90	40	40
< 10	< 10	< 10	13	< 10	12	< 10	< 10
< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
37	112	122	N	100	N	35	N
30	35	80	95	75	85	35	40
< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
160	70	180	80	210	90	195	80
222		222		222		222	
-120		-70		-90		-190	
-200		-185		-190		-200	
-50		-50		-50		-60	
> 200		200		200			
> 200		> 200		> 200		> 200	
0.4		0.7		0.8			
0.6		0.9		0.9			
26		25		26		22	
650 (2.0)		650 (2.0)		700 (2.0)		700 (2.0)	
4	11	4.3	16	4.4	15		
3.5	4	3.9	4.7	4	4.7		
100	2200	80	3250	110	2500		
170	800	180	1100	150	1000		
1E13	1E10	1E12	1E10	1E13	1E09		
1E15	1E13	1E16	1E13	1E15	1E13		
30	30	29	27	35	38		
500		525 (475) - 0.5		525 - 0.4		500	
400 (325) M		200 M - 0.3		375 - 1.3			
				18			
0.48		1.08		1.25		0.49	
0.60		1.12		1.22		0.89	
280/400		280/500		280/500		280/500	
0.12		0.32		0.17		0.06	
0.12		0.30		0.20		0.08	
						0.51	
						0.56	
						280/600	
						0.16	
						0.13	
-7.0		-7.0		-6.0		-7.0	
-2.1		-2.2		-1.9		-2.2	
30		30		40		30	
1360		1360		1460		1360	
280		280		290		280	
80		80		80		80	

# REFERENCE DATA

## PA 6 AND CO-POLYAMIDES

### PROPERTIES<sup>1</sup>

### UNITS

### REINFORCED/FILLED

### BASIC GRADES

### COLOR

### BRIEF DESCRIPTION

BM 40 X H2.0 DUS009  
901510  
40 % glass fiber + mineral

BG 30 X  
000000  
30 % glass fiber + glass beads

dry as molded | conditioned | dry as molded | conditioned

### MECHANICAL PROPERTIES (23 °C/50 % R.H.)

Property	Unit	BM 40 X H2.0 DUS009 901510 40 % glass fiber + mineral	BG 30 X 000000 30 % glass fiber + glass beads
Tensile modulus	MPa	8000	6400
Yield stress	MPa		3200
Yield strain	%		
Nominal strain at break	%		
Stress at break	MPa	120	125
Strain at break	%	2.8	4
Flexural modulus	MPa	7500	5800
Flexural strength	MPa	193	195
Flexural strain at flexural strength	%	3.6	5.0
Flexural stress at 3.5 % strain	MPa	193	175
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	45	50
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	40	45
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>		< 10
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>		< 10
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>		< 10
Izod impact strength 23 °C	kJ/m <sup>2</sup>	35	35
Izod impact strength -30 °C	kJ/m <sup>2</sup>	35	30
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	< 10	< 10
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>		< 10
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>		< 10
Ball indentation hardness	N/mm <sup>2</sup>	213	185

### THERMAL PROPERTIES

Melting temperature	°C	221	222
Temperature of deflection under load HDT, method Af	°C	190	-190
Temperature of deflection under load HDT, method Bf	°C	215	-210
Temperature of deflection under load HDT, method Cf	°C	80	-60
Vicat softening temperature, B50	°C		> 200
Vicat softening temperature, B120	°C	215	> 200
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.4	0.3
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.8	0.9
Resistance to heat (ball pressure test)	°C		
Burning behavior UL 94 (UL Yellow Card)	Classification	HB (0.75)	HB (0.75)
Oxygen index	%		23
Glow Wire Flammability Index (GWFI)	°C		650 (2.0)
Glow Wire Ignition Temperature (GWIT)	°C		

### ELECTRICAL PROPERTIES (23 °C/50 % R.H.)

Relative permittivity; 100 Hz	-		4.5	16
Relative permittivity; 1 MHz	-		4	4.8
Dissipation factor; 100 Hz	10 <sup>-4</sup>		130	3100
Dissipation factor; 1 MHz	10 <sup>-4</sup>		180	1000
Volume resistivity	Ohm		1E13	1E09
Surface resistivity	Ohm		1E14	1E12
Electric strength	kV/mm		36	30
Comparative tracking index CTI	Rating	425	400 - 1.5	
Comparative tracking index CTI M	Rating		225 M - 1.5	

### OTHER PROPERTIES (23 °C)

Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min	18	30
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min		
Molding shrinkage, parallel; 150x105x3	%	0.43	0.33
Molding shrinkage, across; 150x105x3	%	1.08	0.87
Mold 80 °C; melt temperature/back pressure	°C/bar	290/500	280/500
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.06	0.06
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.06	0.16
Molding shrinkage, parallel; 60x60x2	%	0.51	
Molding shrinkage, across; 60x60x2	%	0.67	
Mold 80 °C; melt temperature/back pressure	°C/bar	290/600	
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%	0.17	
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%	0.15	
Water absorption (saturation value)	%		~7.0
Water absorption (equilibrium value)	%		~2.2
Glass fiber/glass bead/filler content	%	40	30
Density	kg/m <sup>3</sup>	1480	1360

### PROCESSING CONDITIONS FOR TEST SPECIMENS

Injection molding – melt temperature	°C	290	280
Injection molding – mold temperature	°C	80	80

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure



# REFERENCE DATA

## PA 6 AND CO-POLYAMIDES

### PROPERTIES<sup>1</sup>

### UNITS

### REINFORCED/FILLED

### IMPROVED FLOWABILITY

### COLOR

### BRIEF DESCRIPTION

BKV 50 H2.0 EF

900116

50 % glass fiber, easy flow

DP BKV 60 H2.0 EF

900116

60 % glass fiber, easy flow

dry as molded

conditioned

dry as molded

conditioned

### MECHANICAL PROPERTIES (23 °C/50 % R.H.)

Property	Unit	BKV 50 H2.0 EF 900116 50 % glass fiber, easy flow dry as molded	BKV 50 H2.0 EF 900116 50 % glass fiber, easy flow conditioned	DP BKV 60 H2.0 EF 900116 60 % glass fiber, easy flow dry as molded	DP BKV 60 H2.0 EF 900116 60 % glass fiber, easy flow conditioned
Tensile modulus	MPa	16500	10000	18900	13100
Yield stress	MPa				
Yield strain	%				
Nominal strain at break	%				
Stress at break	MPa	225	140	235	150
Strain at break	%	2.3	3.5	2.1	3.1
Flexural modulus	MPa	15200	9900	17200	13100
Flexural strength	MPa	350	230	365	245
Flexural strain at flexural strength	%	3.1	4.4	3.0	4.0
Flexural stress at 3.5 % strain	MPa				
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	95	85	90	90
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	95	85	90	80
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>				
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>				
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>				
Izod impact strength 23 °C	kJ/m <sup>2</sup>	85	80	80	75
Izod impact strength -30 °C	kJ/m <sup>2</sup>	85	80	80	75
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	15	20	15	20
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>				
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	232		255	155

