

epsan^e



**PRODUCT
CATALOGUE**



We manufacture innovative, reliable, efficient, sustainable and environment friendly products in the field of engineering plastics, and in all industries that touch our lives, by taking into account the ever increasing global client expectations. With more than 40 years of experience, we offer special solutions to our clients with PPA, PBT, PET, PBT/PET, PA/ABS and PBT/ASA compounds, primarily Polyamide 6 and 6.6. We are a solution partner for a variety of industries and applications ranging from pilot productions to high tonnage applications, with our double screw extruders ranging from 26 mm to 70 mm in our large machinery park, together with our industry 4.0 compliant infrastructure and automation investments.

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PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 GFR 10 NC Q1B001	EPLAMID 6 GFR 15 NC Q1B501	EPLAMID 6 GFR 25 NC Q1C502*	EPLAMID 6 GFR 30 NC ST Q1D001	EPLAMID 6 GFR 40 NC Q1E002	EPLAMID 6 GFR 50 NC Q1F001	EPLAMID 6 GFR 60 NC Q1G001
ABBREVIATION	ISO 1043	-	-	PA6-GF10	PA6-GF15	PA6-GF25	PA6-GF30	PA6-GF40	PA6-GF50	PA6-GF60
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.19	1.23	1.3	1.35	1.46	1.57	1.69
FILLER CONTENT	Epsan Int.	-	%	10	15	25	30	40	50	60
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	2.6	2.5	2.2	2.1	1.6	1.4	1.3
WATER ABSORPTION(SATURATION)	ISO 62	-	%	8.2	7.6	7.2	6.5	5.4	4.5	3.6
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.8/1.1	0.7/1	0.5/0.8	0.4/0.7	0.3/0.5	0.2/0.3	0.1/0.2
MECHANICAL PROPERTIES for D.A.M Conditions										
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	5200	6000	8500	10000	13000	17000	19800
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	115	135	175	180	205	225	220
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	3.5	3.5	3.5	3.5	3	2.5	2
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	4400	5000	7500	9000	11500	14500	17000
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	210	230	270	285	305	335	350
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	6	7	11	14	17	17	15
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	45	50	65	85	95	100	95
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	7	8	12	15	18	18	16
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	50	55	70	90	100	105	100
THERMAL PROPERTIES										
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	220	220	220	220
HDT/B	ISO 75-2/B	0.45 MPa	°C	210	210	215	215	215	215	215
HDT/A	ISO 75-2/A	1.80 MPa	°C	185	185	205	205	205	210	210
FLAMMABILITY & ELECTRICAL PROPERTIES										
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	550	550	550	550	500	500	500
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100



PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 66 GFS 15 HS NC Q1B501	EPLAMID 66 GFS 20 HS NC Q1C001	EPLAMID 66 GFS 30 HS NC Q1D001	EPLAMID 66 GFS 35 HS NC Q1D501	EPLAMID 66 GFS 40 HS NC Q1E001	EPLAMID 66 GFS 50 HS NC Q1F001
ABBREVIATION	ISO 1043	-	-	PA66-GF15	PA66-GF20	PA66-GF30	PA66-GF35	PA66-GF40	PA66-GF50
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.23	1.27	1.36	1.41	1.46	1.56
FILLER CONTENT	Epsan Int.	-	%	15	20	30	35	40	50
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	2.3	2.2	1.9	1.7	1.6	1.4
WATER ABSORPTION(SATURATION)	ISO 62	-	%	7	6.5	5.5	5.1	4.7	4.5
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.6/1.0	0.5/0.9	0.4/0.8	0.4/0.7	0.3/0.6	0.2/0.4
MECHANICAL PROPERTIES for D.A.M Conditions									
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	6200	7800	10000	12000	13000	16500
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	130	155	190	200	215	225
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	3	3	3	3	3	2.5
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	5400	7200	9200	10500	12700	14500
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	200	255	290	315	320	325
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	7	8	12	14	15	15
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	45	50	70	85	90	95
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	8	9	13	15	16	16
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	50	55	75	90	95	100
THERMAL PROPERTIES									
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	260	260	260	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	250	255	255	255	255	255
HDT/A	ISO 75-2/A	1.80 MPa	°C	245	245	250	250	250	250
FLAMMABILITY & ELECTRICAL PROPERTIES									
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	500	500	500	500	500	500
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 IMP NC Q1A501	EPLAMID 6 IMP NC Q1A801	EPLAMID 6 IMP NC Q1B001	EPLAMID 6 IMP NC Q1B301	EPLAMID 6 IMP NC Q1B801	EPLAMID 6 IMP NC Q1C201	EPLAMID 6 IMP NC Q1D002	EPLAMID 6 IMP HV BK Q1D001
ABBREVIATION	ISO 1043	-	-	PA6-I	PA6-I	PA6-I	PA6-I	PA6-I	PA6-I	PA6-I	PA6-I
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.10	1.09	1.08	1.08	1.07	1.06	1.04	1.04
FILLER CONTENT	Epsan Int.	-	%	-	-	-	-	-	-	-	-
HUMIDITY ABSORPTION(EQUIBILIRIUM)	ISO 62	-	%	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3
WATER ABSORPTION(SATURATION)	ISO 62	-	%	8.9	8.8	8.7	8.6	8.5	7	6.8	6.8
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.2/1.4	1.3/1.5	1.3/1.6	1.4/1.7	1.6/1.9	1.8/2.1	2/2.4	2.1/2.5
MECHANICAL PROPERTIES for D.A.M Conditions											
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	2400	2200	2100	2000	1800	1600	1300	1400
TENSILE STRESS AT BREAK (50 mm/min)	ISO 527-2	23°C	MPa	45	55	50	45	35	32	25	40
TENSILE STRAIN AT BREAK (50 mm/min)	ISO 527-2	23°C	%	>40	>45	>50	>50	>50	>100	>100	>100
TENSILE STRESS AT YIELD(50mm/min)	ISO 527-2	23°C	MPa	70	65	60	60	50	40	35	40
TENSILE STRAIN AT YIELD(50mm/min)	ISO 527-2	23°C	%	5	4	4	4	4	4	4	4
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	2050	1950	1750	1750	1550	1500	1150	1150
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	85	80	75	70	60	50	40	55
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	13	18	25	50	70	75	80	80
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	No Break	No Break	No Break	No Break	No Break	No Break	No Break	No Break
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	15	20	30	55	75	80	85	85
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	No Break	No Break	No Break	No Break	No Break	No Break	No Break	No Break
THERMAL PROPERTIES											
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	220	220	220	220	220
HDT/B	ISO 75-2/B	0.45 MPa	°C	160	150	150	150	140	130	120	120
HDT/A	ISO 75-2/A	1.80 MPa	°C	60	55	55	55	50	50	45	45
FLAMMABILITY & ELECTRICAL PROPERTIES											
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	600	600	600	600	600	600	600
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1E+13	1E+13
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 66 IMP NC Q1A501	EPLAMID 66 IMP NC Q1A802	EPLAMID 66 IMP NC Q1B001	EPLAMID 66 IMP NC Q1B301	EPLAMID 66 IMP NC Q1B801	EPLAMID 66 IMP NC Q1C201	EPLAMID 66 IMP NC Q1D001
ABBREVIATION	ISO 1043	-	-	PA66-I	PA66-I	PA66-I	PA66-I	PA66-I	PA66-I	PA66-I
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.12	1.10	1.09	1.09	1.08	1.07	1.05
FILLER CONTENT	Epsan Int.	-	%	-	-	-	-	-	-	-
HUMIDITY ABSORPTION(EQUIBILIRIUM)	ISO 62	-	%	2.2	2.2	2.1	2.1	2	1.9	1.7
WATER ABSORPTION(SATURATION)	ISO 62	-	%	7.4	7.2	7.1	6.9	6.5	6.3	5.8
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.4/1.6	1.5/1.6	1.5/1.7	1.6/1.7	1.6/1.9	1.8/2.1	1.9/2.2
MECHANICAL PROPERTIES for D.A.M Conditions										
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	2800	2600	2350	2300	2000	1800	1500
TENSILE STRESS AT BREAK (50 mm/min)	ISO 527-2	23°C	MPa	60	55	53	53	45	45	40
TENSILE STRAIN AT BREAK (50 mm/min)	ISO 527-2	23°C	%	>40	>30	>45	>50	>50	>50	>50
TENSILE STRESS AT YIELD(50mm/min)	ISO 527-2	23°C	MPa	70	65	65	60	50	48	45
TENSILE STRAIN AT YIELD(50mm/min)	ISO 527-2	23°C	%	7	7	6	5	5	5	5
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	2300	2200	2100	2000	1900	1700	1100
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	90	90	85	85	78	65	65
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	13	14	24	60	77	85	90
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	No Break	No Break	No Break	No Break	No Break	No Break	No Break
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	15	16	27	65	80	90	100
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	No Break	No Break	No Break	No Break	No Break	No Break	No Break
THERMAL PROPERTIES										
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	260	260	260	260	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	205	200	185	160	160	150	145
HDT/A	ISO 75-2/A	1.80 MPa	°C	75	70	65	65	60	55	50
FLAMMABILITY & ELECTRICAL PROPERTIES										
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	600	600	600	600	600	600
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 FX2 GRY Q1B602	EPLAMID 6 FX0 NC Q1B301	EPLAMID 6 FX0 BK Q1B301	EPLAMID 6 FV0 NC Q1C001	EPLAMID 6 FV0 BK Q1C501	EPLAMID 6 GX2 20 NC Q1C0B201*	EPLAMID 6 GX0 30 NC Q1D0B801	EPLAMID 6 GV0 20 NC Q1C0C001	EPLAMID 6 GV0 30 NC Q1D0C002
ABBREVIATION	ISO 1043	-	-	PA6 FR(30)	PA6 FR(30)	PA6 FR(30)	PA6 FR(17)	PA6 FR(17)	PA6-GF20 FR(30)	PA6-GF30 FR(40)	PA6-GF20 FR(17)	PA6-GF30 FR(17)
COLOUR	-	-	-	GREY	NATURAL	BLACK	NATURAL	BLACK	NATURAL	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.19	1.18	1.16	1.31	1.35	1.32	1.40	1.50	1.62
FILLER CONTENT	Epsan Int.	-	%	-	-	-	-	-	20	30	20	30
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	2	2	2	2.7	2.7	1.7	1.5	1.9	1.1
WATER ABSORPTION(SATURATION)	ISO 62	-	%	8	8	8	8	8	5.5	5	4	3.7
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.2/1.4	1.2/1.4	1.2/1.4	1.2/1.4	1.2/1.4	0.5/0.9	0.4/0.7	0.6/0.9	0.4/0.7
MECHANICAL PROPERTIES for D.A.M Conditions												
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	3500	3800	3800	3300	3000	6800	10500	8900	10500
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	70	65	75	60	55	90	145	135	150
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	4	>10	3	15	10	3	3	3	2
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	3200	3300	3200	3000	2700	5000	9700	7900	10200
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	105	100	110	95	90	120	160	185	200
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	5	5	<10	6	5	4	9	9	10
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	70	50	80	75	70	40	65	55	55
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	6	6	<10	7	6	5	10	10	11
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	75	55	85	80	75	45	70	60	60
THERMAL PROPERTIES												
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	220	220	220	220	220	220
HDT/B	ISO 75-2/B	0.45 MPa	°C	190	190	190	190	190	210	215	210	215
HDT/A	ISO 75-2/A	1.80 MPa	°C	85	80	80	85	85	175	210	190	205
FLAMMABILITY & ELECTRICAL PROPERTIES												
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	V2 (@0.8mm)	V0 (@0.8mm)	V0 (@0.8mm)	V0 (@1.6mm)	V0 (@0.8mm)	V2 (@0.8mm)	V0 (@0.8mm)	V0 (@0.8mm)	V0 (@0.8mm)
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	960 (@1.6mm)	960(@0.8mm)	960(@0.8mm)	960(@1.6mm)	960(@0.8mm)	960(@0.8mm)	960(@0.8mm)	960(@0.8mm)	960(@1.6mm)
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	775 (@0.8mm)	775 (@1.6mm)	750(@2.00mm)	775 (@0.8mm)	775 (@0.8mm)	825 (@0.8mm)	-	775 (@0.8mm)	800 (@0.8mm)
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	600	600	275	275	600	600	275	275
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100	<100	<100



PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 66 FX0 NC Q1B502*	EPLAMID 66 GX0 25 NC Q1C5C001	EPLAMID 66 GX0 30 NC Q1D0B801	EPLAMID 66 GV0 20 NC Q1C0C001	EPLAMID 66 GV0 30 NC Q1D0C001	EPLAMID 66 GX0 25 RP Q1C5A903*
ABBREVIATION	ISO 1043	-	-	PA66 FR(30)	PA66-GF25 FR(40)	PA66-GF30 FR(40)	PA66-GF20 FR(17)	PA66-GF30 FR(17)	PA66-GF25 FR(52)
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.17	1.36	1.41	1.50	1.62	1.33
FILLER CONTENT	Epsan Int.	-	%	-	25	30	20	30	-
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	2.3	1.6	1.5	1.2	1.2	1.4
WATER ABSORPTION(SATURATION)	ISO 62	-	%	7.6	4.8	4.6	3.6	3.4	6
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.3/1.7	0.4/0.6	0.3/0.9	0.5/1.0	0.4/0.9	0.5/0.9
MECHANICAL PROPERTIES for D.A.M Conditions									
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	3800	9600	10200	8200	12000	8500
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	80	135	140	150	170	150
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	6	2.5	2.5	2.5	2.5	3
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	3500	8900	9100	7000	11000	7400
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	115	185	190	190	230	190
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	5	9	9	7	9	11
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	70	55	60	45	55	65
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	6	10	10	8	10	12
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	75	60	65	50	60	70
THERMAL PROPERTIES									
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	260	260	260	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	210	255	250	245	255	245
HDT/A	ISO 75-2/A	1.80 MPa	°C	95	240	225	230	240	235
FLAMMABILITY & ELECTRICAL PROPERTIES									
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	V0(@0.4mm)	V0(@0.8mm)	V0(@0.8mm)	V0(@0.8mm)	V0(@0.4mm)	V0(@0.8mm)
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	960(@0.8mm)	960(@0.8mm)	960(@0.8mm)	960(@0.8mm)	960(@0.8mm)	960(@0.8mm)
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	960(@0.8mm)	775(@1.6mm)	750(@0.8mm)	775(@0.8mm)	775(@0.8mm)	750(@0.8mm)
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	600	600	275	275	600
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100



PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 GFI 15 BK Q1B5B301	EPLAMID 6 GFI 25 BK Q1C5B001	EPLAMID 6 GFI 30 BK Q1D0A502	EPLAMID 66 GFI 13 NC Q1B3A601	EPLAMID 66 GFI 20 NC Q1C0A801	EPLAMID 66 GFI 30 BK Q1D0A801
ABBREVIATION	ISO 1043	-	-	PA6-I-GF15	PA6-I-GF25	PA6-I-GF30	PA66-I-GF13	PA66-I-GF20	PA66-I-GF30
COLOUR	-	-	-	BLACK	BLACK	BLACK	NATURAL	NATURAL	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.18	1.26	1.34	1.18	1.23	1.31
FILLER CONTENT	Epsan Int.	-	%	15	25	30	13	20	30
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	2	2	1.8	1.9	1.7	1.5
WATER ABSORPTION(SATURATION)	ISO 62	-	%	6.8	7	6.5	6.3	5.7	4.9
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.2/1.3	0.6/0.9	0.5/0.9	0.5/0.9	0.5/0.9	0.4/0.8
MECHANICAL PROPERTIES for D.A.M Conditions									
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	4800	7400	9500	5300	5700	8500
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	80	125	170	115	120	135
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	3	4	4	5	4	3
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	4300	6500	8600	4100	4600	7000
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	130	185	250	140	155	190
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	18	20	17	10	17	15
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	90	68	95	65	68	70
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	20	21	18	11	18	16
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	95	70	100	72	76	75
THERMAL PROPERTIES									
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	210	210	215	240	245	245
HDT/A	ISO 75-2/A	1.80 MPa	°C	190	195	200	230	235	235
FLAMMABILITY & ELECTRICAL PROPERTIES									
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	550	550	550	600	600	600
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	>100	>100	>100	>100	>100	>100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 CBR 30 NC Q1D001	EPLAMID 6 CBR 40 NC Q1E001	EPLAMID 6 CBR 50 BK Q1F001	EPLAMID 66 CBR 15 NC Q1B501	EPLAMID 66 CBR 30 FW NC Q1D001	EPLAMID 66 CBR 50 NC Q1F001
ABBREVIATION	ISO 1043	-	-	PA6-GB30	PA6-GB40	PA6-GB50	PA66-GB15	PA66-GB30	PA66-GB50
COLOUR	-	-	-	NATURAL	NATURAL	BLACK	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.33	1.44	1.54	1.21	1.35	1.54
FILLER CONTENT	Epsan Int.	-	%	30	40	50	15	30	50
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	2.1	1.6	1.4	2.3	1.9	1.4
WATER ABSORPTION(SATURATION)	ISO 62	-	%	6.5	5.4	4.5	7	5.5	4.5
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.6/1.0	0.6/0.9	0.5/0.8	0.8/1.2	0.6/1.1	0.4/0.6
MECHANICAL PROPERTIES for D.A.M Conditions									
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	4400	4800	6300	3700	4600	5600
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	75	80	80	60	90	85
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	4	4	4	4	4	5
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	3200	4200	5500	2900	3900	4500
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	110	120	125	90	120	140
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	4	6	6	4	5	4
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	35	45	45	35	40	35
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	5	7	7	5	6	5
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	50	60	55	40	55	40
THERMAL PROPERTIES									
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	210	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	180	190	215	185	195	215
HDT/A	ISO 75-2/A	1.80 MPa	°C	70	85	90	85	95	100
FLAMMABILITY & ELECTRICAL PROPERTIES									
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	550	550	550	550	550	550
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	>100	>100	>100	>100	>100	>100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6	EPLAMID 6	EPLAMID 6	EPLAMID 6	EPLAMID 6	EPLAMID 66	EPLAMID 66	EPLAMID 66	EPLAMID 66	EPLAMID 66	EPLAMID 66
				GFR 15 BK Q2B502	GFR 25 BK Q2C502	GFR 30 BK Q2D002	GFR 40 BK Q2E002	GFR 50 BK Q2F002	GFS 15 HS BK Q2B502	GFS 30 HS BK Q2D002	GFH 30 HS BK Q3D001	GFS 35 HS BK Q2D502	GFS 50 HS BK Q2F002	GFS 60 HS BK Q2G001
ABBREVIATION	ISO 1043	-	-	PA6-GF15	PA6-GF25	PA6-GF30	PA6-GF40	PA6-GF50	PA66-GF15	PA66-GF30	PA66-GF30	PA66-GF35	PA66-GF50	PA66-GF60
COLOUR	-	-	-	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.23	1.30	1.35	1.44	1.57	1.23	1.36	1.36	1.41	1.56	1.69
FILLER CONTENT	Epsan Int.	-	%	15	25	30	40	50	15	30	30	35	50	60
HUMIDITY ABSORPTION(EQUILIRIUM)	ISO 62	-	%	2.5	2.2	2.1	1.6	1.4	2.3	1.9	1.9	1.7	1.4	1.2
WATER ABSORPTION(SATURATION)	ISO 62	-	%	7.6	7.2	6.5	5.4	4.5	7	5.5	5.5	5.1	4.5	3.9
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.7/1	0.5/0.8	0.4/0.7	0.3/0.5	0.2/0.3	0.6/1	0.4/0.8	0.4/0.8	0.4/0.7	0.2/0.4	0.2/0.3
MECHANICAL PROPERTIES for D.A.M Conditions														
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	6000	8500	9500	13500	16500	5800	10000	10000	11500	16800	20000
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	125	155	175	195	205	120	185	195	200	225	230
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	4	3	3	3	2	3	3	3	3	2.5	2
FLEXURAL MODULUS (2 mm/min)	ISO 180/1A	23°C	MPa	4800	7600	8500	11800	14000	5500	9000	9000	11200	15200	19000
FLEXURAL STRENGTH (2 mm/min)	ISO 180/1U	23°C	MPa	230	260	280	300	315	200	285	275	295	335	385
NOTCHED IZOD IMPACT	ISO 179/1eA	23°C	kJ/m ²	6	7	12	14	14	7	12	12	13	14	14
UNNOTCHED IZOD IMPACT	ISO 179/1eU	23°C	kJ/m ²	45	65	70	85	85	50	70	65	70	90	95
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	7	8	13	15	15	8	13	13	14	15	15
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	50	70	75	90	90	55	75	70	75	95	100
THERMAL PROPERTIES														
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	220	220	260	260	260	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	215	215	215	215	215	250	255	255	255	255	255
HDT/A	ISO 75-2/A	1.80 MPa	°C	200	205	205	205	210	245	250	250	250	250	250
FLAMMABILITY & ELECTRICAL PROPERTIES														
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	550	550	550	500	500	500	500	450	500	500	500
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID HT00 GFR 30 BK Q1D001*	EPLAMID HT00 GFR 50 BK Q1F001*	EPLAMID HT01 GFR 30 BK Q1D001	EPLAMID HT01 GFR 50 BK Q1F001	EPLAMID HT02 GFR 30 BK Q1D001	EPLAMID HT02 GFR 50 BK Q1F001	EPLAMID HT03 GFR 30 BK Q1D001	EPLAMID HT03 GFR 50 BK Q1F001
ABBREVIATION	ISO 1043	-	-	PA6T/X-GF30	PA6T/X-GF50	PA6T/6I/66-GF30	PA6T/6I/66-GF50	PA6T/PA66-GF30	PA6T/66-GF50	PA66/6I/X-GF30	PA66+6I/6T
COLOUR	-	-	-	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.43	1.63	1.42	1.62	1.42	1.61	1.37	1.57
FILLER CONTENT	Epsan Int.	-	%	30	50	30	50	30	50	30	50
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	1.7	1.3	1.8	1.2	1.8	1.2	1.5	1.4
WATER ABSORPTION(SATURATION)	ISO 62	-	%	3.8	3	5	3.5	5	3.5	4.7	4
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.1/0.6	0.1/0.4	0.1/0.6	0.1/0.4	0.1/0.6	0.1/0.6	0.1/0.6	0.1/0.4
MECHANICAL PROPERTIES for D.A.M Conditions											
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	11000	17700	11500	17600	11400	17500	11100	17700
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	190	255	195	250	190	235	190	240
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	2	1.5	3	3	3	2.5	3	2.5
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	-	-	-	-	-	-	-	-
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	-	-	-	-	-	-	-	-
NOTCHED CHARPY IMPACT	ISO 179/1eA	-30°C	kJ/m ²	8	12	9	10	7	11	8	12
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	8	13	9	11	8	12	10	13
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	60	90	50	75	80	90	70	80
THERMAL PROPERTIES											
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	315	315	325	325	310	310	260	260
HDT/C	ISO 75-2/C	8.0 MPa	°C	140	205	200	230	150	150	105	165
HDT/A	ISO 75-2/A	1.80 MPa	°C	280	285	290	290	280	280	230	230
HDT/B	ISO 75-2/B	0.45 MPa	°C	-	-	-	-	-	-	-	-
Maximum working temp. long term	ISO 2578	-	°C	140	150	140	140	140	140	110	110
Maximum working temp. short term	ISO 2578	-	°C	250	250	270	270	250	250	215	215
FLAMMABILITY & ELECTRICAL PROPERTIES											
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	-	-	HB	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	600	600	600	600	600	600	600
DIELECTRIC STRENGTH	IEC 60243-1	-	kV/mm	35	35	35	35	40	40	33	33
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100	<100



