

Metal replacement in automotive

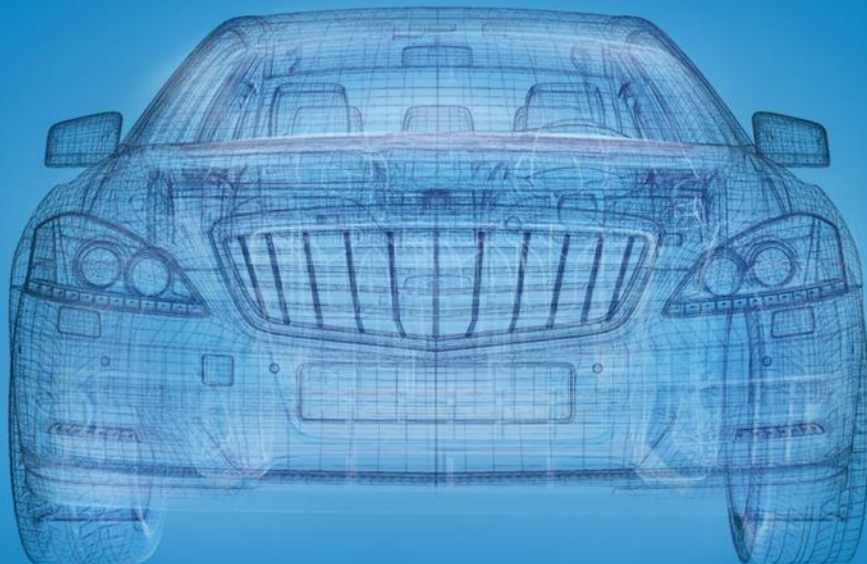
Interior 内饰

Exterior 外饰

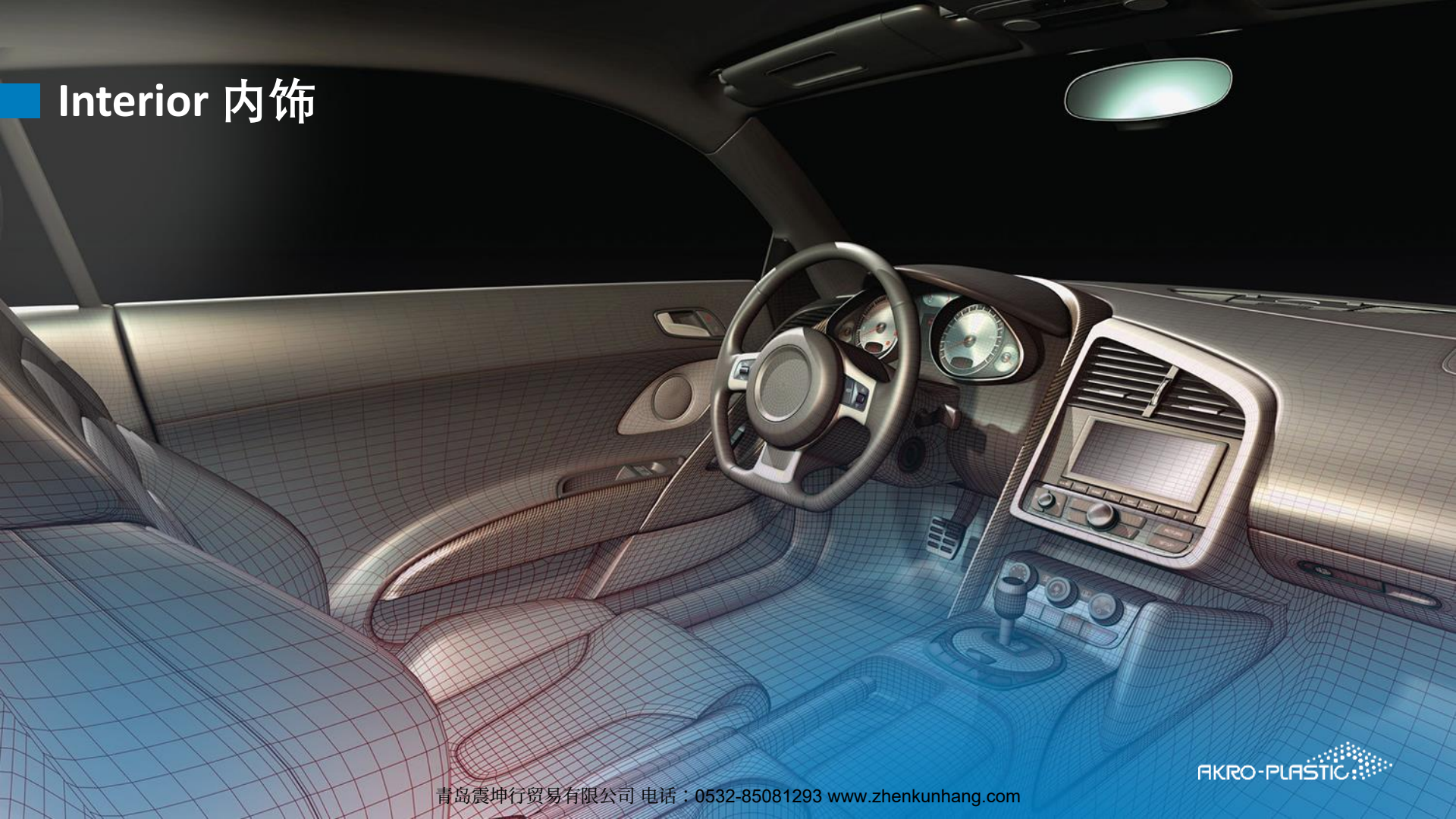
Chassis 底盘

Powertrain 动力总成

E&E 汽车三电



Interior 内饰



Interior-Cross-car beam cockpit 仪表板横梁 - PA6 GF60

Grade: Akromid B28 GF 60 9 black (4662)

OEM: Daimler new C/E class



PA6 – Polyamide 6 PA6 GF60

AKROMID® B28 GF 60 9 black (4662)

Tensile modulus
21000 MPa
1 mm/min
ISO 527-2

Stress at break
250 MPa
5 mm/min
ISO 527-2

Charpy impact strength
90 kJ/m²
23°C
ISO 179-1/1eU

AKROMID® B28 GF 60 9 black (4662) is a 60% glass fibre reinforced, process improved, easy flowing polyamide 6 with very high stiffness and strength as well as improved surface quality. Colored without carbon black.

Typical applications

Components in mechanical engineering and the automotive industry.



Mechanical Properties

Tensile modulus (1 mm/min ISO 527-2)	
d.a.m.	21000 MPa
conditioned	13500 MPa
Stress at break (5 mm/min ISO 527-2)	
d.a.m.	250 MPa
conditioned	160 MPa
Strain at break (5 mm/min ISO 527-2)	
d.a.m.	2,5 %
conditioned	3,5 %
Charpy impact strength (23°C ISO 179-1/1eU)	
d.a.m.	90 kJ/m ²
conditioned	95 kJ/m ²



Interior-Cross-car beam cockpit 仪表板横梁 – PA6-rCF30

Grade: Akromid B3 ICF 30 black (5119)