### THERMAL PROPERTIES

Melting temperature	°C	222		222	
Temperature of deflection under load HDT, method Af	°C	213		-215	
Temperature of deflection under load HDT, method Bf	°C	220		-220	
Temperature of deflection under load HDT, method Cf	°C	180		-190	
Vicat softening temperature, B50	°C				
Vicat softening temperature, B120	°C	214		210	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.2		0.2	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.8		0.7	
Resistance to heat (ball pressure test)	°C				
Burning behavior UL 94 (UL Yellow Card)	Classification			HB (0.75)	
Oxygen index	%				
Glow Wire Flammability Index (GWFI)	°C				
Glow Wire Ignition Temperature (GWIT)	°C				

### ELECTRICAL PROPERTIES (23 °C/50 % R.H.)

Relative permittivity; 100 Hz	-	4.7	12.9	5.3	11.2
Relative permittivity; 1 MHz	-	4.2	4.8	4.7	5.1
Dissipation factor; 100 Hz	10 <sup>-4</sup>	135	2622	164	2149
Dissipation factor; 1 MHz	10 <sup>-4</sup>	170	774	177	651
Volume resistivity	Ohm	7E12	4E9	5.8E12	8E9
Surface resistivity	Ohm				
Electric strength	kV/mm	35	34	33	33
Comparative tracking index CTI	Rating	400		600 - < 1	
Comparative tracking index CTI M	Rating	250 M		250 M - < 1	

### OTHER PROPERTIES (23 °C)

Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min	23 (270/5)		10 (270/5)	
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min				
Molding shrinkage, parallel; 150x105x3	%	0.16		0.19	
Molding shrinkage, across; 150x105x3	%	0.61		0.55	
Mold 80 °C; melt temperature/back pressure	°C/bar	280/500		280/500	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.03		0.03	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.08		0.02	
Molding shrinkage, parallel; 60x60x2	%	0.19		0.19	
Molding shrinkage, across; 60x60x2	%	0.51		0.47	
Mold 80 °C; melt temperature/back pressure	°C/bar	280/600		280/600	
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%	0.04		0.02	
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%	0.09		0.09	
Water absorption (saturation value)	%			-4.2	
Water absorption (equilibrium value)	%			-1.2	
Glass fiber/glass bead/filler content	%	50		60	
Density	kg/m <sup>3</sup>	1570		1690	

### PROCESSING CONDITIONS FOR TEST SPECIMENS

Injection molding – melt temperature	°C	280		280	
Injection molding – mold temperature	°C	80		80	

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<sup>1</sup> See page 1 of the table for test conditions and standards

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## PA 6 AND CO-POLYAMIDES

## REINFORCED/FILLED

IMPROVED FLOWABILITY				ENHANCED IMPACT RESISTANCE			
DP BM 29 X H2.0 EF 900116 30 % glass fiber + mineral, easy flow		DP 1441/40 H2.0 EF 900116 40 % glass fiber + mineral, easy flow		BKV 115 000000 15 % glass fiber, high impact resistance		BKV 130 000000 30 % glass fiber, high impact resistance	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
6200		8500	4500	5700	2800	9000	5200
110		135	65	120	65	160	100
2.7		2.8	8.7	4	12	4	7
5700		8100	4250	5000	2500	8000	4800
180		220	125	185	95	250	145
4.5		3.5	6.2	5.0	8.0	5.0	7.0
165		220	110	165	70	230	115
40	110	40	65	65	80	95	110
35	35	40	45	45	40	80	80
		5	8	< 10	20	18	28
				< 10	< 10	10	10
				< 10	< 10		
30	95	30	60	60	50	70	75
25	30	30	30	40	40	80	60
< 10	< 10	5	10			16	25
< 10	< 10			< 10	< 10	10	10
				< 10	< 10		
189		210	95	160		190	80
222		222		213		213	
180		200		~190		~200	
200		215		~205		~210	
				-60		-90	
				~200		> 200	
> 200				~200		> 200	
0.4		0.3		0.3		0.2	
0.8				1.0		1.0	
	0.9						
				22		22	
				650 (2.0)		650 (2.0)	
				4.1	8	4.2	13
				3.7	4.8	3.8	4.6
				80	2150	90	1750
				200	1300	200	900
				1E13	1E10	1E13	1E10
				1E14	1E13	1E15	1E13
				35	35	40	40
425				600 - 0.6		575	
				475 (300) M - 2.0		525 M	
		60 (270/5)		28		11	
		0.25		0.26		0.16	
		0.87		0.71		0.72	
		290/500		280/500		280/500	
		0.05		0.07		0.04	
		0.15		0.16		0.15	
0.24				0.38			
0.36				0.51			
280/600				280/600			
0.13				0.11			
0.15				0.13			
~7.0				~8.5		~7	
~2.2				~2.5		~2.0	
30		40		15		30	
1360		1440		1230		1360	
280		290		280		280	
80		80		80		80	

# REFERENCE DATA

## PA 6 AND CO-POLYAMIDES

PROPERTIES <sup>1</sup>	UNITS	REINFORCED/FILLED			
		ENHANCED IMPACT RESISTANCE			
COLOR		BKV 140 000000 40 % glass fiber, high impact resistance		BKV 215 000000 15 % glass fiber, highest impact resistance	
BRIEF DESCRIPTION		dry as molded	conditioned	dry as molded	conditioned
<b>MECHANICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Tensile modulus	MPa	11500	6700	4600	2400
Yield stress	MPa				
Yield strain	%				
Nominal strain at break	%				
Stress at break	MPa	180	120	90	55
Strain at break	%	3	6	4.5	15
Flexural modulus	MPa	10400	6200	4000	2200
Flexural strength	MPa	295	175	140	80
Flexural strain at flexural strength	%	4.0	6.0	5.0	7.0
Flexural stress at 3.5 % strain	MPa	280	145	125	60
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	100	110	70	80
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	95	95	80	75
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	25	30	20	35
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>	10	10	12	12
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>				
Izod impact strength 23 °C	kJ/m <sup>2</sup>	80	90		
Izod impact strength -30 °C	kJ/m <sup>2</sup>	75	75		
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	20	30	18	30
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>	16	16	10	10
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	200		110	55
<b>THERMAL PROPERTIES</b>					
Melting temperature	°C	213		213	
Temperature of deflection under load HDT, method Af	°C	~200		~175	
Temperature of deflection under load HDT, method Bf	°C	~210		~205	
Temperature of deflection under load HDT, method Cf	°C			~60	
Vicat softening temperature, B50	°C	> 200		~200	
Vicat softening temperature, B120	°C	> 200		~200	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.2		0.4	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.9		1.5	
Resistance to heat (ball pressure test)	°C				
Burning behavior UL 94 (UL Yellow Card)	Classification				
Oxygen index	%	22		22	
Glow Wire Flammability Index (GWFI)	°C	650 (2.0)		650 (2.0)	
Glow Wire Ignition Temperature (GWIT)	°C				
<b>ELECTRICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Relative permittivity; 100 Hz	-	4	10	3.5	10
Relative permittivity; 1 MHz	-	4	5	3.2	3.7
Dissipation factor; 100 Hz	10 <sup>-4</sup>	70		60	1500
Dissipation factor; 1 MHz	10 <sup>-4</sup>	200		150	800
Volume resistivity	Ohm	1E13	1E09	1E11	1E10
Surface resistivity	Ohm	1E14	1E10	1E15	1E13
Electric strength	kV/mm	40	35	43	43
Comparative tracking index CTI	Rating	575		600 (550)	
Comparative tracking index CTI M	Rating	450 M - 0.6		575 (375) M	
<b>OTHER PROPERTIES (23 °C)</b>					
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min	5			
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min				
Molding shrinkage, parallel; 150x105x3	%	0.16		0.30	
Molding shrinkage, across; 150x105x3	%	0.71		0.83	
Mold 80 °C; melt temperature/back pressure	°C/bar	280/400		280/400	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.03		0.06	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.10		0.15	
Molding shrinkage, parallel; 60x60x2	%				
Molding shrinkage, across; 60x60x2	%				
Mold 80 °C; melt temperature/back pressure	°C/bar				
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%				
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%				
Water absorption (saturation value)	%	~6		~7.0	
Water absorption (equilibrium value)	%	~1.6		~2.0	
Glass fiber/glass bead/filler content	%	40		15	
Density	kg/m <sup>3</sup>	1460		1180	
<b>PROCESSING CONDITIONS FOR TEST SPECIMENS</b>					
Injection molding – melt temperature	°C	290		280	
Injection molding – mold temperature	°C	80		80	