PBT GRADES

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPIMIX PBT NC 10	EPIMIX PBT GFR 10 NC Q1B001	EPIMIX PBT GFR 15 NC Q1B501	EPIMIX PBT GFR 30 NC Q1D0A301	EPIMIX PBT FV0 NC Q1B501	EPIMIX PBT GVO 15 NC Q1B5A901	EPIMIX PBT GVO 30 NC Q1D0B001	EPIMIX PBT IMP NC Q1A501	EPIMIX PBT IMP NC Q1C001	EPIMIX PBT IMP NC Q1C201
ABBREVIATION	ISO 1043	-	-	PBT	PBT-GF10	PBT-GF15	PBT-GF30	PBT FR	PBT GF15 FR	PBT GF30 FR	PBT-I	PBT-I	PBT-I
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.31	1.35	1.38	1.51	1.44	1.52	1.64	1.28	1.25	1.22
ASH CONTENT	ISO 3154-4	-	%	-	10	15	30	-	15	30	-	-	-
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	0.25	0.2	0.2	0.15	0.25	0.2	0.15	0.35	0.6	0.7
WATER ABSORPTION(SATURATION)	ISO 62	-	%	0.5	0.4	0.4	0.35	0.5	0.4	0.35	0.7	1	1.1
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.8/2.0	1.2/1.4	0.7/1.3	0.3/1.0	1.5/1.7	0.7/1.3	0.3/1.0	1.7/1.9	1.8/2.0	1.8/2.0
Melt volume - flow rate	ISO 1133	(temperature/load)	cm ³ /10 min	-	28(250°C/2.16kg)	25(250°C/2.16kg)	12(250°C/2.16kg)	-	-	-	-	-	-
MECHANICAL PROPERTIES for D.A.M Conditions													
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	2900	4700	6300	10000	3200	7000	11000	2300	2000	1800
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	-	95	100	135	60	90	130	-	-	-
TENSILE STRESS AT BREAK (50 mm/min)	ISO 527-2	23°C	MPa	60	-	-	-	-	-	-	50	50	35
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	-	3.5	3.5	3	10	2	2.5	-	-	-
TENSILE STRAIN AT BREAK (50 mm/min)	ISO 527-2	23°C	%	200	-	-	-	-	-	-	>30	>50	>50
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	2500	3500	4800	9200	2800	6500	9500	1900	1700	1500
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	80	130	155	200	100	135	185	75	60	55
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	10	5	7	10	5	5	7	8	45	62
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	150	35	45	60	40	20	50	No break	No break	No break
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	10	6	8	11	6	6	8	10	50	80
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	220	40	50	65	45	25	55	No break	No break	No break
THERMAL PROPERTIES													
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	225	225	225	225	225	225	225	225	225	225
HDT/B	ISO 75-2/B	0.45 MPa	°C	160	220	220	220	175	215	200	120	120	140
HDT/A	ISO 75-2/A	1.80 MPa	°C	60	190	190	210	70	195	195	60	60	55
FLAMMABILITY & ELECTRICAL PROPERTIES													
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	V0 (1.6 mm)	V0 (1.6 mm)	V0 (1.6 mm)	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	960 (1.6 mm)	960 (1.6 mm)	960 (1.6 mm)	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	550 (1.6 mm)	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	375	375	375	225	200	200	600	600	600
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+15	1.00E+15	1.00E+13	1.00E+13	1.00E+13
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	PBT/PET GRADES				PBT/ASA GRADES		ABS/PA GRADES		
				EPIMIX PBT/ PET GFR 15 NC Q1B501	EPIMIX PBT/ PET GFR 20 NC Q1C001	EPIMIX PBT/ PET GFR 30 NC Q1D001	EPIMIX PBT/ PET GFR 50 NC Q1F001	EPIMIX PBT/ ASA GFR 20 NC Q1C001	EPIMIX PBT/ ASA GFR 30 NC Q1D001	EPIMIX ABS/ PA IMP NC Q1A501	EPIMIX ABS/ PA GFU 8 NC Q1A8A801	EPIMIX ABS/ PA GFU 15 NC Q1B501
ABBREVIATION	ISO 1043	-	-	PBT/PET GF15	PBT/PET GF20	PBT/PET GF30	PBT/PET GF50	PBT/ASA GF20	PBT/ASA GF30	ABS/PA-I	ABS/PA GF	ABS/PA GF
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm ³	1.41	1.46	1.54	1.73	1.40	1.45	1.07	1.12	1.2
ASH CONTENT	ISO 3154-4	-	%	15	20	30	50	20	30	-	8	15
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	0.3	0.2	0.15	0.1	0.25	0.2	1.4	1.2	1.1
WATER ABSORPTION(SATURATION)	ISO 62	-	%	0.5	0.4	0.35	0.3	0.5	0.4	4	3.7	3.4
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.5/1.0	0.4/1.0	0.3/0.9	0.2/0.8	0.5/0.8	0.4/0.7	0.4/0.8	0.4/0.8	0.4/0.8
Melt volume - flow rate	ISO 1133	(temperature/load)	cm ³ /10 min	30(260°C/2.16kg)	25(260°C/2.16kg)	19(260°C/2.16kg)	15(260°C/5kg)	23(250°C/2.16kg)	27(250°C/5kg)	65(240°C/10kg)	40(240°C/10kg)	20(240°C/10kg)
MECHANICAL PROPERTIES for D.A.M Conditions												
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	5500	7800	10500	18000	7000	9700	2000	3150	5300
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	100	125	140	170	105	125	40	55	90
TENSILE STRESS AT BREAK (50 mm/min)	ISO 527-2	23°C	MPa	-	-	-	-	-	-	-	-	-
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	3	3	2.5	2	2.5	3	>50	5	3
TENSILE STRAIN AT BREAK (50 mm/min)	ISO 527-2	23°C	%	-	-	-	-	-	-	-	-	-
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	5000	7000	9500	17600	6500	8600	1900	2750	4200
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	170	200	210	270	165	175	60	85	130
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	5	6	9	9	7	8	70	11	7
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	32	40	55	55	55	65	No break	50	35
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	6	7	10	10	8	9	70	12	8
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	35	45	60	60	60	70	No break	55	40
THERMAL PROPERTIES												
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	225	225	225	225	225	225	220	220	220
HDT/B	ISO 75-2/B	0.45 MPa	°C	200	215	220	220	210	210	90	130	150
HDT/A	ISO 75-2/A	1.80 MPa	°C	195	195	200	205	165	170	65	80	95
FLAMMABILITY & ELECTRICAL PROPERTIES												
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	350	300	250	250	450	400	-	-	-
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+14	1.00E+14	1.00E+13	1.00E+13	1.00E+13
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLON+ 6 GFR 15 BK Q2B504	EPLON+ 6 GFR 30 BK Q2D004	EPLON+ 6 GFR 50 BK Q2F004	EPLON+ 66 GFR 15 BK Q2B504	EPLON+ 66 GFR 30 BK Q2D004	EPLON+ 66 GFR 35 BK Q2D504	EPLON+ 66 GFR 50 BK Q2F004
ABBREVIATION	ISO 1043	-	-	PA6R-GF15	PA6R-GF30	PA6R-GF50	PA66R-GF15	PA66R-GF30	PA66R-GF35	PA66R-GF50
COLOUR	-	-	-	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.24	1.36	1.58	1.25	1.36	1.41	1.56
FILLER CONTENT	Epsan Int.	-	%	15	30	50	15	30	35	50
HUMIDITY ABSORPTION(EQUILIBIRIUM)	ISO 62	-	%	-	-	-	-	-	-	-
WATER ABSORPTION(SATURATION)	ISO 62	-	%	-	-	-	-	-	-	-
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.8/1.1	0.4/0.7	0.2/0.3	0.8/1.2	0.3/0.6	0.3/0.7	0.2/0.4
MECHANICAL PROPERTIES for D.A.M Conditions										
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	5500	9200	16000	5500	9600	10500	15000
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	110	155	195	110	155	160	190
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	4	3.5	2	3	2.5	2.5	2
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	500	9300	13000	5000	8000	9200	13500
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	170	250	285	185	225	245	295
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	5	11	12	3	6	7.5	7
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	45	65	60	30	45	55	55
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	6	12	13	4	7	8	8
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	50	70	70	35	50	60	60
THERMAL PROPERTIES										
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	260	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	190	215	215	210	235	240	245
HDT/A	ISO 75-2/A	1.80 MPa	°C	175	200	205	180	225	230	235
FLAMMABILITY & ELECTRICAL PROPERTIES										
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	550	550	550	600	600	600	600
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13	1.00E+13
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPIMIX PA 66/ PP BK Q201	EPIMIX PA 6/ PP GFR 30 BK Q2D001	EPLAMID 6 CFR 10 BK Q1B001	EPLAMID 6 CFR 30 BK Q1D001	EPLAMID 66 CFR 20 BK Q1C001	EPLAMID 6 GCF 20 BK Q1B0B001
ABBREVIATION	ISO 1043	-	-	PA66/PP	PA6/PP GF30	PA6 CF10	PA6 CF30	PA66 CF20	PA 6 GF+CF
COLOUR	-	-	-	BLACK	BLACK	BLACK	BLACK	BLACK	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.04	1.26	1.17	1.27	1.22	1.24
FILLER CONTENT	Epsan Int.	-	%	-	30	10	30	20	20
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	-	-	2.7	2.2	1.6	2.4
WATER ABSORPTION(SATURATION)	ISO 62	-	%	-	-	8.6	7.5	6.9	7.4
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	2.5/1.8	0.3/0.8	0.5/0.8	0.2/0.6	0.4/0.7	0.5/0.8
MECHANICAL PROPERTIES for D.A.M Conditions									
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	2400	9500	8500	21000	16700	11500
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	55	125	120	220	200	175
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	>20	3	2	2	2	2.5
