

Automotive Design and prototype Selector guide

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

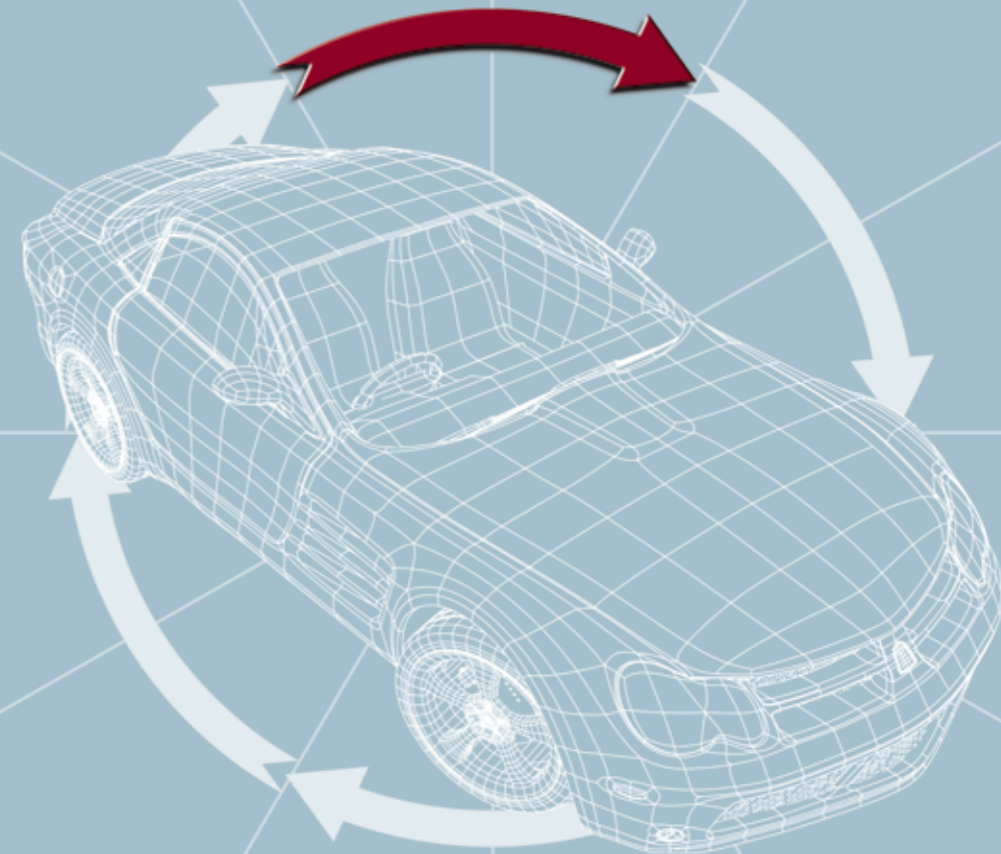
While all the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, nothing herein is to be construed as a warranty, express or otherwise.

In all cases, it is the responsibility of the user to determine the applicability of such information and recommendations and the suitability of any product for its own particular purpose. The sale of products referred to in this publication is subject to the general terms and conditions of sale of Huntsman Advanced Materials (Europe) BVBA or of its affiliated companies.

Aradur®, Araldite®, Ren®, RenCast®, RenGel®, RenLam®, RenPaste®, RenPIM®, RenShape®, RenTool® are registered trademarks of Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.

Copyright © 2008 Huntsman Advanced Materials (Switzerland) GmbH

Design: ZVCHUND_1142



Time to market demands are increasingly tight for design engineers in the global automotive industry. To be successful, it is critical to be first to market with the latest design innovation or the latest model.

With the broad range of flexibilities and properties available in our RenShape® Solutions line, we can quickly and economically provide our customers with functional prototypes to meet specific project requirements.