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure

## PA 6 AND CO-POLYAMIDES

## REINFORCED/FILLED

ENHANCED IMPACT RESISTANCE				IMPROVED SURFACE FINISH			
BKV 230 000000 30 % glass fiber, highest impact resistance		DP BKV 240 H2.0 901510 40 % glass fiber, highest impact resistance		BKV 15 G H2.0 901510 15 % glass fibers, improved surface finish, CaCl <sub>2</sub> resistance		BKV 30 G H2.0 900051 30 % glass fibers, improved surface finish, CaCl <sub>2</sub> resistance	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
8300	4700	10500	5700	6500	4000	9500	6200
140	90	150	90	120	70	180	110
4	10	4	7.5	3	11	3	7
7500	4300	9500	5500	5700	3500	8700	5700
230	125	235	135	185	125	250	170
5.0	7.0	4.0	6.0	4.0	7.0	4.0	6.2
210	100	230	115		100		145
95	110	80	95	40	40	75	75
100	100	90		35	35	60	60
25	45	25	35	< 10	< 10	10	13
20	20	15		< 10	< 10	< 10	< 10
				< 10	< 10	< 10	< 10
		80	90	20	35	65	70
		90	80	20	25	50	50
25	35	25	35				
15	15	15	15	< 10	< 10	< 10	< 10
				< 10	< 10	< 10	< 10
165	70			190	95	230	140
213		210		218		221	
~190		195		~180		~195	
~210		210		~210		~215	
		125		~55		~80	
~200				~200		~210	
~200		200		~200		~210	
0.2		0.2		0.3		0.3	
1.3		1.4		0.8		0.8	
HB (0.75)							
				23		23	
650 (2.0)				650 (2.0)		600 (2.0)	
3.8	14			4.1	10	4.3	7
3.6	4.1			3.7	4.3	4.0	4.3
				80	2200	80	1300
				180	700	170	500
1E13	1E09			1E11	1E09	1E13	1E10
1E14	1E12			1E15	1E13	1E15	1E13
40	30			30	30	34	31
		600		375 (325) – 0.5		475	
						225 (175) M	
				42			
0.18		0.19		0.34		0.20	
0.83		0.78		0.67		0.74	
280/400		290/500		280/500		280/500	
0.04		0.15		0.10		0.04	
0.10		0.02		0.21		0.16	
		0.27				0.27	
		0.74				0.58	
		290/600				280/600	
		0.04				0.06	
		0.15				0.16	
~6.0				~7.8		~6.5	
~1.8				~2.6		~1.9	
30		40		15		30	
1320		1410		1240		1360	
280		290		280		280	
80		80		80		80	

# REFERENCE DATA

## PA 6 AND CO-POLYAMIDES

PROPERTIES <sup>1</sup>	UNITS	REINFORCED/FILLED			
		IMPROVED SURFACE FINISH		IMPROVED HEAT STABILIZATION	
COLOR		DP 1100/30 H2.0 901510		BKV 30 HTS 901510	
BRIEF DESCRIPTION		30 % micro beads, improved surface finish		30 % glass fibers	
MECHANICAL PROPERTIES (23 °C/50 % R.H.)		dry as molded	conditioned	dry as molded	conditioned
Tensile modulus	MPa	4300	1350	10000	5200
Yield stress	MPa	80	35		
Yield strain	%	3.5	15		
Nominal strain at break	%				
Stress at break	MPa	75	35	170	75
Strain at break	%	6	155	3	8
Flexural modulus	MPa	3900	1150	8500	4700
Flexural strength	MPa	125	45	275	130
Flexural strain at flexural strength	%	5.0	7.5	4.0	6.0
Flexural stress at 3.5 % strain	MPa	115	30	260	110
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	25	> 150	80	90
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	20	30	70	60
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	3	8	12	15
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>			< 10	< 10
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>				
Izod impact strength 23 °C	kJ/m <sup>2</sup>	20	N	65	60
Izod impact strength -30 °C	kJ/m <sup>2</sup>	20	25	60	40
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	3.5	7.5		
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>			< 10	< 10
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	175	65	210	100
THERMAL PROPERTIES					
Melting temperature	°C			222	
Temperature of deflection under load HDT, method Af	°C	70		-205	
Temperature of deflection under load HDT, method Bf	°C	180		-215	
Temperature of deflection under load HDT, method Cf	°C	50		-110	
Vicat softening temperature, B50	°C				
Vicat softening temperature, B120	°C	205		> 200	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.75		0.2	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.75		0.8	
Resistance to heat (ball pressure test)	°C				
Burning behavior UL 94 (UL Yellow Card)	Classification				
Oxygen index	%			23	
Glow Wire Flammability Index (GWFI)	°C			600 (2.0)	
Glow Wire Ignition Temperature (GWIT)	°C				
ELECTRICAL PROPERTIES (23 °C/50 % R.H.)					
Relative permittivity; 100 Hz	-			4.7	38
Relative permittivity; 1 MHz	-			3.9	5.1
Dissipation factor; 100 Hz	10 <sup>-4</sup>			360	8500
Dissipation factor; 1 MHz	10 <sup>-4</sup>			230	1300
Volume resistivity	Ohm			1E13	4E13
Surface resistivity	Ohm			1E12	9E11
Electric strength	kV/mm			40	35
Comparative tracking index CTI	Rating			425	
Comparative tracking index CTI M	Rating			200	
OTHER PROPERTIES (23 °C)					
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min			8 (270/5)	
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min	85			
Molding shrinkage, parallel; 150x105x3	%	1.07		0.20	
Molding shrinkage, across; 150x105x3	%	1.13		0.85	
Mold 80 °C; melt temperature/back pressure	°C/bar	280/500		280/400	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.31		0.06	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.31		0.08	
Molding shrinkage, parallel; 60x60x2	%				
Molding shrinkage, across; 60x60x2	%				
Mold 80 °C; melt temperature/back pressure	°C/bar				
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%				
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%				
Water absorption (saturation value)	%			~7.0	
Water absorption (equilibrium value)	%			~2.1	
Glass fiber/glass bead/filler content	%	30		30	
Density	kg/m <sup>3</sup>	1351		1360	
PROCESSING CONDITIONS FOR TEST SPECIMENS					
Injection molding – melt temperature	°C	280		280	
Injection molding – mold temperature	°C	80		80	