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	2000	7800	7000	19000	15200	10200
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	85	190	210	330	260	240
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	5	10	5	8	7	9
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	No break	45	25	38	55	60
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	7	11	6	9	8	10
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	No break	50	30	48	60	65
THERMAL PROPERTIES									
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	260	220	220	220	260	220
HDT/B	ISO 75-2/B	0.45 MPa	°C	150	185	210	215	255	215
HDT/A	ISO 75-2/A	1.80 MPa	°C	65	160	190	195	250	200
FLAMMABILITY & ELECTRICAL PROPERTIES									
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	-	600	150	100	100	150
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+06	1.00E+03	1.00E+03	1.00E+06
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	Low UV		Medium UV		High UV		
				EPLAMID 6 UVL NC Q201	EPLAMID 6 GFU 50 UVL BK Q1F002	EPLAMID 6 IMP UVM NC Q1A501	EPLAMID 66 GFU 30 UVM NC Q1D001	EPLAMID 6 GFU 30 UVH BK Q1D001	EPLAMID 6 GFU 50 UVH BK Q1F001	EPLAMID 6 GCI 30 UVH BK Q1C0B0A501
ABBREVIATION	ISO 1043	-	-	PA6-Unfilled	PA6-GF50	PA6-I	PA66-GF30	PA6-GF30	PA6-GF50	PA6-I-(GF+GB) 30
COLOUR	-	-	-	NATURAL	BLACK	NATURAL	NATURAL	NATURAL	BLACK	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.13	1.57	1.1	1.37	1.35	1.54	1.33
FILLER CONTENT	Epsan Int.	-	%	-	50	-	30	30	50	30
HUMIDITY ABSORPTION(EQUIBILIRIUM)	ISO 62	-	%	3	1.4	2.5	1.9	2.1	1.4	2.1
WATER ABSORPTION(SATURATION)	ISO 62	-	%	10	4.5	8.9	5.5	6.5	4.5	6.5
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.1/1.4	0.2/0.3	1.2/1.4	0.4/0.8	0.4/0.7	0.2/0.3	0.4/0.7
MECHANICAL PROPERTIES for D.A.M Conditions										
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	2700	16200	2500	10000	9100	15300	8000
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	60	195	55	180	160	230	140
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	>15	2	>30	3	3	2	3
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	2500	14000	2050	9300	8700	14100	6200
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	90	305	75	230	235	310	200
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	6	13	13	12	12	16	14
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	90	80	No Break	80	72	85	70
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	7	14	14	13	13	17	16
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	95	85	No Break	85	82	95	80
THERMAL PROPERTIES										
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	260	220	220	220
HDT/B	ISO 75-2/B	0.45 MPa	°C	180	215	160	255	210	215	200
HDT/A	ISO 75-2/A	1.80 MPa	°C	60	210	60	250	205	210	180
FLAMMABILITY & ELECTRICAL PROPERTIES										
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	-	500	600	600	550	550	500
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+14	1.00E+13	1.00E+13	1.00E+13
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 EC NC Q101	EPLAMID 6 EC BK Q1E001	EPLAMID 6 CFR 5 BK Q1A5D001	EPLAMID 6 CFR 10 EC BK Q1B0D001	EPLAMID 66 GCF 30 BK Q1B5B501	EPLAMID 66 IMP EC BK Q1B0G001
ABBREVIATION	ISO 1043	-	-	PA6 + SPECIAL ADDITIVE	PA6 + SPECIAL ADDITIVE	PA6-CF5 + SPECIAL ADDITIVE	PA6-CF10 + SPECIAL ADDITIVE	PA66-(GF+CF)30	PA66-I
COLOUR	-	-	-	NATURAL	BLACK	BLACK	BLACK	BLACK	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.13	1.40	1.32	1.21	1.32	1.15
FILLER CONTENT	Epsan Int.	-	%	-	-	5	10	30	-
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	3	-	3	-	2.1	-
WATER ABSORPTION(SATURATION)	ISO 62	-	%	10	-	8.9	-	5.8	-
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	1.1/1.4	1.1/1.4	0.5/0.9	0.3/0.4	0.2/0.6	1.1/1.4
MECHANICAL PROPERTIES for D.A.M Conditions									
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	2400	9600	7500	16000	16500	2100
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	50	80	110	135	215	40
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	15	2	2	2	2	>20
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	2000	9300	6000	15000	14500	1000
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	85	110	160	185	340	70
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	5	4	9	4	9	11
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	90	30	45	25	50	No break
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	6	4	10	5	10	12
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	100	35	50	30	55	No break
THERMAL PROPERTIES									
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	220	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	150	150	210	210	255	185
HDT/A	ISO 75-2/A	1.80 MPa	°C	50	50	190	190	245	90
FLAMMABILITY & ELECTRICAL PROPERTIES									
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	-	-	-	-	-	-
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+08	1.00E+05	1.00E+05	1.00E+04	1.00E+04	1.00E+06
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPIMIX PBT FW NC Q101	EPLAMID 6 GFR 30 FW BK Q1D001	EPLAMID 66 GFS 30 FW BK Q1D001	EPLAMID 66 GFS 30 FW NC Q1D002	EPLAMID HT00 GFR 40 FW BK Q1E001
ABBREVIATION	ISO 1043	-	-	PBT	PA6-GF30	PA66	PA66-GF30	PA6T/X-GF40
COLOUR	-	-	-	NATURAL	BLACK	NATURAL	NATURAL	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.30	1.35	1.14	1.36	1.52
FILLER CONTENT	Epsan Int.	-	%	-	30	-	30	40
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	0.25	2.1	2.6	1.9	1.5
WATER ABSORPTION(SATURATION)	ISO 62	-	%	0.5	6.5	8.5	5.5	3.5
WATER ABSORPTION(SATURATION)	ISO 294-4	2 mm	%	0.5/1.9	0.4/0.7	1.4/1.6	0.4/0.8	0.1/0.5
MECHANICAL PROPERTIES for D.A.M Conditions								
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	2700	9800	3200	10400	14700
TENSILE STRESS AT BREAK (50 mm/min)	ISO 527-2	23°C	MPa	65	-	-	-	-
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	-	165	85	190	215
TENSILE STRAIN AT BREAK (50 mm/min)	ISO 527-2	23°C	%	8	-	-	-	-
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	-	3	10	3	2
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	2600	8700	2900	9400	-
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	85	250	95	290	-
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	7	11	6	11	-
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	70	70	No break	70	-
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	8	12	6	12	9
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	75	75	No break	75	70
THERMAL PROPERTIES								
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	225	220	260	260	315
HDT/C	ISO 75-2/C	8 MPa	°C	-	-	-	-	175
HDT/B	ISO 75-2/B	0.45 MPa	°C	160	215	205	255	-
HDT/A	ISO 75-2/A	1.80 MPa	°C	60	205	66	250	280
FLAMMABILITY & ELECTRICAL PROPERTIES								
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	V2 (@0.4 mm)	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	550	600	500	600
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 SPRINT GFR 25 NC Q2C501	EPLAMID 6 SPRINT GFR 35 BK Q2D501	EPLAMID 6 SPRINT GFR 50 NC Q1F001	EPLAMID 66 SPRINT GFR 30 NC Q2D001
ABBREVIATION	ISO 1043	-	-	PA6-GF25	PA6-GF35	PA6-GF50	PA66-GF30
COLOUR	-	-	-	NATURAL	BLACK	NATURAL	NATURAL
DENSITY	ISO 1183	23°C	g/cm3	1.30	1.40	1.57	1.36
FILLER CONTENT	Epsan Int.	-	%	25	35	50	30
HUMIDITY ABSORPTION(EQUILIBIRIUM)	ISO 62	-	%	2.2	1.8	1.4	1.9
WATER ABSORPTION(SATURATION)	ISO 62	-	%	7.2	6	4.5	5.5
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.5/0.8	0.3/0.5	0.2/0.3	0.4/0.8
MECHANICAL PROPERTIES for D.A.M Conditions							
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	8300	11000	17000	10600
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	165	175	225	190
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	3	2.5	3	3
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	7500	9600	14500	9600
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	260	270	335	305
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	10	11	15	11
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	60	75	90	70
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	11	12	16	12
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	65	80	95	75
THERMAL PROPERTIES							
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	220	220	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	215	215	215	255
HDT/A	ISO 75-2/A	1.80 MPa	°C	205	205	210	250
FLAMMABILITY & ELECTRICAL PROPERTIES							
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	550	500	500	500
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+13	1.00E+13	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100