Modeling boards

Product designation	Colour	Density	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 ³)	(Shore D)	(MPa)	(MPa)	(10 ⁻⁶ K ⁻¹)	(°C)	
RenShape® BM 5108	White	0.08	-	-	-	-	-	Design studies, program proving, supporting structures
RenShape® BM 5025	Apricot	0.24	-	3.7	140	60-70	60	Styling, master and data control models, supporting structures, negative moulds for netsize casting
RenShape® BM 5185	Apricot	0.5	-	10-15	500-600	50-55	60-70	Styling, master models
RenShape® BM 5440	Brown	0.55	55-60	10-15	650-750	60-65	55-65	Master models, cubing models, patterns
RenShape® BM 5460	Brown	0.7-0.73	60-65	20-25	1 250-1 350	50-55	60-70	Master models, cubing models, patterns
RenShape® BM 70	Brown	0.7	60-65	15-20	950-1150	65-70	60-70	Master models, cubing models, patterns

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 604	ISO 604	ISO 11359	ISO 75			
Unit		(g/cm ³)	(Shore D)		(MPa)	(MPa)	(10 ⁻⁶ K ⁻¹)	(°C)	
RenShape® BM 5066	Beige	1.1	75-80	-	55-60	-	60-65	-	Foundry tools, jigs and fixtures
RenShape® BM 5112	Grey	1.5	80-85	-	50-60	2 400-2 800	95-105	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, control fixtures and jigs
RenShape® BM 5266	Dark grey	1.7	85-90	40-45	125-130	7 000-7 500	45-50	120-125	Metal forming tools

Polyurethane

RenShape® BM 5066	Beige	1.1	75-80	-	55-60	-	60-65	-	Foundry tools, jigs and fixtures
RenShape® BM 5112	Grey	1.5	80-85	-	50-60	2 400-2 800	95-105	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, control fixtures and jigs
RenShape® BM 5266	Dark grey	1.7	85-90	40-45	125-130	7 000-7 500	45-50	120-125	Metal forming tools

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	Adhesive	Reparation	Product designation	Adhesive	Reparation
RenShape® BM 5106	RenPaste® SV 36 / Ren® HY 5162	Repair with adhesive bonded insert	RenShape® BM 5055	RenGel® SW 16 / Ren® HY 5159	Repair with adhesive bonded insert
RenShape® BM 5025	RenCast® FC 52	XW 5184, XW 5130	RenShape® BM 5066	Araldite® AW 106 / Araldite® HV 953U	Repair with adhesive bonded insert
RenShape® BM 5185	RenCast® FC 52	XW 5184, XW 5130	RenShape® BM 5172	Araldite® AW 106 / Araldite® HV 953U	Repair with adhesive bonded insert
RenShape® BM 5440	RenPaste® SV 427-2 / RenPaste® HY 5162	XW 5184, XW 5130	RenShape® BM 5112	Araldite® AW 106 / Araldite® HV 953U	AW 2101, HW 2951
RenShape® BM 70	RenPaste® SV 427-2 / RenPaste® HY 5162	XW 5184, XW 5130	RenShape® BM 5166	Araldite® AW 106 / Araldite® HV 953U	Araldite® AW 5306, HV 5309-1, RenPIM® 5219 A/B, 5217 B, DT082
RenShape® BM 5460	RenPaste® SV 427-2 / RenPaste® HY 5162	XW 5184, XW 5130	RenShape® BM 5266	Araldite® AW 106 / Araldite® HV 953U	RenPIM® 5219 AB, 5217 B, DT 078

Modeling pastes

Product designation	Colour	Mix Ratio	Pot Life	Density	Hardness	Coefficient of Thermal Expansion	HDT	Flexural Strength	Comments
		Conditions	RT / 1 000 ml					1.8 MPa	
		Norm		ISO 868	ISO 11359	ISO 75	ISO 178		
Unit		(pbw)	(min)	(g/cm ³)	(Shore D)	(10 ⁻⁶ K ⁻¹)	(°C)	(MPa)	
RenPaste® SV 36 / Ren® HV 36	Brown	100:100	60	0.5	55-60	40	55-60	18	Easily machinable formulation, very good adhesion
RenPaste® SV 427-2 / Ren® HV 427-1	Brown	100:100	40	0.6	50-55	65-70	55-60	20-25	Easily machinable formulation, very good adhesion

HDT : Heat Deflection Temperature

Stereolithography resins

Product designation	Colour	Viscosity	Hardness	Flex. Modulus	Ult. Tensile Strength	Elongation at Break	Notched Izod Impact	HDT	Comments
		Conditions						0.46 (1.8) MPa	
		Norm	28°C	ASTM D-2240	ASTM D-790	ASTM D-638	ASTM D-638	ASTM D-256	
Unit		(mPa.s)	(Shore D)	(MPa)	(MPa)	(%)	(J/m)	(°C)	

For use on SLA® 3500, SLA® 5000, SLA® 7000, Viper si2™ (solid state laser)

