

**HUNTSMAN**

Enriching lives through innovation

# Automotive Parts manufacturing Selector guide



As today's auto manufacturers turn to lightweight materials that maintain vehicle strength and stiffness while reducing weight and also support design freedom and flexibility, Huntsman Advanced Materials products are playing an ever-growing role. Automakers worldwide use our SL photopolymers and machinable boards for concept design, rapid-setting polyurethanes for prototypes, resin systems for parts ranging from body panels to chassis, and adhesives for durable component assembly.

## Tooling boards

Product designation	Colour	Density	Hardness	Barcol-Hardness	Compres. Strength	Compres. Modulus	Coefficient of Thermal Expansion	HDT	Comments
Conditions								1.8 MPa	
Norm			ISO 868		ISO 604	ISO 604	ISO 11359	ISO 75	
Unit		(g/cm <sup>3</sup> )	(Shore D)		(MPa)	(MPa)	(10 <sup>-6</sup> K <sup>-1</sup> )	(°C)	

### Polyurethane

RenShape® BM 5066	Beige	1.1	75-80	-	55-60	-	55-60	-	Foundry tools, jigs and fixtures
RenShape® BM 5112	Grey	1.5	80-85	-	50-60	2 400-2 800	80-90	85-90	Hammer forms and flanging tools
RenShape® BM 5166	Ivory	1.7	85-90	30-35	90-100	7 000-7 500	45-50	75-80	Sheet metal forming tools, hammer forms

### Epoxy

RenShape® BM 5050	Blue	0.72-0.74	72-74	-	55-61	2 600-2 700	40-45	120	Lay-up tools for prepregs, cubing models, vacuum forming tools
RenShape® BM 5055	Green	0.72-0.75	75	-	50-55	2 300-2 400	35-45	135-140	Lay up tools for prepregs, vacuum forming moulds

## Board bonding adhesives

Product designation	Adhesives	Reparation system
RenShape® BM 5055	RenGel® SW 18 / Ren® HY 5159	Repair with adhesive bonded insert
RenShape® BM 5066	Araldite® AW 106 / HV 953U	Repair with adhesive bonded insert
RenShape® BM 5172	Araldite® AW 106 / HV 953U	Repair with adhesive bonded insert
RenShape® BM 5112	Araldite® AW 106 / HV 953U	AW 2101, HW 2951
RenShape® BM 5166	Araldite® AW 106 / HV 953U	Araldite® AW 5306, HV 5309-1 RenPIM® 5219 A/B, 5217 B, DT 082
RenShape® BM 5266	Araldite® AW 106 / HV 953U	RenPIM® 5219 AB, 5217 B, DT 078

## Net size casting

Product designation	Colour	Mix Ratio	Pot Life	Density	Hardness Shore	Compres. Strength	E-Modulus	Coef. of Thermal Expansion	Castable Layer Thickness	Comments
Conditions			RT / 3 kg							
Norm					ISO 868	ISO 604	ISO 604	ISO 11359	Shrink < 1 mm/m	
Unit		(pbw)	(min)	(g/cm <sup>3</sup> )	(Shore D)	(MPa)	(MPa)	(10 <sup>-6</sup> K <sup>-1</sup> )	(mm)	
RenCast® 5146 A / RenCast® 5146 B	Light beige	80:100	20-30	1.2	80	85-90	3 000	100	20	Low viscosity, long pot life
RenCast® 5146 A / RenCast® 5146 B / Cast Iron Powder	Dark Grey	80:100:550	30-40	3.3	90	115-120	10 000	45-50	200	For metal like parts (max. exotherm 60°C)
RenCast® 5146 A / RenCast® 5146 B / Filler DT 081	Grey	80:100:110	30-40	1.9	70-75	65	4 500	40-50	100	Lower shrinkage (max. exotherm 60°C)
RenCast® 5146 A / RenCast® 5146 B / Filler DT 082	Light beige	80:100:330	30-40	1.6	85	90-95	9 500	45	250	Variable filler content possible (max. exotherm 45°C)
RenCast® 5146 A / RenCast® 5146 B / Filler DT 082	Light Beige	80:100:420	30-40	1.85	85	100-105	10 500	40	300	Higher compressive strength, than unfilled system (max. exotherm 40°C)
RenCast® 5146 A / RenCast® 5146 B / Filler DT 082	White	80:100:600	30-40	1.8	85	75-80	10 000	40-45	-	Higher compressive strength, than unfilled system
RenCast® 5146 A / RenCast® 5146 B / Filler DT 082 / Aluminium Powder	Grey	80:100:330:40	30-40	1.8	85-90	95-100	10 000	45	200	Lower density metal like parts (max. exotherm 50°C)