PIR carbon fiber reinforced PA6



LUCID
elringklinger
ENGEL



Interior-Wind deflector-天窗挡风条 PA6 GF50

Application: **Wind Deflector** (天窗挡风条)

Grade: Akromid B3 GF50 4 RM-M BK
(PA6+PBT GF50)

OEM: VW 270 (Polo + Derivate Seat, Skoda, etc.), VW 276
(Polo SUV + Derivate)

Ford C519 (Focus), Audi Q8 (AU 536), Audi 581 (A6),
AU 426 (Q5)

Requirement:

1: Very high stiffness

2: Good surface finish

3: Lower mechanical properties decrease after
water/moisture absorption comparing with standard PA6
GF50

吸水之后力学性能比普通的PA6 GF50降低的更少

4: Perform Interior Weathering Resistance Test per FLTM
BO 116-01 for interior materials approval

通过福特颜色耐久实验测试

青岛震坤行贸易有限公司 电话：0532-85081293 www.zhenkunhang.com



PA6 - Polyamide 6 PA6 + X GF50
AKROMID® B3 GF 50 4 RM-M black (3221)

16500 MPa Tensile ISO 527-2	210 MPa Tensile ISO 527-2	75 kJ/m² Impact ISO 179-1/1A
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AKROMID® B3 GF 50 4 RM-M black (3221) is a 50% glass fibre reinforced, chemical modified polyamide 6 with low humidity absorption and very good surface finish.

Typical applications
Housing and other dimensional stable parts in the automotive and electronic industry demanding high resistance against CaCl₂-salts, as well as a very good surface.