General purpose

RenShape® SL 5195	Clear amber	220	83	1 600	47	11	53	47 (43)	Highly accurate for master pattern (SLA® 5000 only)
RenShape® SL 5510	Clear amber	230	86	3 000	77	5	27	62 (53)	Highest accuracy (not suitable for SLA® 7000)
RenShape® SL 7510	Clear amber	400	87	2 400	44-57	10-14	32-37	51-58 (47-49)	Accurate multifunctional parts with high throughput (not suitable for SLA® 7000)
RenShape® SL 7520	Clear amber	570	86	2 800-2 900	62-65	5-7	15-18	54 (49)	High throughput, multifunctional parts (SLA® 7000 only)
RenShape® SL 7565	Clear Lt. amber	206	84	1 900-2 100	46-54	19-30	27-38	50 (118)	Clear ABS-like parts

Investment casting

RenShape® SL 7800	Clear amber	240	87	2 300-2 700	41-47	10-18	37-58	62 (-)	Highly accurate and dimensionally stable for Quickcast™ patterns
-------------------	-------------	-----	----	-------------	-------	-------	-------	--------	--

PP-like

RenShape® SL 7545	Clear amber	430	79	1 400-1 600	27-37	12-21	28-39	48-50 (43-48)	Durable PP-like parts
-------------------	-------------	-----	----	-------------	-------	-------	-------	---------------	-----------------------

White ABS-like

RenShape® SL 7580	White	580	84	2 400	53	11	34	63 (52)	Durable ABS-like parts
-------------------	-------	-----	----	-------	----	----	----	---------	------------------------

High heat resistance

RenShape® SL 5530	Clear amber	270	88	2 600-3 400	57-61	3-4	21	70-85 (55-58)	HDT reaches 250°C after thermal post cure
-------------------	-------------	-----	----	-------------	-------	-----	----	---------------	---

High clarity

RenShape® SL 7570	Clear	180	89	2 500-2 800	60	6-7	24-26	55 (122)	Clear, glass-like appearance parts
-------------------	-------	-----	----	-------------	----	-----	-------	----------	------------------------------------

For use on SLA® 250 (He-Cd laser)

RenShape® SL 5170	Clear amber	220	85	3 000	60	7-19	27-37	55 (49)	Highly accurate for master pattern
RenShape® SL 5240	Amber	350	84	1 500	37	22-26	43-53	58 (50)	PP-like parts suitable for «snap-fit»
RenShape® SL 5260	White	290	85	2 400	58	12	40	58 (51)	Durable ABS-like parts with fine features

Quickcast™ is a trademark of 3D Systems Corporation • RT : Room Temperature = 23±2°C • HDT : Heat Deflection Temperature

Ancillaries

Product designation	Description	Comments
Filler DT 077-1	White, soft mineral filler	Filler for various applications
Filler DT 078-1	Black, soft mineral filler	Filler for various applications
Filler DT 081	Grey, light mineral filler	Filler for various applications
Filler DT 082	White metalloxyd filler	Filler for various applications with high heat absorption
Filler DT 5039	Thixotropic agent	Lightweight filler for various applications
Accelerator DY 219	Accelerator for aromatic Epoxy hardeners and Polyurea systems	Accelerator for epoxy and polyurethane formulations
Freeman® Wax Sheets	Self adhesive wax sheets in different thicknesses	Spacing layers to simulate work piece thickness
RenLease® QZ 5101	Mould sealer, water soluble	For sealing of plastic, rubber, wax
RenLease® QV 5110	Mould release agent	Paste release agent for cold and warm curing systems
RenLease® QZ 5111	Mould release agent	Liquid release agent for cold and warm curing systems