Eplamid Sprint Product Range

%80*
BETTER FLOW

* Compared to Standart Grades

Eplamid Sprint Product Range

UP TO %40*
SHORTER CYCLE TIME

*Depending on the material and applications

Eplamid Sprint Product Range

— **SMOOTHER SURFACE**

LOWER MOLDING TEMPERATURE

SHORTER CYCLE TIME

EASY DEMOLDING

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 66 GFS 40 MOS2 NC Q1E0A201	EPLAMID 66 TFL NC Q1C001	EPLAMID 66 GFT 30 NC Q1D0B501	EPLAMID 66 CFT 30 BK Q1B0C001	EPLAMID 66 GCF 30 BK Q1B5B501
ABBREVIATION	ISO 1043	-	-	PA66 GF40-MOS2	PA66 PTFE	PA66 GF30-PTFE	PA66 CF30-PTFE	PA66 (GF+CF)30
COLOUR	-	-	-	NATURAL	NATURAL	NATURAL	BLACK	BLACK
DENSITY	ISO 1183	23°C	g/cm3	1.45	1.26	1.48	1.32	1.32
FILLER CONTENT	Epsan Int.	-	%	40	-	30	30	30
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	1.6	2	1.5	1.7	2.1
WATER ABSORPTION(SATURATION)	ISO 62	-	%	4.7	6.8	4.7	5.5	5.8
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.5/0.8	1.5/1.6	0.4/0.8	0.6/0.8	0.2/0.6
MECHANICAL PROPERTIES for D.A.M Conditions								
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	13600	2700	10400	10100	16500
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	210	65	175	165	215
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	3	20	3	3	2
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	11000	2400	8000	8700	14500
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	270	95	245	235	340
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	14	4	13	7	9
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	90	98	80	50	50
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	15	5	14	8	10
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	95	105	85	55	55
THERMAL PROPERTIES								
MELTING POINT	ISO 11357/1-3	10 K/min	°C	260	260	260	260	260
HDT/B	ISO 75-2/B	0.45 MPa	°C	250	220	255	250	255
HDT/A	ISO 75-2/A	1.80 MPa	°C	240	85	250	245	245
FLAMMABILITY & ELECTRICAL PROPERTIES								
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	HB	HB	HB	HB	HB
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	-	-	-	-	-
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	-	-	-	-	-
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	600	600	600	100	150
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+14	1.00E+14	1.00E+14	1.00E+03	<1.00E+04
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100

PROPERTIES	STANDARTS	TEST CONDITIONS	UNITS	EPLAMID 6 GX0 30	EPLAMID 66 GX0 30	EPLAMID 66 MX0 40	EPLAMID 66 GX0 30 RP	EPIMIX PBT GX0 15	EPIMIX PBT GX0 30
ABBREVIATION	ISO 1043	-	-	PA6 GF30 FR(40)	PA66 GF30 FR(40)	PA66 MF40 FR(40)	PA66 GF30 FR(52)	PBT GF15 FR(40)	PBT GF30 FR(40)
COLOUR	-	-	-	BK/ORANGE	BK/ORANGE	BK	NATUREL	BK/ORANGE	BK/ORANGE
DENSITY	ISO 1183	23°C	g/cm3	1.4	1.41	1.55	1.37	1.44	1.57
FILLER CONTENT	Epsan Int.	-	%	30	30	40	30	15	30
HUMIDITY ABSORPTION(EQUILIBRIUM)	ISO 62	-	%	1.5	1.5	1.3	1.5	0.1	0.2
WATER ABSORPTION(SATURATION)	ISO 62	-	%	5	4.6	3.8	4.6	0.4	0.4
MOLD SHRINKAGE - PARALLEL / NORMAL	ISO 294-4	2 mm	%	0.4/0.7	0.3/0.5	0.5/1.0	0.3/0.5	0.3/1.0	0.3/1.0
MECHANICAL PROPERTIES for D.A.M Conditions									
TENSILE MODULUS (1 mm/min)	ISO 527-2	23°C	MPa	11000	10800	7000	10000	6000	10000
TENSILE STRESS AT BREAK (5 mm/min)	ISO 527-2	23°C	MPa	125	130	110	155	80	110
TENSILE STRAIN AT BREAK (5 mm/min)	ISO 527-2	23°C	%	2.5	2.5	2.5	3	3	2
FLEXURAL MODULUS (2 mm/min)	ISO 178	23°C	MPa	10000	10000	7500	9000	5000	9100
FLEXURAL STRENGTH (2 mm/min)	ISO 178	23°C	MPa	220	215	150	200	140	165
NOTCHED IZOD IMPACT	ISO 180/1A	23°C	kJ/m ²	7	8	3	10	6	7
UNNOTCHED IZOD IMPACT	ISO 180/1U	23°C	kJ/m ²	50	48	30	60	40	55
NOTCHED CHARPY IMPACT	ISO 179/1eA	23°C	kJ/m ²	8	9	4	11	7	8
UNNOTCHED CHARPY IMPACT	ISO 179/1eU	23°C	kJ/m ²	55	60	35	65	50	60
THERMAL PROPERTIES									
MELTING POINT	ISO 11357/1-/3	10 K/min	°C	220	260	260	260	225	225
HDT/B	ISO 75-2/B	0.45 MPa	°C	215	250	225	245	220	220
HDT/A	ISO 75-2/A	1.80 MPa	°C	210	245	210	235	205	205
FLAMMABILITY & ELECTRICAL PROPERTIES									
FLAMMABILITY CLASSIFICATION	EN 60695-11-10 / UL94	0.8 mm	-	V0 (@0.8 mm)	V0 (@0.4 - @3.2 mm)	V0 (@1.6 mm)	V0 (@0.8 mm)	V0 (@0.8 mm)	V0 (@0.4 mm)
GLOW WIRE FLAMMABILITY INDEX - GWFI	EN 60695-2-12	-	°C	960 (@0.8 mm)	960 (@0.8 - @3.2 mm)	960 (@0.8 mm)	960 (@0.8 mm)	960 (@0.8 mm)	960 (@0.8 mm)
GLOW WIRE IGNITION TEMPERATURE - GWIT	EN 60695-2-13	-	°C	775 (@0.8 - @3.2mm)	775 (@1.6 mm)	800 (@0.8 mm)	775 (@0.8 mm)	-	750 (@0.8 mm)
COMPARATIVE TRACKING INDEX	EN 60112	SOLUTION A	V	650	650	500	600	425	500
SURFACE RESISTIVITY	ASTM D257	-	Ω/sq	1.00E+13	1.00E+14	1.00E+14	1.00E+14	1.00E+14	1.00E+14
FLAMMABILITY OF INTERIOR MATERIALS	ISO 3795 / FMVSS 302	-	mm/min	<100	<100	<100	<100	<100	<100

MOLDING GUIDE

PRE DRYING

Even if PBT is not hygroscopic, as polyamide is (and, to a lesser extent, as PPA is) all polymers obtained by polycondensation are moisture sensitive and so pre-drying is always recommended. Material that is not pre-dried to a reasonable moisture level (0.10-0.15% depending on specific material) can be degraded during processing causing surface defects, parts to be dimensionally instable and brittle. Below are the recommended drying temperatures and time periods in a desiccant dryer with more than one desiccant element.

For **PPA** 7 to 9 hours at **100-120 °C**
 For **PA6** and **PA66** 2 to 4 hours at **80-85 °C**
 For **PBT** 2 to 4 hours at **120-140 °C**

A few tips to ensure proper operation of the dryer:

- Ensure the thermocouple that regulates the temperature is placed immediately before the entry of the air into the dryer. There can be a significant temperature drop in the air-conveyance system.
- The temperature of the air flowing out of the dryer silo should not be more than 30°C lower than the air entering the system. If this is the case, you have insufficient air capacity.
- From time to time, monitor the dew point of the dry air to ensure the desiccant elements are functioning properly.
- Often, less air runs through the very bottom parts of a dryer silo. Therefore, it is recommended that you take the material out of the bottom of the dryer and feed back into the top when you start up your process.