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure

## DURETHAN®

## PA 6 AND CO-POLYAMIDES

## PA 6I

## REINFORCED/FILLED

IMPROVED HEAT STABILIZATION		GIT/WIT		IMPROVED WELDING PERFORMANCE		TRANSPARENT	
BKV 35 HTS 901510 35 % glass fibers		BKV 130 GIT 900116 30 % glass fibers		BKV 330 H2.0 901510 30 % glass fibers		T 40/T 40 ZS 000000 non-reinforced	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
11500	6300	9400	5300	9700	5600	3000	3300
						110	90
						6.0	5.0
190	85	160	95	170	100		
3	8	3.5	6	3	8		
10000	5400	8600	4700	8300	4900	3000	3300
300	150	250	140	260	150	150	130
4.0	6.0	4.0	7.0	4.5	7.0	7.0	5.0
290	130		110	245	120	105	110
75	85	80	90	80	95	N	N
65	55	70	70	65	65	N	N
15	20	16	25	12	20	< 10	< 10
		10	10	< 10	< 10	< 10	< 10
						< 10	< 10
		75	75	75	85		
		60	50	75	70		
15	20	15	23				
		10	10	< 10	< 10	< 10	< 10
						< 10	< 10
230	120	180		195	95		
222		213		222			
-205		-190		-200		-105	
-215		-210		-215		-115	
-140		-80		-90			
		-200		> 200		-125	
> 200		-200		> 200		-125	
		0.2		0.2			
		0.9		1.0			
				HB (0.75)		V-2 (0.75)	
23		24		23			
		650 (2.0)		700 (2.0)		960 (2.0)	
5		4.5	12	4.5		4.3	4.6
4		4	4.5	3.9		3.8	4
450		70	1600	190		400	480
265		200	900	190		900	1100
7E12		1E13	1E10	1E13		1E13	1E13
1E12		1E15	1E14	1E13		1E15	1E15
		32	32	32		25	28
425		600 - 0.1		450 - 0.3		600	
275 M		400(325) M1 - 1.5		225 M - 1.0			
				1.5			
13							
0.23		0.13		0.23		0.53	
1.00		0.64		0.87		0.49	
280/400		280/400		280/500		280/500	
0.03		0.04		0.04		0.13 (100/4)	
0.08		0.14		0.12		0.09 (100/4)	
6.5		-6.5		-6.5		-6.0	
1.9		-1.9		-2.3		-2.0	
35		30		30			
1410		1360		1360		1180	
280		280		280		270	
80		80		80		80	

# REFERENCE DATA

PA 66

## PROPERTIES<sup>1</sup>

## UNITS

## NON-REINFORCED

## BASIC GRADES

### COLOR

### BRIEF DESCRIPTION

A 30 000000 standard grade, low viscosity		A 30 S 000000 standard grade, low viscosity, easy release	
dry as molded	conditioned	dry as molded	conditioned

### MECHANICAL PROPERTIES (23 °C/50 % R.H.)

		dry as molded	conditioned	dry as molded	conditioned
Tensile modulus	MPa	3200	1300	3600	1600
Yield stress	MPa	85	55	95	60
Yield strain	%	4.5	20	4.5	18
Nominal strain at break	%		> 50		
Stress at break	MPa				
Strain at break	%				
Flexural modulus	MPa	2800	1200	3200	1300
Flexural strength	MPa	125	50	135	60
Flexural strain at flexural strength	%	6.0	8.0	6.0	8.0
Flexural stress at 3.5 % strain	MPa	100	40	110	37
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	N	N	150	N
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	N	N	100	150
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	< 10	20	< 10	12
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>	< 10	< 10	< 10	< 10
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>	< 10	< 10	< 10	< 10
Izod impact strength 23 °C	kJ/m <sup>2</sup>	N	N	90	N
Izod impact strength -30 °C	kJ/m <sup>2</sup>	N	N	75	95
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	< 10	< 10	< 10	< 10
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>	< 10	< 10	< 10	< 10
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	130	70	140	70

### THERMAL PROPERTIES

Melting temperature	°C	263		263	
Temperature of deflection under load HDT, method Af	°C	-70		75	
Temperature of deflection under load HDT, method Bf	°C	-225		214	
Temperature of deflection under load HDT, method Cf	°C	-50		55	
Vicat softening temperature, B50	°C	> 230		> 230	
Vicat softening temperature, B120	°C	> 230		> 230	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.9		0.7	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	1.0		0.8	
Resistance to heat (ball pressure test)	°C			240	
Burning behavior UL 94 (UL Yellow Card)	Classification	V-2 (0.75)		V-2 (0.75)	
Oxygen index	%	27		26	
Glow Wire Flammability Index (GWFI)	°C	750 (2.0)		700 (2.0)	
Glow Wire Ignition Temperature (GWIT)	°C				

### ELECTRICAL PROPERTIES (23 °C/50 % R.H.)

Relative permittivity; 100 Hz	-	3.8	10	3.8	10
Relative permittivity; 1 MHz	-	3.4	4	3.4	4
Dissipation factor; 100 Hz	10 <sup>-4</sup>	90	2000	60	1400
Dissipation factor; 1 MHz	10 <sup>-4</sup>	200	900	180	700
Volume resistivity	Ohm	1E13	1E10	1E13	1E10
Surface resistivity	Ohm	1E15	1E14	1E15	1E14
Electric strength	kV/mm	30	35	30	30
Comparative tracking index CTI	Rating	600 – 2		575 – 1.3	
Comparative tracking index CTI M	Rating	550 (400) M – 3		575 (450) M – 1.9	

### OTHER PROPERTIES (23 °C)

Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min				
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min				
Molding shrinkage, parallel; 150x105x3	%	1.18		0.75	
Molding shrinkage, across; 150x105x3	%	1.95		1.65	
Mold 80 °C; melt temperature/back pressure	°C/bar	280/500		280/400	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.26		0.1	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.36		0.15	
Molding shrinkage, parallel; 60x60x2	%				
Molding shrinkage, across; 60x60x2	%				
Mold 80 °C; melt temperature/back pressure	°C/bar				
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%				
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%				
Water absorption (saturation value)	%	~8.5		~8.5	
Water absorption (equilibrium value)	%	~2.8		~2.8	
Glass fiber/glass bead/filler content	%				
Density	kg/m <sup>3</sup>	1140		1136	

### PROCESSING CONDITIONS FOR TEST SPECIMENS

Injection molding – melt temperature	°C	280	280
Injection molding – mold temperature	°C	80	80