Parts in minutes

Product designation	Colour	Mix Ratio	Pot Life	Demoulding Time	Max. Layer Thickness	Hardness	HDT	Tens. Strength	Flex. Modulus	Comments
Conditions			100 g				0.75 MPa			
Norm						ISO 868	ISO 75	ISO 527	ISO 178	
Unit		(pbw)	(s)	(min)	(mm)	(Shore D)	(°C)	(MPa)	(MPa)	
RenPIM® 5212 / 5212	Neutral	100:60	100-120 (RT)	15-20 (RT)	4	55-65	45	15-25	650	Flexible, simulates HDPE
RenPIM® 5213-1 / 5213-1	Caramel	100:65	50-70 (RT)	15-30 (RT)	3	78-83	90	35-40	1400	Flame retardant to UL 94 VO, simulates PP/ABS
RenPIM® 5214 / 5214	Beige	100:80	60-80 (RT)	10-15 (RT)	4	75-80	120	30-50	1775	High temperature resistance, pigmentable, simulates PP/ABS
RenPIM® 5215 / 5215	Black	100:80	40-60 (RT)	10-15 (RT)	4	75-80	130-140	30-40	1100	High temperature resistance, simulates PP/ABS
RenPIM® 5216 / 5216	Neutral	100:80	40-60 (RT)	15-20 (RT)	5	75-80	80	30-35	1200	Toughened high impact resistance, pigmentable, simulates PP/ABS
RenPIM® 5217 / 5217	Black	100:80	40-60 (RT)	10-15 (RT)	5	75-80	85-90	35-40	1250	Toughened high impact resistance, pigmentable, simulates PP/ABS
RenPIM® 5218 / 5218	Black	100:80	100-130 (RT)	20-30 (RT)	4	75-80	90-100	40-45	1900	High flexural modulus, toughened, simulates PP/ABS
RenPIM® 5219 / 5219	Neutral	100:80	40-60 min (RT)	16-18 hr (RT)	20	78-83	70-75	60-70	2800	For adding to faster systems to reduce reaction rate, for casting thicker layers
RenPIM® 5220 / 5220	Black	100:120	45-70 (RT)	15-20 (RT)	4	70-80	up to 184	45-50	1800	Temperature resistance to 180°C, simulates PP/ABS
RenPIM® 5221-1 / 5221-1	Black	32:100	45-55 (RT)	15-20 (RT)	4	70-74	58	30-40	350	High impact material for crash test parts, simulates PE (charpy impact 180 KJ/m²)

Vacuum grade

RenPIM® VG 5281 / 5281	Light amber	100:25	5-10 (40°C)	2 (70°C)	10	40A	N/A	0.75	-	Low tack, good resilience, pigmentable
RenPIM® VG 5281 / 5281	Light amber	100:30	5-10 (40°C)	2 (70°C)	10	50A	N/A	1.67	-	Low tack, good resilience, pigmentable
RenPIM® VG 5282 / 5281	Light amber	100:35	5-10 (40°C)	2 (70°C)	10	60A	N/A	2.62	-	Low tack, good resilience, pigmentable
RenPIM® VG 5282 / 5281	Light amber	100:40	5-10 (40°C)	2 (70°C)	10	70A	N/A	4.29	-	Low tack, good resilience, pigmentable
RenPIM® VG 5281 / 5283 / 5281	Light amber	60:40:45	5-10 (40°C)	2 (70°C)	10	80A	N/A	5.98	-	Low tack, good resilience, pigmentable
RenPIM® VG 5281 / 5283 / 5281	Light amber	40:60:45	5-10 (40°C)	2 (70°C)	10	90A	N/A	12.88	-	Low tack, good resilience, pigmentable
RenPIM® VG 5283 / 5281	White	100:70	5-10 (40°C)	2 (70°C)	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 (70°C)	10	68	97	25	660	High impact resistance, good temperature resistance
RenPIM® VG 5285 / 5285	Black	80:100	10 (RT)	0.75 (70°C)	10	80	120	42	1 400	High heat deflection, good flexibility
RenPIM® VG 5286 / 5286	Black	100:150	6 (40°C)	0.75 (70°C)	10	80	140	70	2 000	High heat resistance, ABS-like
RenPIM® VG 5287 / 5287	Clear transparent	100:150	4-5 (40°C)	2 (70°C)	10	80	116	76	2 400	Clear, transparent, UV stabilised, ABS-like
RenPIM® VG 5289 / 5289	Brown	100:90	5-6 (40°C)	2 (70°C)	10	78	84	64	107	Flame retardant grade, FAR 25 and UL 94 VO approved, ABS-like
RenPIM® VG 5234 / 5234	White	30:100	6 (40°C)	0.75 (70°C)	5	79	N/A	45	1 450	Pigmentable, PP/ABS like

RT : Room Temperature = 23±2°C • HDT : Heat Deflection Temperature

Seamless modeling pastes (machine applied)