Mechanical Properties

Tensile modulus (2 mm/min) (ISO 527-2) 0.3 m conditioned	10000 MPa 15000 MPa
Stress at break (2 mm/min) (ISO 527-2) 0.3 m conditioned	210 MPa 200 MPa
Strain at break (2 mm/min) (ISO 527-2) 0.3 m conditioned	2.5% 2.7%
Flexural modulus (2 mm/min) (ISO 178) 0.3 m	10000 MPa



Interior-Center console bracket 中控骨架-PARA CF 40

Grade: Akroloy PARA ICF 40 black (6130)

Auto Tier 1: SMP

OEM: Porsche Taycan

Instead of a magnesium alloy 25% weight reduction



PARA – Polyarylamide PARA CF40

AKROLOY® PARA ICF 40 black (6130)

Tensile modulus

39000 MPa

1 mm/min

ISO 527-2

Stress at break

280 MPa

5 mm/min

ISO 527-2

Charpy impact strength

35 kJ/m²

23°C

ISO 179-1/1eU



Interior-The carrier holding the 12-inch information display

Grade: Akroloy PARA ICF 40 black (6130)

Auto Tier 1: HS Products Engineering GmbH

OEM: Lucid Motors-Air

Instead of a magnesium alloy



PARA – Polyarylamide PARA CF40

AKROLOY® PARA ICF 40 black (6130)

Tensile modulus

39000 MPa

1 mm/min
ISO 527-2

Stress at break

280 MPa

5 mm/min
ISO 527-2

Charpy impact strength

35 kJ/m²

23°C
ISO 179-1/1eU



Automotive Applications: Center Console Carrier for series production in AKROMID® U28 ICF 40 1 (8238)

- 3D-Printed center console carrier for series production
- SPE 2024 Grand AWARD Winner (BMW GROUP, Hans Weber Maschinenfabrik, AKRO)
- Advantages to injection molding solution
 - equal production cost
 - full plastic solution using sustainable materials
 - 20 % weight reduction
 - > 65 % reduction of CO₂-Footprint, parts & fasteners
 - high functional integration
 - Validated in simulation and test, thermal shock, fatigue, modal analysis, stiffness...



Interior-support arm for center rest





Carrying arm 座椅承载臂



Grade: Precite E ICF 30 black (7429)

OEM: BMW

Gas injection technology 气辅成型工艺
Instead of aluminum and 1/8 CO2 footprint
替代铝合金，碳足迹仅为1/8

STANDARDS/RECOMMENDATIONS/DIRECTIVES

Material: PRECITE® E ICF 30 schwarz (7429)

Process: VDA 277 and VDA 278

CONFIRMATION

Tests	Chap.	Unit	Result	Target value
Emission of organic compounds	VDA 277	µg C/g	2,6	-
critical substances				
Cyclohexane		µg/g	0,5	
1,4-Dichlorbenzene			0,3	≤ 0,6

Tests	Chap.	Unit	Result	Target value
Volatile and Condensable Emissions (Thermodesorption)	VDA 278			
Emissions VOC		µg/g	0,1	-
Emissions FOG			0,4	-

REPORT

A carbon footprint report is issued for the following product:

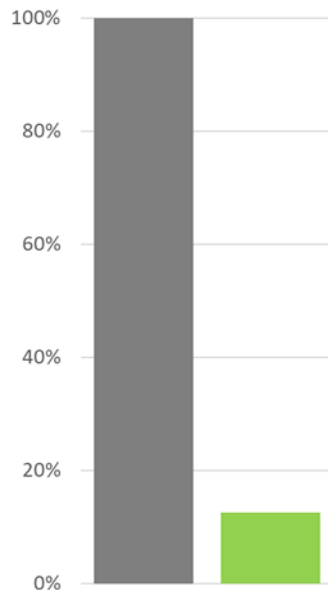
product	carbon footprint (kgCO ₂ eq/kg)
PRECITE® E ICF 30 black (7429)	2,1



Support for Center Armrest



Aluminum die-cast



- 87% CO₂eq/part
(without manufacturing
processes)



PRECITE® E ICF 30 black (7429)



Interior-Air vent 出风口叶片-PARA ICF 40

Grade: Akromid PARA ICF 40 black (6130)

Auto Tier 1: Dr. Schneider

OEM: BMW and Volvo

Extremely good surface finish and free of painting
优异的表面外观，免喷涂

PARA – Polyarylamide PARA CF40

AKROLOY® PARA ICF 40 black (6130)