MOULDING TEMPERATURES

Recommended Moulding Temperatures for PPA

Material	HT00	HT01	HT02	HT03
Pref. Melt Temp	300-330°C	300-325°C	300-320°C	265-300°C
Rear	310-325°C	305-325°C	305-320°C	280-290°C
Center	305-325°C	315-325°C	310-320°C	280-290°C
Front	320-325°C	320-330°C	320-325°C	285-290°C
Nozzle	320-330°C	320-330°C	320-330°C	285-300°C

Recommended Moulding Temperatures for PA6

Material	Zone 1 (Hopper)	Zone 2	Zone 3	Zone 4 (Nozzle)
Unfilled Grades	220-260°C	225-270°C	225-270°C	225-275°C
Impact M. Grades	220-265°C	225-260°C	225-265°C	230-275°C
Flame Ret. Grades	225-260°C	230-260°C	235-265°C	235-265°C
Reinforced Grades	240-280°C	240-290°C	240-290°C	240-295°C

Recommended Moulding Temperatures for PA66

Material	Zone 1 (Hopper)	Zone 2	Zone 3	Zone 4 (Nozzle)
Unfilled Grades	260-275°C	260-280°C	270-280°C	275-285°C
Impact M. Grades	260-280°C	260-280°C	270-280°C	275-285°C
Flame Ret. Grades	260-295°C	270-295°C	275-290°C	275-295°C
Reinforced Grades	270-290°C	270-295°C	270-295°C	275-295°C

Recommended Moulding Temperatures for PBT

Material	Zone 1 (Hopper)	Zone 2	Zone 3	Zone 4 (Nozzle)
Unfilled Grades	230-240°C	235-250°C	235-250°C	240-260°C
Impact M. Grades	220-235°C	225-240°C	225-240°C	235-255°C
Flame Ret. Grades	220-230°C	225-240°C	230-245°C	235-260°C
Reinforced Grades	235-260°C	240-260°C	250-265°C	260-270°C

TOOL TEMPERATURE

Mould temperature is always a compromise. Moreover, tool temperature should be as high as possible to give optimum crystallization, dimensional, good surface finish and excellent mechanical performance. On the other hand, lower tool temperature can significantly cut cycle time. Below are the recommended temperatures according to polymers.

- *For HT00, mold temp > 135 °C - oil heaters needed
- *For HT01, HT02, HT03, mold temp > 100 °C - water heated mold are OK
- *For Polyamide 6 and Polyamide 66, 80°C should be maintained as a minimum.
- *For reinforced grades values of 90-110°C are preferred.
- *For PBT, 80°C should be maintained as a minimum. For different grades values of 90-110°C are preferred

Screw diameter (mm)	Maximum rpm
20	150
30	100
40	70
50	60
60	50
70	40
80	35
>80	30

- For glassfibre reinforced compounds, the screw speed should be kept low. a rough indication is as follows. for Polyamides

Screw diameter (mm)	Maximum rpm
20	100
30	95
40	70
50	60
60	50
70	40
80	35
>80	30

- For glassfibre reinforced compounds, the screw speed should be kept low, a rough indication is as follows, for PBT

PRESSURE AND SPEED

- For Polyamides, injection pressure should generally be around 70 to 100 MPa.
- For PBT injection pressure should generally be around 70 to 100 MPa; this results in a minimum clamping force of the moulding machine in tonnes of 0.7 times the projected surface area in cm².
- Holding pressure is generally in the area of 90 MPa for Polyamides and 80 MPa for PBT.
- Back pressure should be kept to a practical minimum both for Polyamides and PBT.

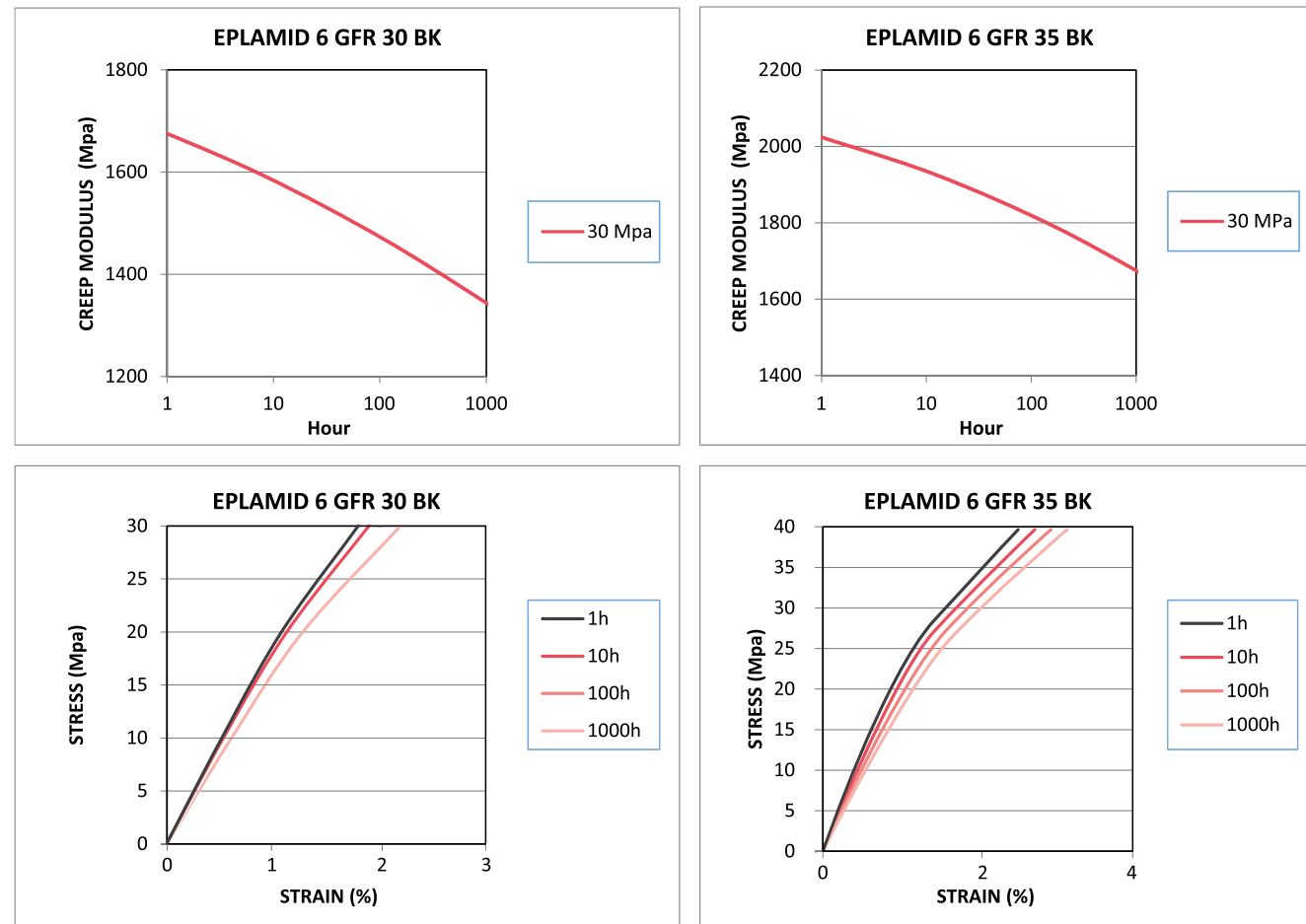
USE OF REGRIND

- Regrind sprues and runners can be used on most materials. It is not recommended to use regrind on FR grades. When regrind is used, observe these simple rules:
- Use a constant ratio of regrind and virgin material. When a material has been processed once, its viscosity and fibre length have been decreased. Using varying ratios of regrind can lead to variations in dimensions, mechanical performance and processing characteristics.
- Either feed the regrind straight back into the machine or pre-dry the regrind before usage.
- Store regrind in a dry, clean place to avoid contamination and excess moisture.
- Ensure sharp cutting blades to keep dust generation to a minimum; cut glass fibre reinforced material when it is still hot.
- Clean the grinder regularly to avoid build up of dust.
- Do not use splayed, discoloured or degraded parts and runners.

CREEP & FATIGUE BEHAVIOR

Creep indicates the behavior of plastics under persistent(constant) load. The graph of creep modulus versus time is affected by continuing stress.

As it can be seen from the graph of EPLAMID 6 GFR 30 BK, the value of the creep modulus decreases with the passing of the time. **Test Method : ISO 899-1**

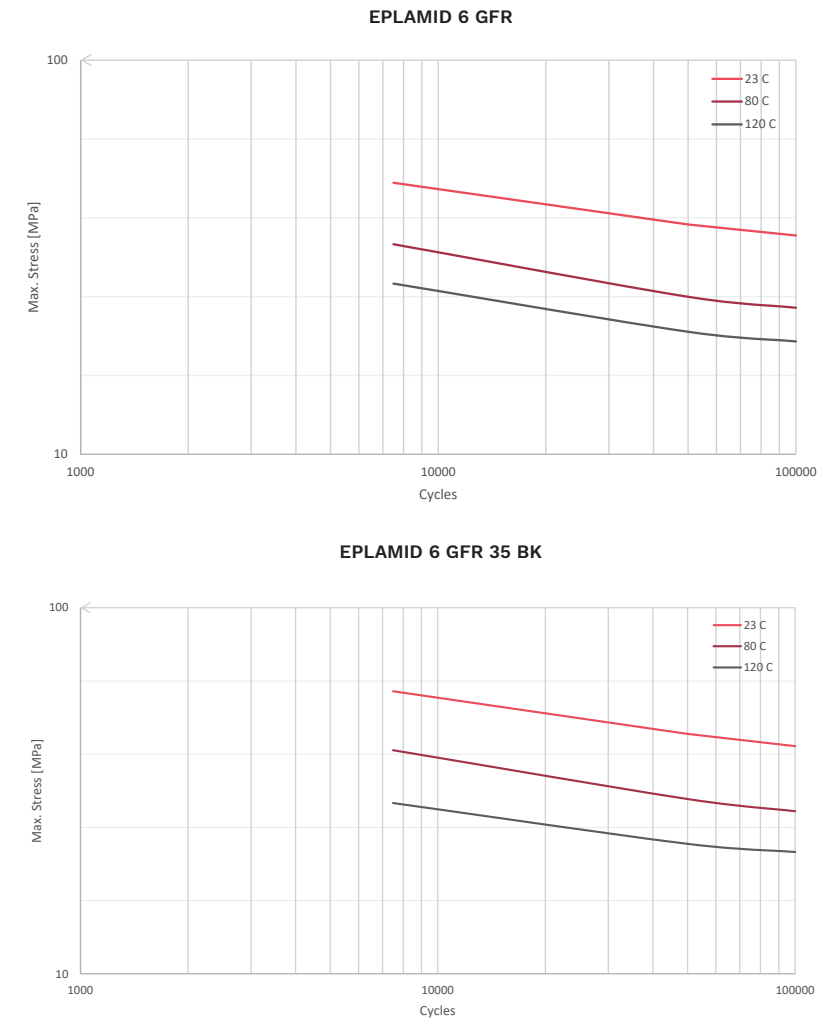


CREEP & FATIGUE BEHAVIOR

Fatigue is the weakening of a material caused by cyclic loading that results in progressive and localized structural damage and the growth of cracks.