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure



## DURETHAN®

PA 66

PA 66

## NON-REINFORCED

## REINFORCED/FILLED

## ENHANCED IMPACT RESISTANCE

## BASIC GRADES

AC 30  
000000DP 2325 H3.0  
000000AKV 15 H2.0  
901510AKV 30 H2.0  
901510enhanced impact resistance  
compared to A 30 S

medium impact resistance

15 % glass fibers

30 % glass fibers

dry as molded		conditioned		dry as molded		conditioned		dry as molded		conditioned	
2900	1200	1800	700	6300	3800	10000	6000				
80	48	50	30								
5.0	21	21	38								
14	> 50	50	50	3.6		4.4	6.7				
		47	49	125	90	170	110				
		80	290	3	8	3	6				
2400	1000	1660	660	5000	3200	8100	5700				
101	41	65	27	200	110	270	180				
6.7	8.5	6.8	8.7	5.0	8.0	4.0	6.0				
80	30	52	19	175	90		150				
N	N	N	N	40	60	75	85				
N	200	N	N	40	40	60	60				
10	15	50	100	< 10	< 10	< 10	14				
< 10	< 10	20	20	< 10	< 10	< 10	< 10				
< 10	< 10			< 10	< 10	< 10	< 10				
N	N	N	N	30	45	55					
N	N	N	N	30	35	50					
< 10	< 10	80	100	< 10	< 10						
< 10	< 10	25	20	< 10	< 10	< 10	< 10				
						< 10	< 10				
130	70			190	100	220	120				
260		263		263		263					
~70		60		~250		~250					
160		110		~250		~250					
53		50		~70		~135					
> 200		> 200		230		230					
> 200		> 200		> 230		> 230					
0.9		1.3		0.4		0.3					
1.1		1.3		0.9		0.9					
242				248		253					
HB (0.75)				HB (0.75)		HB (0.75)					
21		20		24		23					
750 (2.0)		650 (2.0)		650 (2.0)		600 (2.0)					
3.6	7	3.5	7	4	9	4	12				
3.4	3.8	3	3.4	4	4	4	4				
90	1400	80	1500	90	2200	120	2700				
200	700	150	750	170	700	190	800				
1E13	1E11	1E17	1E15	1E13	1E10	1E13	1E10				
1E15	1E14	1E15	1E14	1E15	1E12	1E15	1E13				
30	30	40	45	35	35	35	30				
600		600 - 1.3		425		475 - 0.3					
550 (450) M											
1.60		2.10		0.55		0.35					
2.20		1.90		1.55		1.27					
280/400		280/500		280/400		290/500					
0.30		0.5		0.05		0.04					
0.20		0.1		0.10		0.07					
		2.1									
		1.6									
		280/600									
		0.5									
		0.2									
-8		~7		~7		~5.5					
~2.5		~2.0		~2.4		~2.0					
				15		30					
1100		1076		1230		1360					
280		280		290		290					
80		80		80		80					

# REFERENCE DATA

PA 66

## PROPERTIES<sup>1</sup>

## UNITS

## REINFORCED/FILLED

## BASIC GRADES

### COLOR

### BRIEF DESCRIPTION

AKV 35 H2.0  
901510  
35 % glass fibers

AKV 50 H2.0  
901510  
50 % glass fibers

dry as molded | conditioned | dry as molded | conditioned

### MECHANICAL PROPERTIES (23 °C/50 % R.H.)

PROPERTY	UNIT	AKV 35 H2.0 901510 35 % glass fibers	AKV 35 H2.0 901510 35 % glass fibers	AKV 50 H2.0 901510 50 % glass fibers	AKV 50 H2.0 901510 50 % glass fibers
		dry as molded	conditioned	dry as molded	conditioned
Tensile modulus	MPa	10600	6800	15300	10200
Yield stress	MPa				
Yield strain	%				
Nominal strain at break	%				
Stress at break	MPa	200	124	230	152
Strain at break	%	3.1	6.4	2.6	4.3
Flexural modulus	MPa	9300	6400	14000	10000
Flexural strength	MPa	300	200	370	240
Flexural strain at flexural strength	%	4.1	6.2	3.0	4.8
Flexural stress at 3.5 % strain	MPa	280	162		216
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	80	90	95	
Charpy impact strength -30 °C	kJ/m <sup>2</sup>	70	75	100	100
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	12	17	19	23
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>	10	10	12	15
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>				
Izod impact strength 23 °C	kJ/m <sup>2</sup>	65		85	85
Izod impact strength -30 °C	kJ/m <sup>2</sup>	55		85	80
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	12	15	15	20
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>	10	10	12	12
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	250	140	246	132

### THERMAL PROPERTIES

Melting temperature	°C	263		261	
Temperature of deflection under load HDT, method Af	°C	250		-250	
Temperature of deflection under load HDT, method Bf	°C	250		-250	
Temperature of deflection under load HDT, method Cf	°C	185		205	
Vicat softening temperature, B50	°C	230		> 230	
Vicat softening temperature, B120	°C	250		> 230	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.3		0.2	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.9		0.8	
Resistance to heat (ball pressure test)	°C	254		258	
Burning behavior UL 94 (UL Yellow Card)	Classification	HB (0.75)		HB (0.75)	
Oxygen index	%	25		27	
Glow Wire Flammability Index (GWFI)	°C	600 (2.0)		600 (2.0)	
Glow Wire Ignition Temperature (GWIT)	°C				

### ELECTRICAL PROPERTIES (23 °C/50 % R.H.)

Relative permittivity; 100 Hz	-	4	10	4.5	14
Relative permittivity; 1 MHz	-	4	4	4	5
Dissipation factor; 100 Hz	10 <sup>-4</sup>	110	2100	90	3200
Dissipation factor; 1 MHz	10 <sup>-4</sup>	150	650	150	850
Volume resistivity	Ohm	1E13	1E10	1E13	1E12
Surface resistivity	Ohm	1E15	1E13	1E13	1E12
Electric strength	kV/mm	35	30	40	35
Comparative tracking index CTI	Rating	425		550 - 0.5	
Comparative tracking index CTI M	Rating	400 M		325 M - 0.3	

### OTHER PROPERTIES (23 °C)

Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min				
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min	27 (290/5)			
Molding shrinkage, parallel; 150x105x3	%	0.32		0.23	
Molding shrinkage, across; 150x105x3	%	1.40		0.90	
Mold 80 °C; melt temperature/back pressure	°C/bar	300/400		300/400	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.03		0.02	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.04		0.04	
Molding shrinkage, parallel; 60x60x2	%	0.37			
Molding shrinkage, across; 60x60x2	%	0.91			
Mold 80 °C; melt temperature/back pressure	°C/bar	300/600			
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%	0.05			
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%	0.07			
Water absorption (saturation value)	%	-5		-4	
Water absorption (equilibrium value)	%	-1.7		-1.4	
Glass fiber/glass bead/filler content	%	35		50	
Density	kg/m <sup>3</sup>	1410		1570	

### PROCESSING CONDITIONS FOR TEST SPECIMENS

Injection molding – melt temperature	°C	300		300	
Injection molding – mold temperature	°C	80		80	