Tensile modulus

39000 MPa

1 mm/min
ISO 527-2

Stress at break

280 MPa

5 mm/min
ISO 527-2

Charpy impact strength

35 kJ/m²

23°C
ISO 179-1/1eU

Interior-Adjust lever-方向盘调节手柄 PA6 GF50

Grade: Akromid B3 GF 50 black

OEM: VW/HONDA/FORD

PA6 – Polyamide 6 PA6 GF50

AKROMID® B3 GF 50 black (6740)

Tensile modulus

16200 MPa

1 mm/min
ISO 527-2

Stress at break

235 MPa

5 mm/min
ISO 527-2

Charpy impact strength

100 kJ/m²

23°C
ISO 179-1/1eU

AKROMID® B3 GF 50 black (6740) is a 50% glass fibre reinforced, high flow polyamide 6 with very high rigidity and strength

Typical applications

Components in mechanical engineering and in the automotive industry



Mechanical Properties

Tensile modulus (1 mm/min | ISO 527-2)

d.a.m.	16200 MPa
conditioned	10000 MPa

Stress at break (5 mm/min | ISO 527-2)

d.a.m.	235 MPa
conditioned	145 MPa

Strain at break (5 mm/min | ISO 527-2)

d.a.m.	3,0 %
conditioned	4,5 %

Flexural modulus (2 mm/min | ISO 178)

d.a.m.	14900 MPa
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A person is captured mid-jump, clearing a red shipping container. The background is filled with stacks of various colored shipping containers (blue, red, orange, yellow) under a clear blue sky. The person is wearing dark clothing and is positioned in the center of the frame, above the red container.

Exterior 外饰

AKRO-PLASTIC GmbH
Ein Unternehmen der Feddersen-Gruppe

AKRO-PLASTIC

青岛震坤行贸易有限公司 电话：0532-85081293 www.zhenkunhang.com

Exterior-Roof rail with water injection molding-PA6 GF50

Grade: Akromid B28 GF 50 1 GIT black

Auto Tier 1: MINTH

OEM: Hyundai

高刚性, 适用于水辅成型, 低结晶温度

High stiffness, water injection and lower crystallization temp.



Exterior-Mirror bracket 后视镜支架 - PA6 GF50

Application	Mirror plate
OEM	VW, Audi, Seat, Skoda, Tesla
Model	Neo, Audi E6/B10/C9, Y model
Product	AKROMID® B3 GF 50 black
SOP	2019

CUSTOMER

Customer	SMR Automotive Mirror Technology Manga
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VALUES

- Cost saving-PA66 GF 50 replacement
- PA6 GF50 替代 PA66 GF50
- Better flowability and surface quality



Chassis 底盘



Chassis-Air spring-空气弹簧- PA6 GF50

Grade: Akromid B25 GF 50 LA black (8280)

OEM: Geely/Xpeng/Lotus



AKROMID® PRELIMINARY

B25 GF 50 LA black (8280)

PA6 GF50

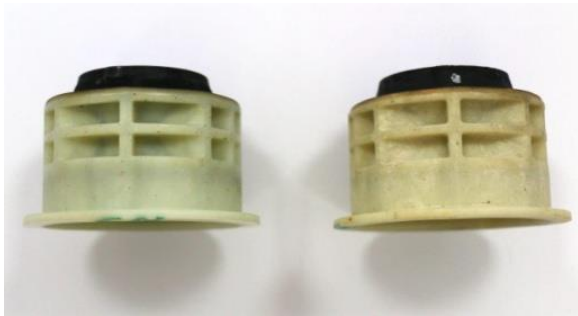
AKROMID® B25 GF 50 LA black (8280) is a 50% glass fibre reinforced, heat stabilised, easy flowing polyamide 6 with very high stiffness and strength. lasermarkable



Chassis-Mount outer sleeve-元宝梁衬套- PA66 GF50

Grade: Akromid A3 GF 50 1 natural (1259)

OEM: GM



PA6.6 – Polyamide 6.6 PA66 GF50

AKROMID® A3 GF 50 1 natural (1259)



Tensile modulus

16700 MPa

1 mm/min

ISO 527-2

Stress at break

250 MPa

5 mm/min

ISO 527-2

Charpy impact strength

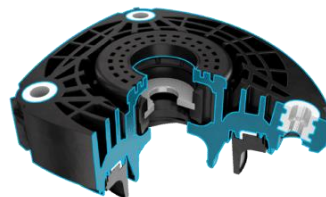
105 kJ/m²

23°C

ISO 179-1/1eU

Chassis-Top mount-上支撑- PA66 GF50

Grade: Akromid A28 GF 50 9 black (5030)