Fatigue data provides an information about material behaviour when subjected to continuous cyclic loading.

Test Method : ISO 13003



LIGHTWEIGHT SOLUTIONS

In the near future, it is expected that the amount of plastic parts in the automotive industry will increase rapidly.

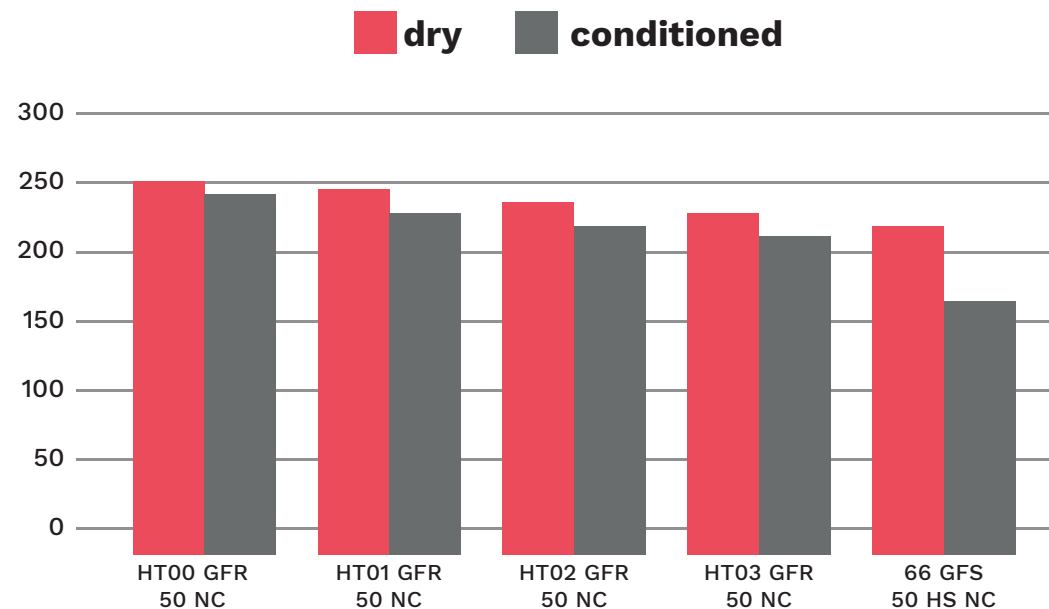
With this increase, studies on the exchange of metal components with plastics will accelerate in order to provide lightness.

Besides the lighter parts, metal substitution offers lower costs both on raw materials and production side.

So that, it is becoming more popular on some other industries such as sanitary installations and general machinery building etc.

Highly reinforced PA66, PPA and PA66/PPA blends are being widely used for metal replacement applications. One of the major advantages of PPA materials is, its low moisture absorption compared to most common used engineering plastic Polyamide. On the table below, you can see the tensile stress value comparison of PA66 GF 50 and different type of PPA GF 50 grades as conditioned and dry as moulded.

Conditioned: The equilibrium moisture content



Metal replacement is not the only way to reduce weights on the final parts. Also it is possible to offer lower density raw materials as alternatives to plastics. Below are the most common weight reductions methods:

- PA/PP BLENDS
- CARBON FIBER REINFORCEMENT

Polyamides and Polypropylenes are two totally different materials and usually it is not possible replace these two materials with each other.

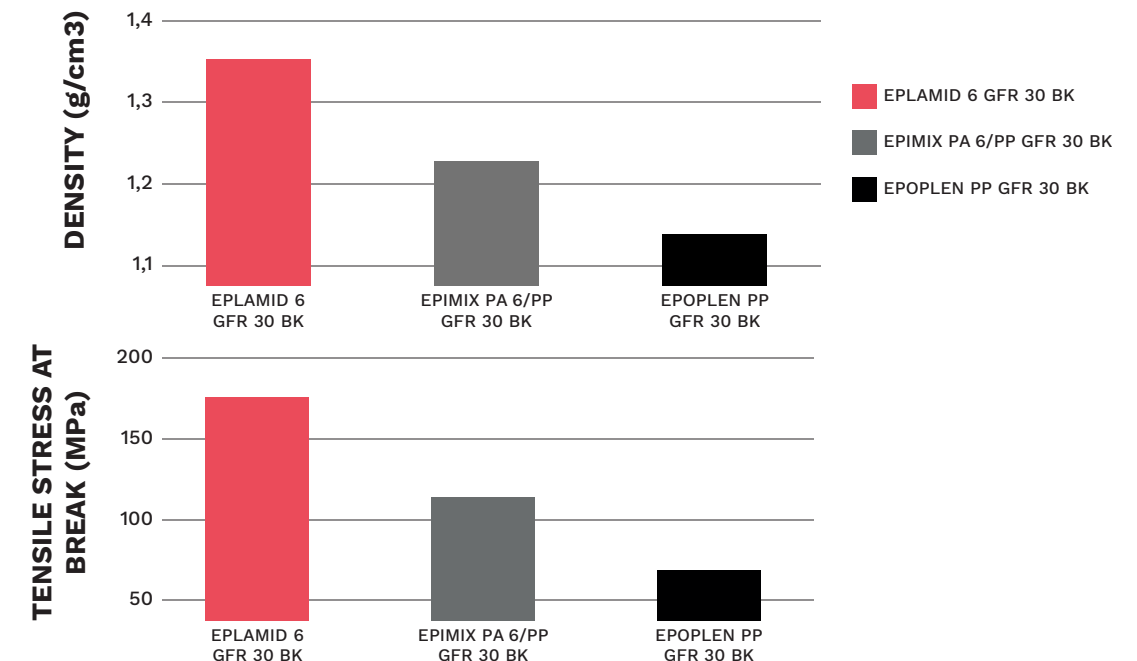
However, a good combination of these two materials can turn into a new alternative for many applications.

PP, among commodity plastics, has very good properties: it has good toughness and flexibility, wear resistance, flex fatigue, high temperature heat resistance, low moisture uptake, excellent chemical resistance, easy molding processability, low cost, etc.

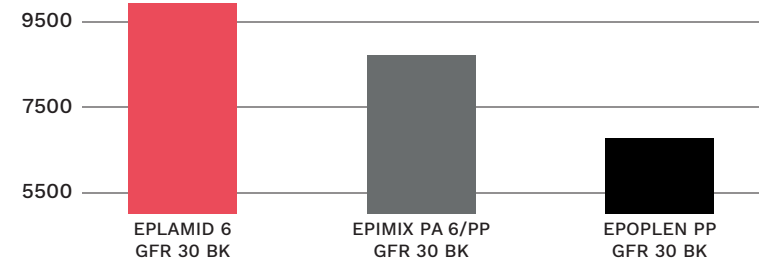
Nylon (PA6/PA66) has better mechanical and thermal properties but having many polar groups in the polymer chain it has a quite high moisture uptake (hygroscopic) and so lower dimensional stability.

PA6 and PP specific alloys can improve PP strength, PP reduces mold shrinkage and also affects processing properties: PA6 and PP have different melting points and processing temperatures for these alloys are higher than that of pure PP.

On below graphs you can see some property comparison between PA6 GF 30, PP GF 30 and PA6/PP GF 30 grades.

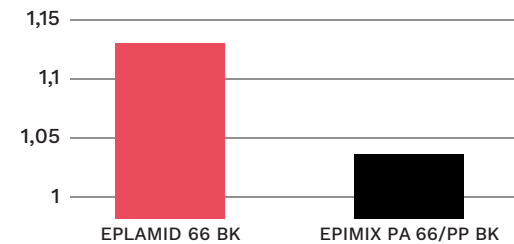


TENSILE MODULUS (MPa)

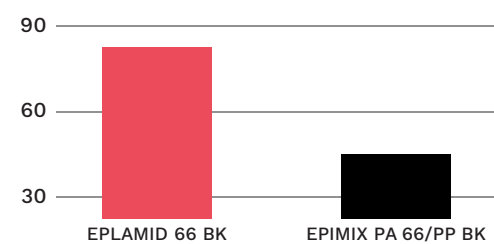


Herebelow are reported comparison graphics for unfilled PA66 and unfilled PA66/PP alloys.

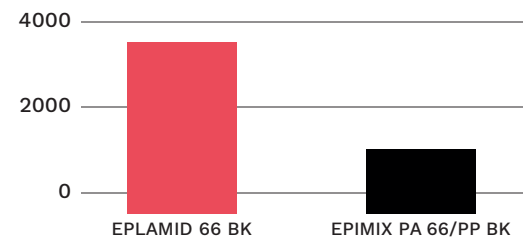
DENSITY (g/cm³)



STRESS AT BREAK (MPa)



TENSILE MODULUS (MPa)



CARBON & GLASS FIBER MIXTURES

Pure polymers performances can be improved and modified by using reinforcements like glass and carbon fibers. Generally glass fibers are used to improve mechanical properties with a cost advantage too.

With changing market trend towards lightweight and high performance; carbon fiber reinforced materials attract attention; even if the advantages of CF imply another cost.

As a solution reinforcing of these fibers together into Polyamide 6 and 66 compounds; we get feasible cost/performance ratio can be achieved.

On below tables you can see the advantages and disadvantages of both carbon and glass fiber reinforced grades.