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure

## PA 66

## REINFORCED/FILLED

## BASIC GRADES

AM 230 H2.0 901510 30 % mineral		AM 140 H2.0 901510 40 % mineral		KL 1-2403/40 H1.0 000000 40 % mineral		KL 1-2218/40 H2.0 901510 40 % glass fibers + mineral	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
5100	2300	9100	5100	6300	2700	8000	5000
90	60	75	45	100	65	135	80
5	20	2	9	5	28	3	10
5000	2300	9100	5200	6000	2600	7000	4500
155	75	120	80	165	85	210	120
6.0	8.0	2.0	5.0	5.0	9.0	4.0	7.0
140	60		75	150	65	200	100
100	N	25	30	100	N	40	45
70	70	25	25	85	100	35	35
< 10	< 10	< 10	< 10	< 10	< 10	< 10	
< 10	< 10	< 10	< 10	< 10	< 10	< 10	
< 10	< 10	< 10	< 10	< 10	< 10		
130	N	20	35	100	N		
100	80	25	25	70	70		
< 10	< 10	< 10	< 10	< 10	< 10	< 10	10
< 10	< 10	< 10	< 10	< 10	< 10		
200	100			230	140	230	165
263		263		263		263	
~100		~180		~130		~230	
~230		~250		~235		~250	
~55		~70		~65			
> 230		> 230					
> 230		> 230		> 230		> 230	
0.6		0.5		0.6			
0.8		0.3		0.7			
245		234					
26		30					
650 (2.0)		650 (2.0)		650 (2.0)			
4.2	11	4	8	4	10	5	10
3.8	4.4	4	4	4	5	4	4
100	2250	100	1800	100		80	1300
170	750	150	550	150	1500	150	700
1E13	1E09	1E13	1E10	1E13	1E09	1E13	1E10
1E14	1E12	1E15	1E13	1E14	1E12	1E14	1E12
30	30	35	30	35	35	40	35
575		600		600 - 0.9		400	
425 M		425 M		400 M		275 M	
				31			
1.43		0.50		1.50		0.70	
1.44		0.60		1.40		1.30	
280/500		280/400		300/400		280/400	
0.22		0.10		0.20		0.10	
0.12		0.05		0.10		0.10	
~5.5		~5		~4.5		~4.5	
~2.0		~1.4		~1.7		~1.5	
30		40		40		40	
1360		1460		1446		1460	
290		300		300		300	
80		80		80		80	

# REFERENCE DATA

PA 66

PROPERTIES <sup>1</sup>	UNITS	REINFORCED/FILLED			
		IMPROVED FLOWABILITY		IMPROVED SURFACE FINISH	
COLOR		DP AKV 30 HR EF 901510		AKV 30 G H2.0 SR1 900051	
BRIEF DESCRIPTION		30 % glass fibers, easy flow		30 % glass fibers, good surface finish	
		dry as molded	conditioned	dry as molded	conditioned
<b>MECHANICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Tensile modulus	MPa	8800	5300	9600	6600
Yield stress	MPa				
Yield strain	%				
Nominal strain at break	%				
Stress at break	MPa	155	100	180	120
Strain at break	%	3.2	8	3	6
Flexural modulus	MPa	7800	4900	8800	6500
Flexural strength	MPa	240	150	270	170
Flexural strain at flexural strength	%	4.0	6.0	4.0	6.0
Flexural stress at 3.5 % strain	MPa	225	125		150
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	80	80	70	75
Charpy impact strength -30 °C	kJ/m <sup>2</sup>			60	60
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>			10	15
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>			< 10	< 10
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>			< 10	< 10
Izod impact strength 23 °C	kJ/m <sup>2</sup>	70	70	55	65
Izod impact strength -30 °C	kJ/m <sup>2</sup>	65	60	50	50
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	10	15	< 10	< 10
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>			< 10	< 10
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>				
<b>THERMAL PROPERTIES</b>					
Melting temperature	°C	260		260	
Temperature of deflection under load HDT, method Af	°C	240		-220	
Temperature of deflection under load HDT, method Bf	°C	> 250		-250	
Temperature of deflection under load HDT, method Cf	°C			-90	
Vicat softening temperature, B50	°C			> 230	
Vicat softening temperature, B120	°C			> 230	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.3		0.2	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.9		0.8	
Resistance to heat (ball pressure test)	°C				
Burning behavior UL 94 (UL Yellow Card)	Classification				
Oxygen index	%			26	
Glow Wire Flammability Index (GWFI)	°C			650 (2.0)	
Glow Wire Ignition Temperature (GWIT)	°C				
<b>ELECTRICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Relative permittivity; 100 Hz	-			4	8
Relative permittivity; 1 MHz	-			4	4
Dissipation factor; 100 Hz	10 <sup>-4</sup>			90	1800
Dissipation factor; 1 MHz	10 <sup>-4</sup>			170	600
Volume resistivity	Ohm			1E13	1E10
Surface resistivity	Ohm			1E15	1E13
Electric strength	kV/mm			31	28
Comparative tracking index CTI	Rating			375 - 0.3	
Comparative tracking index CTI M	Rating			275 (225) M - 1.6	
<b>OTHER PROPERTIES (23 °C)</b>					
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min				
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min	21 (270/5)		15	
Molding shrinkage, parallel; 150x105x3	%			0.25	
Molding shrinkage, across; 150x105x3	%			0.94	
Mold 80 °C; melt temperature/back pressure	°C/bar			280/500	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%			0.04	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%			0.08	
Molding shrinkage, parallel; 60x60x2	%	0.37			
Molding shrinkage, across; 60x60x2	%	0.82			
Mold 80 °C; melt temperature/back pressure	°C/bar	290/600			
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%	0.06			
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%	0.04			
Water absorption (saturation value)	%			-5	
Water absorption (equilibrium value)	%			-1.9	
Glass fiber/glass bead/filler content	%	30		30	
Density	kg/m <sup>3</sup>	1340		1360	
<b>PROCESSING CONDITIONS FOR TEST SPECIMENS</b>					
Injection molding – melt temperature	°C	280		290	
Injection molding – mold temperature	°C	80		80	