PA6.6 – Polyamide 6.6 PA66 GF50

AKROMID® A28 GF 50 9 black (5030)

Tensile modulus

16000 MPa

1 mm/min
ISO 527-2

Stress at break

250 MPa

5 mm/min
ISO 527-2

Charpy impact strength

100 kJ/m²

23°C
ISO 179-1/1eU

Chassis-Strut bearing平面轴承-PA66 or PA6 GF 50/GF 60

Grade: Akromid A28 GF 50 9 black (5030)
Akromid B28 GF 60 9 black (4662)
Akromid B28 GF 50 1 GIT black (4732)

平面轴承上盖用材-Bearing cap

PA66 GF25/GF30

PA6 GF30/GF35

平面轴承下盖用材-Bearing holding ring

PA66 GF30 + 金属嵌件注塑

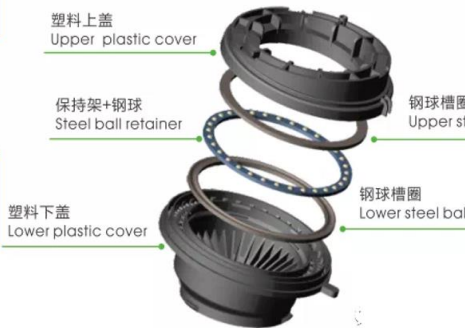
PA66 GF35 + 金属嵌件注塑

PA66 GF50

PA6 GF50/GF60

轴承保持架-Ball bearing

PA66 GF25/GF30, PA6 GF35



材料命名标准
ISO1043
GB/T 1844-2022

Powertrain 动力总成



AKRO
COMPOUNDS

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Powertrain-Clutch pedal-离合器踏板-PA6 GF 60

Grade: Akromid B3 GF 60 1 black

OEM: FORD



PA6 – Polyamide 6 PA6 GF60

AKROMID® B3 GF 60 1 black (4644)

Tensile modulus

21000 MPa

1 mm/min
ISO 527-2

Stress at break

250 MPa

5 mm/min
ISO 527-2

Charpy impact strength

90 kJ/m²

23°C
ISO 179-1/1eU

Powertrain-Brake pedal 刹车踏板- PA6 GF 60

Grade: Akromid B3 GF 60 1 black (4644)



PA6 – Polyamide 6 PA6 GF60

AKROMID® B3 GF 60 1 black (4644)

Tensile modulus

21000 MPa

1 mm/min
ISO 527-2

Stress at break

250 MPa

5 mm/min
ISO 527-2

Charpy impact strength

90 kJ/m²

23°C
ISO 179-1/1eU

Powertrain-Engine mount 悬置- PA66 GF50

Grade: Akromid A28 GF 50 9 black (5030)



PA6.6 – Polyamide 6.6 PA66 GF50

AKROMID® A28 GF 50 9 black (5030)

Tensile modulus

16000 MPa

1 mm/min
ISO 527-2

Stress at break

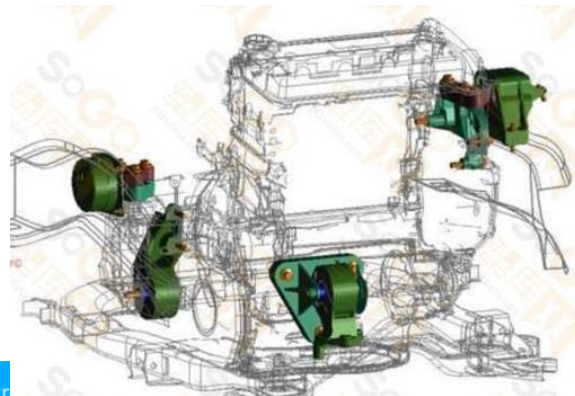
250 MPa

5 mm/min
ISO 527-2

Charpy impact strength

100 kJ/m²

23°C
ISO 179-1/1eU



Powertrain-crossmember transmission 变速箱横梁-PA6 GF 60

Application
OEM

Cross member
Benz C/E/S

PA6 – Polyamide 6 PA6 GF60

AKROMID® B3 GF 60 1 black (4644)

