

# HAGE3D MATERIAL DATASHEET

	ENGINEERING PLASTICS														
	ABS	ASA	ABS-ESD	ABS-FR	HT-PETG	PCTG	TPC	TPU	PA6	PA12	CoPA	PC	PC-FR	PC-ABS	PP
diameter	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm	1,75 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm
applications	design objects large objects design proto- types functional prototypes	design objects large objects design proto- types functional prototypes	electrical parts electronical assemblies	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production mechanical constructions	electronical assemblies automotive mechanical constructions	flexible parts	flexible parts	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production
notched impact strength (23 °C max)	58 kJ/m <sup>2</sup>	18 kJ/m <sup>2</sup>	11 kJ/m <sup>2</sup>	29 kJ/m <sup>2</sup>	860 J/m	2 kJ/m <sup>2</sup>	no break	no break	-	-	10 kJ/m <sup>2</sup>	25 kJ/m <sup>2</sup>	8 kJ/m <sup>2</sup>	13 kJ/m <sup>2</sup>	-
tensile strength (max)	44 MPa	48 MPa	24 MPa	36 MPa	43 MPa	37 MPa	8 MPa	50 MPa	80 MPa	80 MPa	67 MPa	60 MPa	67 MPa	40 MPa	12 MPa
youngs modulus (max)	2030 MPa	2020 MPa	1121 MPa	1860 MPa	-	1763 MPa	29 MPa	150 MPa	3300 MPa	3300 MPa	2300 MPa	2048 MPa	2634 MPa	1832 MPa	-
elongation at break (max)	34 %	15 %	-	9 %	-	3 %	390 %	450 %	4 %	-	10 %	12 %	4 %	-	> 600 %
flexural strength (max)	-	-	27 MPa	66 MPa	64 MPa	56 MPa	-	-	-	-	97 MPa	94 MPa	97 MPa	66 MPa	-
flexural modulus (max)	-	-	856 MPa	2148 MPa	1575 MPa	1613 MPa	-	-	2370 MPa	-	1667 MPa	2044 MPa	2518 MPa	2081 MPa	402 MPa
hardness	-	98A (Shore)	-	-	11 (Rockwell)	-	34D (Shore)	98A (Shore)	-	-	-	-	-	-	50D (Shore)
operating temperature (long run)	95 °C	95 °C	85 °C	90 °C	100 °C	75 °C	90 °C	138 °C	90 °C	100 °C	110 °C	110 °C	110 °C	135 °C	100 °C
specific	good mechani- cal behaviour good look	good mechani- cal behaviour UV-resistant	low static charge	UL 94 VO	high perfor- mance PETG	related to PETG ESD-safe	elastical UV-resistant	elastical good mechani- cal behaviour	tensile good mechani- cal behaviour	tensile good mechani- cal behaviour	very tensile	high isotropy	UL 94 VO	high impact strength	very media resistant
<b>BASIC-SETTINGS</b>															
average extrusion temperature (1,75 mm)	245 °C	245 °C	260 °C	250 °C	260 °C	260 °C	230 °C	240 °C	275 °C	290 °C	265 °C	270 °C	270 °C	260 °C	230 °C
active built chamber heating	depends on the shape	depends on the shape	yes	yes	no	yes	no	no	yes	yes	yes	yes	yes	yes	yes
support system	BVOH, PLA	BVOH, PLA	BVOH	BVOH	BVOH	BVOH	BVOH	BVOH	BVOH	BVOH	PolyDissolve S1 BVOH	PolyDissolve S2 BVOH	PolyDissolve S2 BVOH	PolyDissolve S2 BVOH	P-Support 279

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	STANDARD PLASTICS			REINFORCED PLASTICS (SHORT FIBRES)					METAL		HIGH TEMPERATURE PLASTICS			SUPPORT		
	PETG	PLA	Design PLA	PA6 / CF	PA6 / GF	PA12 / CF	PP / GF	PC / CF	316 L	17-4 PH	PEKK	PAEK	PPSU	PVA	BVOH	
diameter	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm	1,75 mm 2,85 mm	1,75 mm 2,85 mm	
applications	functional prototypes small series production mechanical constructions	functional prototypes	design objects functional prototypes	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	spare parts small series production mechanical constructions	spare parts small series production mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	functional prototypes small series production automotive mechanical constructions	-	-
notched impact strength (23 °C max)	7 kJ/m <sup>2</sup>	6 kJ/m <sup>2</sup>	7 kJ/m <sup>2</sup>	47 kJ/m <sup>2</sup>	-	35 kJ/m <sup>2</sup>	23 kJ/m <sup>2</sup>	23 kJ/m <sup>2</sup>	-	-	-	8 kJ/m <sup>2</sup>	-	-	-	-
tensile strength (max)	50 MPa	105 MPa	45 MPa	120 MPa	90 MPa	90 MPa	42 MPa	70 MPa	485 MPa	950 MPa	85 MPa	90 MPa	70 MPa	-	-	
youngs modulus (max)	1940 MPa	3145 MPa	3000 MPa	14400 MPa	5560 MPa	11500 MPa	2628 MPa	62000 MPa	193 GPa	-	2850 MPa	3100 MPa	2340 GPa	-	-	
elongation at break (max)	120 %	175 %	4 %	1 %	2 %	-	4 %	2 %	-	4 %	8 %	12 %	7 %	-	-	
flexural strength (max)	71 MPa	54 MPa	67 MPa	-	-	-	77 MPa	90 MPa	-	-	-	-	91 MPa	-	-	
flexural modulus (max)	2148 MPa	2364 MPa	3640 MPa	4780 MPa	3080 MPa	4120 MPa	3507 MPa	5890 MPa	-	-	-	-	2410 MPa	-	-	
hardness	105 (Rockwell)	72D (Shore)	72D (Shore)	-	-	-	-	-	-	257 HV10	-	-	-	-	-	
operating temperature (long run)	75 °C	62 °C	55 °C	120 °C	90 °C	90 °C	127 °C	135 °C	-	-	172 °C	-	207 °C	-	-	
specific	allround material	easy to print	good surface quality	high tensile strength	high tensile strength	high tensile strength	high tensile strength	very high tensile strength	sintered metal parts stainless steel (austenitic)	sintered metal parts stainless steel (martensitic)	HT-ready UL94 VO	HT-ready, PEEK-substitute, temperbar, UL 94 VO	HT-ready, UL94 VO	soluble in water	soluble in water	
<b>BASIC-SETTINGS</b>																
average extrusion temperature (1,75 mm)	230 °C	210 °C	210 °C	275 °C	275 °C	290 °C	250 °C	300 °C	240 °C	290 °C	380 °C	340 °C	380 °C	230 °C	230 °C	
active built chamber heating	no	no	no	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	no	no	
support system	BVOH	PLA	PVA	BVOH	BVOH	BVOH	P-Support 279	BVOH	in preparation	BVOH	in preparation	in preparation	in preparation	-	-	