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

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## PA 66

## REINFORCED/FILLED

## GAS/WATER INJECTION TECHNOLOGY

## IMPROVED HYDROLYSIS RESISTANCE

AKV 30 GIT H2.0 900116 30 % glass fibers		DP AKV 30 X HR 900116 30 % glass fiber mixture		DP 2-2224/30 H2.0 901510 30 % glass fibers and mineral		AKV 30 HR H2.0 901510 30 % glass fibers	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
9200	6600	7300		9000	4200	9700	6100
190	110	145		120	60	180	120
4	6	3.5		2.8	8	4	8
8500	6000	6700		8000	4500	8600	5400
280	180	220		190	100	280	180
4.5	6.0	4.5		3.5	6.0	4.5	6.5
260	157	200		190	85	260	150
70	80			50	55	85	90
60	60			45	45	75	75
10	15			< 10	< 10	12	20
< 10	< 10			< 10	< 10	< 10	< 10
< 10	< 10			< 10	< 10	< 10	< 10
70	80	40					
60	60	35					
10	15			< 10	< 10		
10	10			< 10	< 10	10	10
						< 10	< 10
215				195		205	105
260				263		263	
~220				~235		~245	
~250				~250		~250	
~90				~85		~125	
> 230						> 230	
> 230				230		> 230	
0.2				0.3		0.3	
0.8				0.7		0.9	
						HB (0.75)	
25				28		26	
650 (2.0)				650 (2.0)		650 (2.0)	
4	8			4.7	12.8	4	12
3.8	4.2			3.9	4.4	3.6	4.5
80	2100			260	2800	80	3000
160	700			220	850	160	900
1E13	1E10			1E13	1E09	1E13	1E09
1E15	1E13			1E13	1E13	1E15	1E13
45	40			40	29	35	30
475 (425) - 0.5				350 - 0.3		450 - 0.4	
350 (300) M - 1.6				225 M - 1.1		350 M - 0.9	
						10	
0.22				0.60		0.35	
0.93				0.76		1.27	
290/500				280/400		290/500	
0.04				0.15		0.04	
0.08				0.07		0.07	
~5.0				~5.5		~5.5	
~2.0				~2.1		~2.0	
30				30		30	
1368				1360		1360	
290				290		290	
80				80		80	

# REFERENCE DATA

## PA 6 AND CO-POLYAMIDES, FLAME RETARDANT

PROPERTIES <sup>1</sup>	UNITS	NON-REINFORCED		REINFORCED	
		HALOGEN-FREE KU 2-2183 000000 UL94V-2 (0.75 mm)	HALOGEN-FREE DP 1801/30 H3.0 000000 30 % glass fibers, UL94V-2 (0.75 mm)		
COLOR					
BRIEF DESCRIPTION					
MECHANICAL PROPERTIES (23 °C/50 % R.H.)		dry as molded	conditioned	dry as molded	conditioned
Tensile modulus	MPa	3400	1100	7600	3400
Yield stress	MPa	90	45	96	50
Yield strain	%	4.0	22.5	2.4	9.7
Nominal strain at break	%	9.6	265		
Stress at break	MPa	60	65	93	47
Strain at break	%	15.5	293	4	28
Flexural modulus	MPa	3000	900	7300	3200
Flexural strength	MPa	120	35	150	75
Flexural strain at flexural strength	%	5.9	8.1	3.9	6.9
Flexural stress at 3.5 % strain	MPa	100	26	170	75
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	N	N	50	84
Charpy impact strength -30 °C	kJ/m <sup>2</sup>				
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>			< 10	
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>			< 10	
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>			< 10	
Izod impact strength 23 °C	kJ/m <sup>2</sup>	N	N	35	80
Izod impact strength -30 °C	kJ/m <sup>2</sup>				
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	< 10		< 10	
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>	< 10		< 10	
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	135		194	
THERMAL PROPERTIES					
Melting temperature	°C	222		222	
Temperature of deflection under load HDT, method Af	°C	66		-175	
Temperature of deflection under load HDT, method Bf	°C	166		-210	
Temperature of deflection under load HDT, method Cf	°C				
Vicat softening temperature, B50	°C				
Vicat softening temperature, B120	°C			212	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.9		0.82	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.8		0.35	
Resistance to heat (ball pressure test)	°C				
Burning behavior UL 94 (UL Yellow Card)	Classification	V-2 (0.75)		V-2 (0.75)	
Oxygen index	%	28		30	
Glow Wire Flammability Index (GWFI)	°C	960 (3.0)		960 (1.6)	
Glow Wire Ignition Temperature (GWIT)	°C	750 (3.0)		775 (0.75)	
ELECTRICAL PROPERTIES (23 °C/50 % R.H.)					
Relative permittivity; 100 Hz	-				
Relative permittivity; 1 MHz	-				
Dissipation factor; 100 Hz	10 <sup>-4</sup>				
Dissipation factor; 1 MHz	10 <sup>-4</sup>				
Volume resistivity	Ohm			1E13	
Surface resistivity	Ohm			1E13	
Electric strength	kV/mm			38	
Comparative tracking index CTI	Rating	600 – 1.6		550	
Comparative tracking index CTI M	Rating				
OTHER PROPERTIES (23 °C)					
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min	28		27.4	
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min				
Molding shrinkage, parallel; 150x105x3	%	0.90		0.35	
Molding shrinkage, across; 150x105x3	%	0.90		0.95	
Mold 80 °C; melt temperature/back pressure	°C/bar	260/500		260/500	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.20		0.09	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.20		0.24	
Molding shrinkage, parallel; 60x60x2	%	0.90		0.55	
Molding shrinkage, across; 60x60x2	%	0.90		0.63	
Mold 80 °C; melt temperature/back pressure	°C/bar	260/600		260/600	
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%	0.30		0.14	
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%	0.30		0.15	
Water absorption (saturation value)	%	-10.0		5.9	
Water absorption (equilibrium value)	%	-3.0			
Glass fiber/glass bead/filler content	%			30	
Density	kg/m <sup>3</sup>	1140		1400	
PROCESSING CONDITIONS FOR TEST SPECIMENS					
Injection molding – melt temperature	°C	260		260	
Injection molding – mold temperature	°C	80		80	

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<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure



## DURETHAN®

## PA 6 AND CO-POLYAMIDES, FLAME RETARDANT

## PA 66, FLAME RETARDANT

REINFORCED				NON-REINFORCED			
HALOGEN-FREE		HALOGEN		HALOGEN-FREE		HALOGEN-FREE	
DP 1803/10 H3.0 000000 50 % glass fibers and mineral, UL94V-2 (0.75 mm)		KU 2-2184/15 H3.0 000000 65 % glass fibers and mineral, UL94V-0 (1.2 mm)		DP 1852/30 000000 30 % glass fibers, UL94V-0 (1.5 mm)		DP 2801 000000 UL94V-2 (0.75 mm)	
dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned	dry as molded	conditioned
8500	3900	11500	5800	11000	7000	3500	1400
					85	94	55
					3.0	4.2	20
						10	155
107	60	127	75	140	80	80	55
2.3	5.5	2	3	2.5	3.4	11	230
8000	3600	12500	6700	10000	6000	3200	1300
180	96	175	110	210	130	127	49
3.1	5.3	1.5	2.0	2.7	3.7	6.2	8.0
	85				135	105	36
40	45	30	25	55	55	110	N
		25	15	45		120	185
		< 10	< 10			< 10	15
		< 10	< 10			< 10	< 10
		< 10	< 10				
35	35	25	25	50	55	80	N
				45		110	130
				11	14	< 10	10
< 10	< 10	< 10	< 10	9		< 10	< 10
		< 10	< 10				
230		320	190	226		151	70
223		220		222		265	
168		~170		203		~75	
205		~200		218		~210	
		~75		213		~60	
		~200					
		~200				> 230	
0.4		0.3		0.75		0.7	
0.6		0.6		0.23		0.9	
						249	
V-2 (0.75)		V-0 (1.2)		V-0 (1.5)		V-2 (0.75)	
		68				30	
960 (3.0)		960 (3.0)		960 (2.0)		960 (1.0)	
775 (3.0)		775 (3.0)		800 (3.0)		775 (0.75)	
		4.9	7.1				
		4.6	4.7				
		70	1100				
		120	350				
		1E13	1E11				
		1E15	1E13				
		30	28				
600		600 - 0.1		400		600	
		600 M - 0.4				400 M - 1.8	
9		5		33			
		0.32		0.19		1.16	
		0.70		0.69		1.51	
		280/400		280/500		280/500	
		0.05		0.04		0.36	
		0.08		0.16		0.09	
0.50		0.31		0.23		1.14	
0.50		0.43		0.55		1.22	
290/600		280/600		280/600		280/600	
0.13		0.11		0.07 (120/1)		0.42	
0.11		0.12		0.14 (120/1)		0.11	
		-3.5					
		-1.2		1.3			
50		65		30			
		1700		1669		1143	
290		290		280		280	
80		80		80		80	