Product

AKROMID® B3 GF 60

Tensile modulus

21000 MPa

1 mm/min
ISO 527-2

Stress at break

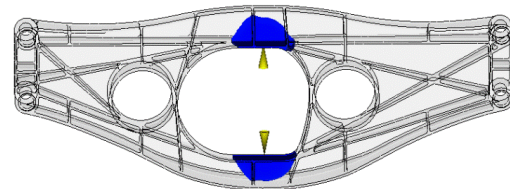
250 MPa

5 mm/min
ISO 527-2

Charpy impact strength

90 kJ/m²

23°C
ISO 179-1/1eU



<https://akro-plastic.com/en/news/spe-award-2022>

Powertrain-Crossmember transmission 变速箱横梁-PA66 CF 40

Grade: Akromid A3 ICF 40 black (5116)

OEM: Audi



<https://akro-plastic.com/en/applications/cross-member>

PA6.6 – Polyamide 6.6 PA66 CF40

AKROMID® A3 ICF 40 black (5116)

Tensile modulus

33000 MPa

1 mm/min

ISO 527-2

Stress at break

270 MPa

5 mm/min

ISO 527-2

Charpy impact strength

60 kJ/m²

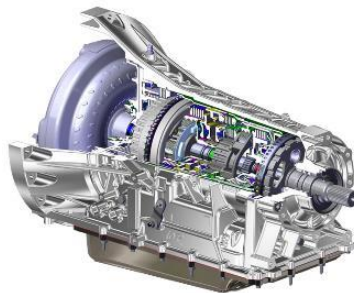
23°C

ISO 179-1/1eU

Powertrain-Transmission oil pan油底壳-PA66 LGF 50

Grade: Akromid A28 LGF 50 9 black (7705)

OEM: Ford



A28 LGF 50 9 black (7705)

PA66 LGF50

AKROMID® A28 LGF 50 9 black (7705) is an easy flowing PA6.6 with 50% long glass fibre reinforcement which leads to an extraordinary high stiffness and strength even at high temperature. The material distinguishes itself due to its isotropic mechanical properties as well as increased creep resistance and higher heat deflection temperature. The excellent fatigue performance, high energy absorption in the event of a crash and low shrinkage make it the product of your choice for technical parts e.g. oil pan.

Powertrain-Fuel filter燃油滤清器-PA6 GF/CF

Grade: Akromid B3 CGM 6/20 black (4362)
Akromid B3 CGM 15/20 1 LA black (8058)

OEM: BMW



PA6 – Polyamide 6 PA6 CF6 + GF20

AKROMID® B3 CGM 6/20 black (4362)

Tensile modulus

11000 MPa

1 mm/min

ISO 527-2

Stress at break

175 MPa

5 mm/min

ISO 527-2

Charpy impact strength

60 kJ/m²

23°C

ISO 179-1/1eU



Powertrain- Quick connector fuel line燃油管接头-PA612 GF/CF

Grade: Akromid D3 CGM 15/20 S1 black (6284)

OEM: VW



PA6.12 – Polyamide 6.12 PA6.12 CF15 + GF20

AKROMID® D3 CGM 15/20 S1 black (6284)

Tensile modulus

13500 MPa

1 mm/min
ISO 527-2

Stress at break

145 MPa

5 mm/min
ISO 527-2

Charpy impact strength

80 kJ/m²

23°C
ISO 179-1/1eU

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Powertrain- spindle nut 主轴螺母-PA/PPA CF 30/CF 40

Grade: Akroloy PA ICF 40 black (5270)
Akroloy PA ICF 30 black (5269)
Akromid T5 GF 50 black (6247)

OEM: Various



PA6.6 – Polyamide 6.6 PA66 + PA6I/6T CF40

AKROLOY® PA ICF 40 black (5270)