Advantages of Glass Fibers	Disadvantages of Glass Fibers
Low cost	Higher density
Good tensile strength and modulus	Lower tensile properties than carbon fiber
Good impact resistance	

Advantages of Carbon Fibers	Disadvantages of Carbon Fibers
Lightweight	Low impact resistance
Greater stiffness and strength than glass fiber	Very high cost
Low thermal expansion coefficient	

Electrical conductivity

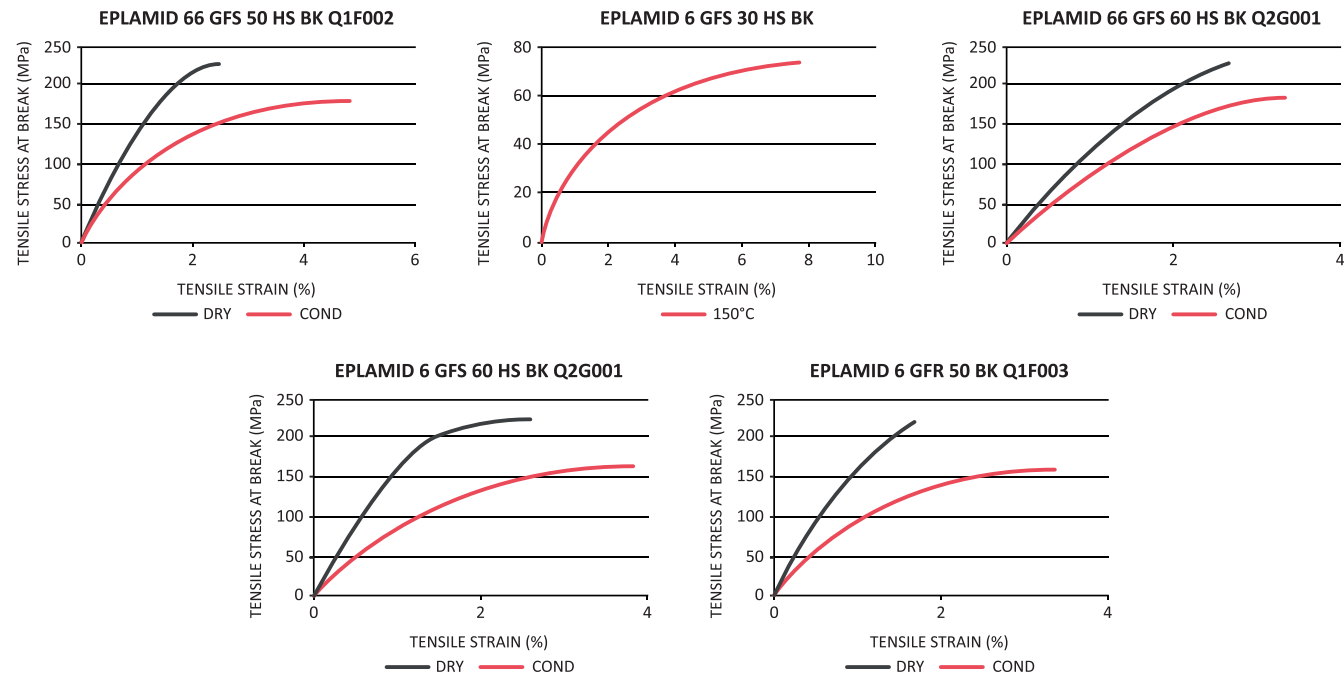
AUTOMOTIVE GRADES

Very high safety standards and quality expectations of end users in modern automotive engineering make high demands on the used materials.

Epsan offers high thermal stability, tensile strength, impact resistance and long-term performance with its PA, PBT and PPA grades.

Polyamide has a very good combination of mechanical properties (strength, rigidity and toughness) together with an excellent durability across a wide temperature range. These advantages can be attributed to the chemical structure of polyamide: strong hydrogen bridge bonds between polymeric chains yield a crystalline part with high strength thus allowing high operating temperatures while more flexible chains in the amorphous parts ensure high toughness.

In the following graphics stress - strain diagrams are shown for some of the most common used grades for automotive industry.



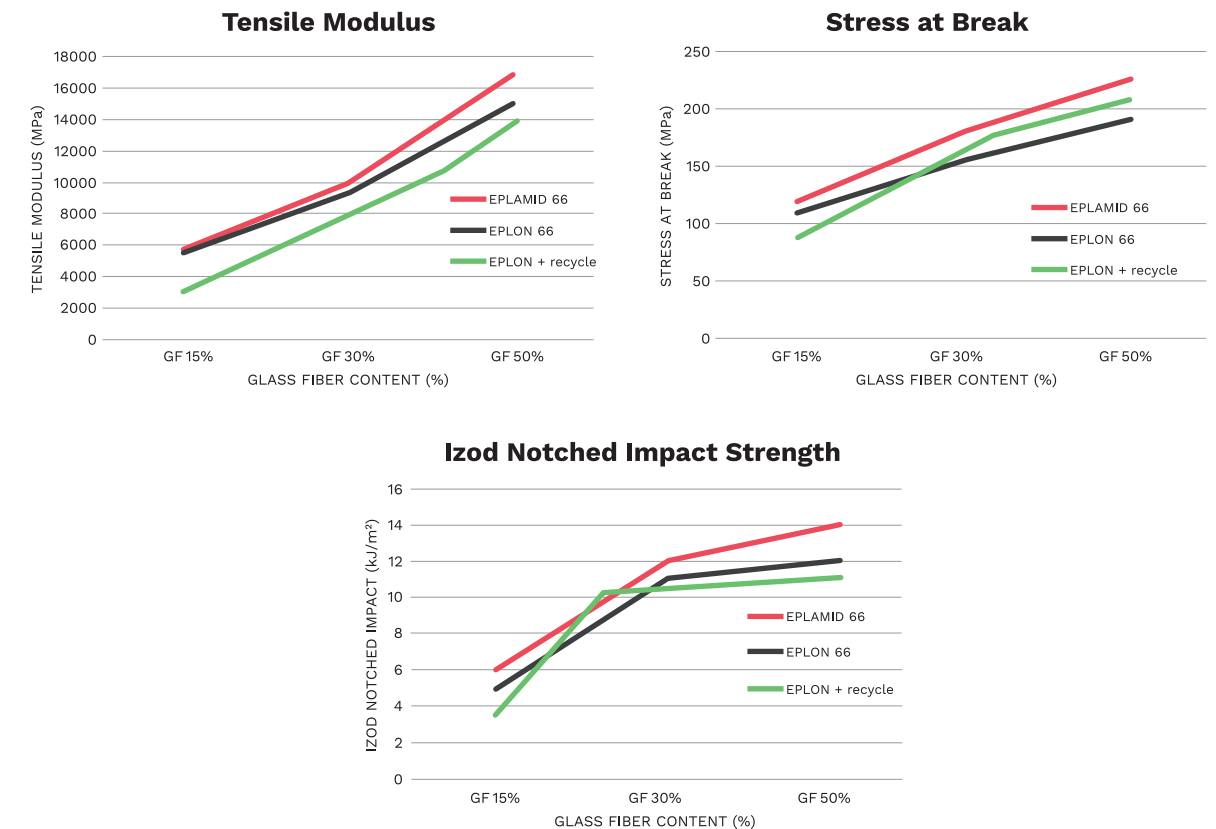
Conditioned: The equilibrium moisture content

EPLON+ RECYCLE

EPLON+ is the trade name of high performance PA6- PA66 recycled compounds produced from postindustrial fiber waste and polymerization waste of polyamide producers.

Thermal and mechanical properties are quite similar to primary PA compounds. The enhanced properties of EPLON+ grades make it a good alternative in many areas such as automotive, E&E and household appliances where resource efficiency, low carbon impact and the circularity terms becoming a common requirements along with technical specifications.

Each product offers ecological and durability solutions while offering the highest quality standards. Our goal is to create a value by reducing the environmental footprint of plastics and leave a better future for the next generations.



Product Character Type

EPLAMID	Virgin Polyamide
EPLON	Recycled Polyamide
EPLON+	High Performance Recycled PA
POLIAMID	Industrial Grade
EPIMIX	Polyesters and other materials
EPOPLEN	Polyolefin Groups

Group Name

6	Polyamide 6 Comp.
66	Polyamide 66 Comp.
66/6	6/66 Blend
66/6 CP	PA66-6 Copolymer
6 or 66 SPRINT	High Flow PA6 or PA66 Grades
HT	PPA Comp.
PA/PP	PA/PP Blends
PBT	PBT Comp.
PET	PET Comp.
PBT/PET	PBT/PET Blends
PBT/ASA	PBT/ASA Blends
TN	Transparent Nylon

Reinforcement Type

GFR	Glass Fiber
GFS	Glass Fiber (For EPLAMID 66: + Filler Ratio + "HS")
GFC	Glass Fiber + Glass Bead
GCF	Glass Fiber + Carbon Fiber
GV0	Glass Fiber + V0 + Halogenated
GV2	Glass Fiber + V2 + Halogenated
GX0	Glass Fiber + V0 + Halogen Free (For containing red phosphorus; GX0 + ratio + "RP")
GX2	Glass Fiber + V2 + Halogen Free
GX2	Glass Fiber + V2 + Halogen Free
GFU	Glass Fiber + UV (+Filler ratio + UVH, UVM, UVL)
GFH	Glass Fiber + Hydrolysis (+Filler ratio + HS)
GFM	Glass Fiber + Mineral
GFB	Glass Fiber + Glass Bubble
GBR	Glass Bubble
FWR	Scratch Resistant (Wear Resistant)
CBR	Glass Bead
CV0	Glass Bead + V0 + Halogenated
CV2	Glass Bead + V2 + Halogenated
CX0	Glass Bead + V0 + Halogen Free
CX2	Glass Bead + V2 + Halogen Free
CFR	Carbon Fiber
CFT	Carbon Fiber + PTFE
FV0	V0 Halogenated
FV2	V2 Halogenated
FX0	V0 Halogen Free
FX2	V2 Halogen Free
IMP	IMPACT
TFL	PTFE
MFR	Mineral

Reinforcement Type

MV0	Mineral + V0 Halogenated
MV2	Mineral + V2 Halogenated
MX0	Mineral + V0 Halogen Free
MX2	Mineral + V2 Halogen Free
AFR	Aramid Fiber
MOS2	MOS2 Additive
HV	High Viscosity
FW	Food and Water Contact
TC	Thermal Conductive
EC	Electrical Conductive
LM	Laser Marking

ABBREVIATIONS





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