# REFERENCE DATA

## PA 66, FLAME RETARDANT

PROPERTIES <sup>1</sup>	UNITS	REINFORCED			
		HALOGEN-FREE		HALOGEN	
COLOR		DP 2802/30 000000		DP 2851/30 H3.0 000000	
BRIEF DESCRIPTION		30 % glass fibers, UL94V-2 (0.75 mm)		30 % glass fibers, UL94V-0 (0.75 mm)	
		dry as molded	conditioned	dry as molded	conditioned
<b>MECHANICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Tensile modulus	MPa	6000	3900	12400	8600
Yield stress	MPa		58		
Yield strain	%		7.8		
Nominal strain at break	%				
Stress at break	MPa	85	56	160	105
Strain at break	%	3.5	13.2	2	3
Flexural modulus	MPa	5500	3700	10800	7300
Flexural strength	MPa	150	90	235	165
Flexural strain at flexural strength	%	5.0	6.5	2.6	3.4
Flexural stress at 3.5 % strain	MPa	140	80		
Charpy impact strength 23 °C	kJ/m <sup>2</sup>	35	60	50	50
Charpy impact strength -30 °C	kJ/m <sup>2</sup>			40	40
Charpy notched impact strength 23 °C	kJ/m <sup>2</sup>	< 10	< 10		
Charpy notched impact strength -30 °C	kJ/m <sup>2</sup>				
Charpy notched impact strength -40 °C	kJ/m <sup>2</sup>				
Izod impact strength 23 °C	kJ/m <sup>2</sup>	30	50	45	40
Izod impact strength -30 °C	kJ/m <sup>2</sup>				
Izod notched impact strength 23 °C	kJ/m <sup>2</sup>	< 10	< 10	< 10	
Izod notched impact strength -30 °C	kJ/m <sup>2</sup>			< 10	
Izod notched impact strength -40 °C	kJ/m <sup>2</sup>				
Ball indentation hardness	N/mm <sup>2</sup>	200		250	129
<b>THERMAL PROPERTIES</b>					
Melting temperature	°C	263		260	
Temperature of deflection under load HDT, method Af	°C	~155		221	
Temperature of deflection under load HDT, method Bf	°C	~250		245	
Temperature of deflection under load HDT, method Cf	°C				
Vicat softening temperature, B50	°C				
Vicat softening temperature, B120	°C	> 230		230	
Coefficient of linear thermal expansion, parallel	10 <sup>-4</sup> /K	0.71		0.3	
Coefficient of linear thermal expansion, across	10 <sup>-4</sup> /K	0.39		0.8	
Resistance to heat (ball pressure test)	°C				
Burning behavior UL 94 (UL Yellow Card)	Classification	V-2 (0.75)		V-0 (0.75)	
Oxygen index	%			39.8	
Glow Wire Flammability Index (GWFI)	°C	960 (0.75)		960 (1.0)	
Glow Wire Ignition Temperature (GWIT)	°C	775 (0.75)		775 (0.75)	
<b>ELECTRICAL PROPERTIES (23 °C/50 % R.H.)</b>					
Relative permittivity; 100 Hz	-				
Relative permittivity; 1 MHz	-				
Dissipation factor; 100 Hz	10 <sup>-4</sup>				
Dissipation factor; 1 MHz	10 <sup>-4</sup>				
Volume resistivity	Ohm				
Surface resistivity	Ohm				
Electric strength	kV/mm	33			
Comparative tracking index CTI	Rating	600		400	
Comparative tracking index CTI M	Rating				
<b>OTHER PROPERTIES (23 °C)</b>					
Melt volume-flow rate (MVR), 260 °C; 5 kg *	cm <sup>3</sup> /10 min				
Melt volume-flow rate (MVR), 280 °C; 5 kg *	cm <sup>3</sup> /10 min				
Molding shrinkage, parallel; 150x105x3	%	1.20		0.23	
Molding shrinkage, across; 150x105x3	%	1.50		0.81	
Mold 80 °C; melt temperature/back pressure	°C/bar	280/500		280/500	
Post-shrinkage, parallel; 150x105x3; 120 °C; 4 h *	%	0.10		0.04	
Post-shrinkage, across; 150x105x3; 120 °C; 4 h *	%	0.20		0.14	
Molding shrinkage, parallel; 60x60x2	%	0.64			
Molding shrinkage, across; 60x60x2	%	0.77			
Mold 80 °C; melt temperature/back pressure	°C/bar	280/600			
Post-shrinkage, parallel; 60x60x2; 120 °C; 4 h *	%	0.16			
Post-shrinkage, across; 60x60x2; 120 °C; 4 h *	%	0.11			
Water absorption (saturation value)	%				
Water absorption (equilibrium value)	%				
Glass fiber/glass bead/filler content	%	30		30	
Density	kg/m <sup>3</sup>	1400		1667	
<b>PROCESSING CONDITIONS FOR TEST SPECIMENS</b>					
Injection molding – melt temperature	°C	280		280	
Injection molding – mold temperature	°C	80		80	

PLEASE NOTE THAT OUR PRODUCT INFORMATION AND DATA ARE SUBJECT TO CONTINUOUS EXAMINATION AND UPDATES. MAKE SURE YOU REFER TO FURTHER INFORMATION AND THE LATEST UPDATES AT [WWW.DURETHAN.COM](http://WWW.DURETHAN.COM)

<sup>1</sup> See page 1 of the table for test conditions and standards

\* deviant figures in parenthesis

N = no failure



AKV 30HRH2.0  
LSR 2740  
LS 180°C

1000h





P200/004

2000

P200/076

P200/051

P200/050

P200/049

P200/059

P200/077

# DURETHAN®

## COLOR NOMENCLATURE

Durethan® is available in a large number of colors. We use a six-digit number to precisely characterize the color, which follows on after the grade designation. The first two digits specify the color class, while the remaining digits are used for administrative purposes in the color laboratory. The material's natural color generally has the designation "000000".

COLOR CLASS	FIRST TWO DIGITS
NATURAL	00
WHITE	01
YELLOW	10
ORANGE	20
RED	30
PURPLE	40
BLUE	50
GREEN	60
GREY	70
BROWN	80
BLACK	90

Example: Durethan® BKV 30 000000: natural color  
Durethan® BKV 30 H2.0 901510: black

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