Tensile modulus

35000 MPa

1 mm/min
ISO 527-2

Stress at break

255 MPa

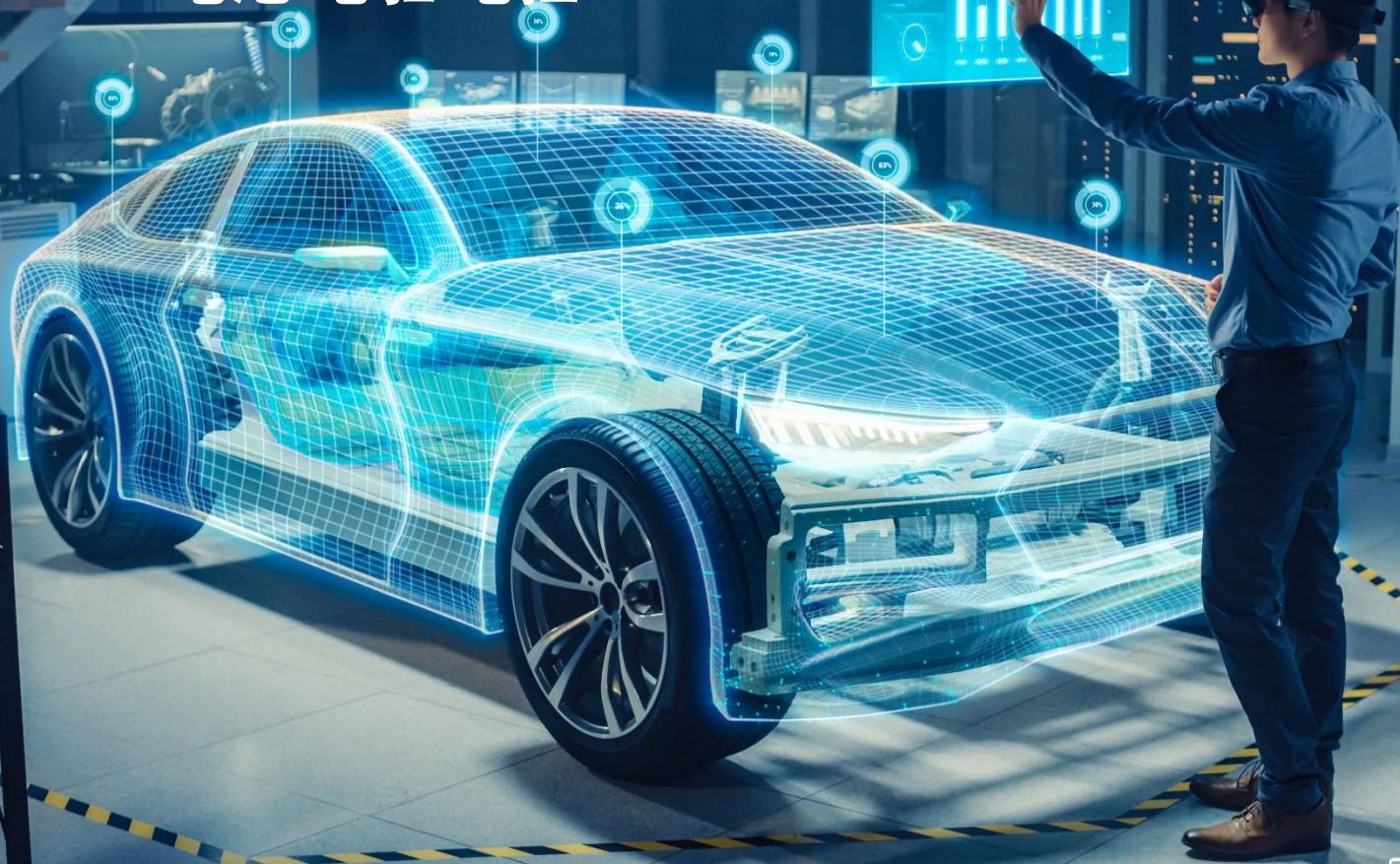
5 mm/min
ISO 527-2

Charpy impact strength

50 kJ/m²

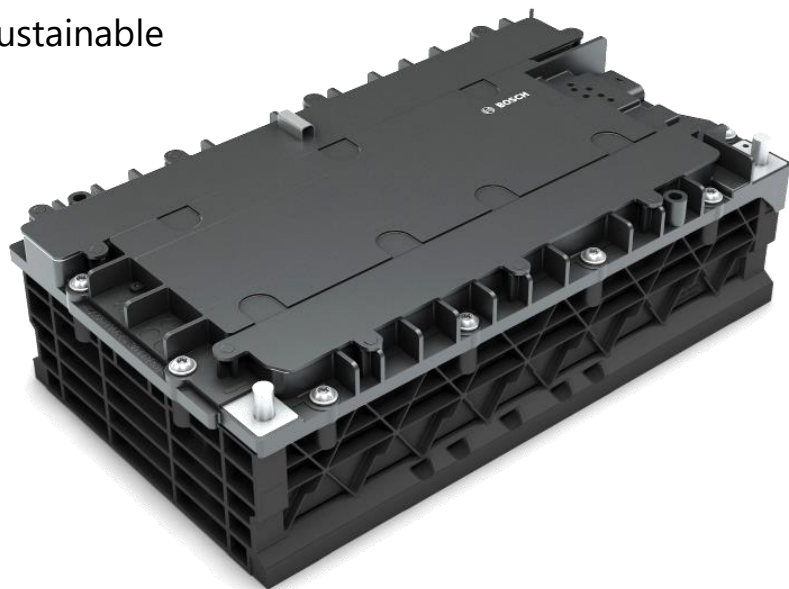
23°C
ISO 179-1/1eU

Auto E&E 电池·电驱·电控



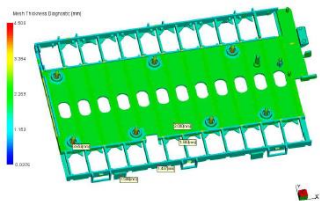
Cell Housing 48V Battery for Hybrid Cars

- current series materials are PA66 or PA6 glass fiber reinforced & flame-retardant
- mechanical recycled materials frequently contain small impurities that can severely impair flame retardancy, which represents too high a safety risk
- biobased or biomass-balanced polymers can provide a sustainable option with a controlled virgin quality
- materials choice is restricted by complex requirements:
 - flame-retardancy
 - certain media resistance
 - crash & creep behavior
 - service-life of >10,000 h



E&E- 48V cell housing and electric housing-PA6 GF 35 (FR40)

Grade: **AKROMID® B28 GF 35 FR EN black (7485)**



PA6 – Polyamide 6 PA6 GF 35 FR(40)