## Brake bonding adhesives

Product designation	Colour	Solid Content	Application Method*	Solvent	Drying Time	Drying Time	Curing Pressure	Curing Temperature	Curing Time
Conditions					RT	70°C			
Norm									
Unit		% bw			(hr)	(min)	(MPa)	(°C)	(min)
<b>Araldite® 64-1</b>	Clear brown	39-44	Sp, Br, Rc	Ethanol / Toluene	6	25	0.35-1	200	5
<b>Araldite® 70</b>	Clear brown	38-44	D, Sp	Ethanol	20 min	5	-	200	5
<b>Araldite® 71</b>	Dark brown	47-51	Ex, Rc	Ethanol	8-10	25	0.35-1	200	5
<b>Resin XD 500</b>	Clear brown	39-43	Rc, Br, Sp	Ethanol / Acetone	2-4	5	0.35-1	200	5

\* D = Dip / Rc = Roller coat / Sp = Spray / Ex = Extruder / BR = Brush

## Structural adhesives

Product designation	Colour	Typ. Usable Life	Typ. Lap Shear Strength	Flexibility / Toughness	Chemical Resistance	Water / Humidity Resistance	Temp. Resistance Tg	Comments
Conditions		RT / 100 g	RT				DSC, 10 K/min	
Norm							IEC 1006	
Unit		(min)	(N/mm <sup>2</sup> )				(°C)	

### Epoxy

<b>Araldite® 2010</b>	Yellow	8	23	Impact resistant	Good	Good	40	Two component, fast 2 components epoxy paste adhesive with high shear and peel strength, bonds a variety of materials
<b>Araldite® 2014</b>	Grey	40	19	Rigid	Excellent	Excellent	85	Two component epoxy paste adhesive for bonding metal, wood
<b>Araldite® 2015</b>	Beige	40	18	Impact resistant	Good	Good	65	Two component thixotropic epoxy adhesive paste especially suited to bond SMC/BMC, rubber, wood, glass, ceramics

### Polyurethane

<b>Araldite® 2018</b>	Opaque	40	8	Flexible	Limited	Limited	-	Two component polyurethane adhesive for bonding SMC/BMC, metal, rubber, thermoplastics
<b>Araldite® 2027</b>	Beige	8	14	Flexible	Good	Good	23	Two component PU adhesive, thixotropic, for bonding SMC/BMC, metal, rubber, thermoplastics

### Methacrylate

<b>Araldite® 2021</b>	Yellow	3	22	Impact resistant	Good	Good	65	Two component methacrylate system with high toughness, for bonding GRP/SMC, thermoset composites, ABS/PVC, PC, PA, PS-foams
<b>Araldite® 2022</b>	Yellow	10	23	Impact resistant	Limited	Limited	45	Two component methacrylate system for bonding polyamides, thermoplastics, rubber

Product designation	Colour	Pot Life	Lap Shear Strength	Flexibility / Toughness	Chemical resistance	Water / Humidity resistance	Tg	Comments
Unit		(min)	(MPa)				(°C)	
<b>Agomet® F 310 AB</b>	Beige viscous paste	8-12 Agomet F 310:Hardener Powder (100g:3g)	20-30	High	Good	Good	54	Cold curing 2c methacrylate adhesive with rapid setting time, suitable for bonding variety of metal and plastic substrates. No-Mix process possible
<b>Agomet® F 330</b>	Beige liquid	11-15 Agomet F330:Hardener Powder (20g:0.6g)	30-35	High	Good	Good	45	Cold curing 2c methacrylate adhesive with enhanced thermal performance suitable for bonding variety of metal and plastic substrates. No-Mix process possible
<b>Agomet® F 347</b>	Beige to brown	18-10 Agomet F347:Hardener Powder (20g:0.6g)	18	High	Good	Good	55	Cold curing and gap filling 2c methacrylate adhesive with high toughness requiring minimal surface treatment, suitable for bonding metals and plastics. No-Mix process possible

## Parts in minutes

Product designation	Colour	Mix Ratio	Pot Life	Demould. Time	Max. Layer Thickness	Hardness	HDT*	Tens. Strength	Flex. Modulus	Comments
Conditions			RT / 100 g	RT			0.75 MPa			
Norm						ISO 868	ISO 75	ISO 527	ISO 178	
Unit		(pbw)	(s)	(min)	(mm)	(Shore D)	(°C)	(MPa)	(MPa)	