AKROMID® B28 GF 35 FR-EN black (7485)

Tensile modulus

12600 MPa

1 mm/min
ISO 527-2

Stress at break

157 MPa

5 mm/min
ISO 527-2

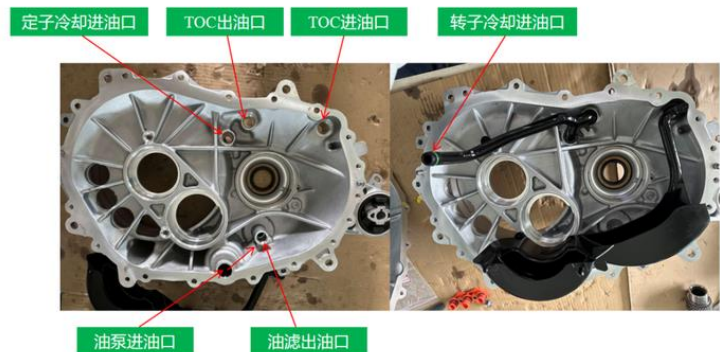
Charpy impact strength

66 kJ/m²

23°C
ISO 179-1/1eU

E&E- Oil transition pipes油管-B3 GM20-10 WIT

Grade: AKROMID® B3 GM20-10 1 WIT black (8139)



PA6 – Polyamide 6 PA6 GF20 GB10

AKROMID® B3 GM 20/10 1 WIT black (8139)

Tensile modulus

7400 MPa

1 mm/min

ISO 527-2

Stress at break

140 MPa

5 mm/min

ISO 527-2

Charpy impact strength

69 kJ/m²

23°C

ISO 179-1/1eU

E&E- Charging socket 充电座-PA66/PPA GF 60

Grade: AKROLOY® PA GF 60 black (6418)



PA6.6 – Polyamide 6.6 PA66 + PA6I/6T GF60

AKROLOY® PA GF 60 black (6418)

Tensile modulus

21000 MPa

1 mm/min

ISO 527-2

Stress at break

275 MPa

5 mm/min

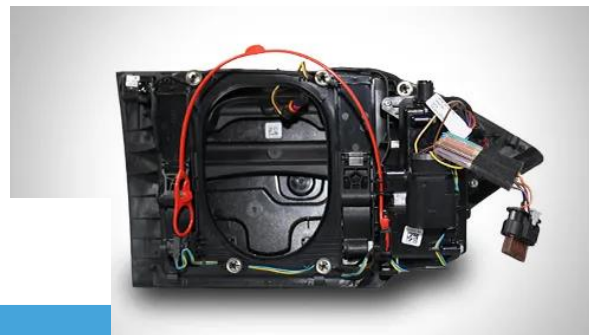
ISO 527-2

Charpy impact strength

100 kJ/m²

23°C

ISO 179-1/1eU



Thank you for your attention!



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