### Injection grade

RenPIM® 5212 / 5212	Neutral	100:60	100-120	15-20	4	55-65	45	15-25	650	Flexible, simulates HDPE
RenPIM® 5213-1 / 5213-1	Caramel	100:65	50-70	15-30	3	78-83	90	35-40	1 400	Flame retardant to UL94 VO, simulates PP/ABS
RenPIM® 5214 / 5214	Beige	100:80	60-80	10-15	4	75-80	120	30-50	1 775	High temperature resistance, pigmentable, simulates PP/ABS
RenPIM® 5215 / 5215	Black	100:80	40-60	10-15	4	75-80	130-140	30-40	1 100	High temperature resistance, simulates PP/ABS
RenPIM® 5216 / 5216	Neutral	100:80	40-60	15-20	5	75-80	80	30-35	1 200	Toughened, high impact resistance, pigmentable, simulates PP/ABS
RenPIM® 5217 / 5217	Black	100:80	40-60	10-15	5	75-80	85-90	35-40	1 250	Toughened, high impact resistance, simulates PP/ABS
RenPIM® 5218 / 5218	Black	100:80	100-130	20-30	4	75-80	90-100	40-45	1 900	High flexural modulus, toughened, simulates PP/ABS
RenPIM® 5219 / 5219	Neutral	100:80	40-60 min	16-18 hr	20	78-83	70-75	60-70	2 800	For adding to faster systems to reduce reaction rate, for casting thicker layers
RenPIM® 5220 / 5220	Black	100:120	45-70	15-20	4	70-80	up to 184	45-50	1 800	Temp. resistance to 180°C, simulates PP/ABS
RenPIM® 5221-1 / 5221-1	Black	32:100	45-55	15-20	4	70-74	58	30-40	350	High impact material for crash test parts, simulates PE (charpy impact 180 KJ/m²)

Product	Colour	Mix Ratio	Pot Life	Demould. Time	Max. Layer Thickness	Hardness	HDT	Tens. Strength	Flex. Modulus	Comments
Conditions			40°C / 100 g	70°C			0.75 MPa			
Norm						ISO 868	ISO 75	ISO 527	ISO 178	
Unit		(pbw)	(min)	(hr)	(mm)	(Shore D)	(°C)	(MPa)	(MPa)	

### Vacuum grade

RenPIM® VG 5281 / 5281	Light amber	100:25	5-10	2	10	40A	N/A	0.75	-	Low tack, good resilience pigmentable
RenPIM® VG 5281 / 5281	Light amber	100:30	5-10	2	10	50A	N/A	1.67	-	low tack, good resilience, pigmentable
RenPIM® VG 5282 / 5281	Light amber	100:35	5-10	2	10	60A	N/A	2.62	-	Low tack, good resilience, pigmentable
RenPIM® VG 5281 / 5281	Light amber	100:40	5-10	2	10	70A	N/A	4.29	-	Low tack, good resilience, pigmentable
RenPIM® VG 5181 / 5283 / 5281	Light amber	60:40:45	5-10	2	10	80A	N/A	5.98	-	Low tack, good resilience, pigmentable
RenPIM® VG 5281 / 5283 / 5281	Light amber	40:60:55	5-10	2	10	90A	N/A	12.88	-	Low tack, good resilience, pigmentable
RenPIM® VG 5283 / 5281	White	100:70	5-10	2	10	> 90A	N/A	22.41	441	Low tack, good resilience, pigmentable
RenPIM® VG 5284 / 5284	Amber, semi-transparent	32:100	13-16 (RT)	2	10	68	97*	25	660	High impact resistance, good temperature resistance
RenPIM® VG 5285 / 5285	Black	80:100	10*	0.75	10	80	120*	42	1400	High heat deflection, good flexibility
RenPIM® VG 5286 / 5286	Black	100:150	6	0.75	10	80	140*	70	2000	High heat resistance, ABS-like
RenPIM® VG 5287 / 5287	Clear transparent	100:150	4-5	2	10	80	116*	76	2400	Clear, transparent, UV stabilised, ABS-like
RenPIM® VG 5289 / 5289	Brown	100:90	5-6	2	10	78	84*	64	107	Flame retardant grade, FAR 25 and UL94 VO approved, ABS like
RenPIM® VG 5234 / 5234	White	30:100	6 (RT)	0.75	5	79	N/A	45	1450	Pigmentable, PP/ABS like

RT: Room Temperature = 23±2°C • \* Properties after post cure



# HUNTSMAN

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## EUROPE / MIDDLE EAST

Huntsman Advanced Materials  
(Switzerland) GmbH  
Klybeckstrasse 200  
CH-4057 Basel • Switzerland  
Tel + 41 61 966 33 33  
Fax + 41 61 966 33 34

## AMERICAS

Huntsman Advanced Materials  
Americas Inc  
Americas Customer Service Center  
10003 Woodloch Forest Drive  
The Woodlands • Texas 77380 • USA  
Tel +1 281 719 6000  
Fax +1 281 719 6416  
Fax +1 713 235 6416

## ASIA / PACIFIC

Huntsman Advanced Materials  
Shibakoen Ridge Bldg. 3F • 1-8-21  
Shibakoen Minato-ku  
Tokyo 105-0011 • Japan  
Tel + 813 5403 8195  
Fax + 813 5403 8186

E-mail:  
advanced\_materials@huntsman.com

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