Product designation	Colour	Mix Ratio	Min. Cure Schedule	Density	Hardness	Coef. of Thermal Expansion*	HDT	Compress. Strength*	Flexural Strength*	Comments
Conditions			RT				1.8 MPa			
Norm					ISO 868	ISO 11359	ISO 75	ISO 604	ISO 178	
Unit		(pbw)			(g/cm³)	(Shore D)	(10⁻⁶ K⁻¹)	(°C)	(MPa)	
XD 4601-1 / XD 4601-1	Light brown	100:100	Machinable in 1-2 days	0.52-0.57	40	106	45-50	8	6.5	Styling models up to 30 mm
RenPaste® SV 4503-1 / Ren® HV 4503-1	Brown	100:100	Machinable after 1 day	0.75-0.8	55-60	101	42	11.5	11	Master and data control in layer up to 40 mm
XD 4563-1 / HV 4503-1	Grey	100:100	Machinable after 1 day	0.75-0.8	55-60	101	42	11.5	11	Master and data control in layer up to 40 mm

* Properties after 3 days at room temperature • RT : Room Temperature = 23±2°C • HDT : Heat Deflection Temperature

Net size modeling

Product designation	Mix Ratio	Pot Life	Recommended Cure Schedule	Density	Hardness	Compress. Strength	Compress. Modulus	HDT	Comments
Conditions		RT / 3 kg						0.75 MPa	
Norm				ISO 868	ISO 604	ISO 604	ISO 604	ISO 75	
Unit	(pbw)	(min)	(°C)	(g/cm³)	(Shore D)	(MPa)	(MPa)	(°C)	
RenCast® 5146 A / RenCast® 5146 B	80:100	20-30	7 days @ RT or 14 hr @ 40	1.2	80	85-90	3000	75-80	Long pot life, low viscosity
RenCast® 5146 A / RenCast® 5146 B / DT 082	80:100:330	30-40	7 days @ RT or 14 hr @ 40	1.6	85	90-95	9500	75-80	Lower CTE, high compressive modulus

Product designation	Colour	Density	Hardness	Flexural Strength	Flexural Modulus	HDT	Comments
Norm			ISO 868	ISO 604	ISO 604	ISO 75	
Unit		(g/cm³)	(Shore D)	(MPa)	(MPa)	(°C)	
RenTool® 5148	Blue	1.8	85-90	80	9500	45	Good general properties
RenTool® 5149	Ivory	1.9	90-95	80	10500	40	High compressive modulus
RenTool® 5150	Brown	0.75-0.8	65-70	80	700-800	65-70	Good temperature performance
RenTool® 5152	Grey	1.9	90-95	115	13000	40	High flexural strength

RT : Room Temperature = 23±2°C • HDT : Heat Deflection Temperature

Gelcoats

Product designation	Colour	Mix Ratio	Pot Life	Demoulding Time	Density	Hardness	HDT	Comments
Conditions			RT / 250 ml				0.46 MPa	
Norm						ISO 868	ISO 75	
Unit		(pbw)	(min)	(hr)	(g/cm³)	(Shore D)	(°C)	
RenGel® SW 10 / Ren® HY 2404	White	100:10	20	12	1.5	85-90	60-70	Negatives, moulds and fixtures
RenGel® SW 10 / Ren® HY 5159	White	100:8	60	12	1.5	85-90	80	Negatives, moulds and fixtures
RenGel® SW 18 / Ren® HY 2404	Green	100:20	10-15	12	1.3	85-90	85	Wet lay-up tools, vacuum forming tools, RTM moulds
RenGel® SW 18 / Ren® HY 5159	Green	100:16	25	12	1.3	85-90	100	Wet lay-up tools, vacuum forming tools, RTM moulds
RenGel® SW 56 / Ren® HY 2404	Caramel	100:13	10-15	12	1.5	90	100	Foam and vacuum forming tools, pressure casting moulds (ceramics)
RenGel® SW 56 / Ren® HY 5159	Caramel	100:10	25-30	12	1.5	90	120	Foam and vacuum forming tools, pressure casting moulds (ceramics)
RenGel® SW 404 / Ren® HY 2404	Blue	100:10	15	12	1.8	85-90	80	Foundry patterns, copy-milling models
RenGel® SW 404 / Ren® HY 5159	Blue	100:8	50	12	1.8	85-90	100	Foundry patterns, copy-milling models
RenGel® SW 419-1 / Ren® HY 2419	Black	100:13	15-20	12	2.3	85-90	60-70	Sheet metal forming tools, foundry patterns
Coupling Coat P99 / Ren® HY 5159	Grey	100:11	30	12	1.5	90	120	Universally applicable on the tacky gelcoat
Resin XD 4628 / Hardener XD 4629	Clear	100:45	15	12	1.1	80	74	Clear, transparent, good UV stability

RT : Room Temperature = 23±2°C • HDT : Heat Deflection Temperature

Laminating systems for tooling applications

Product designation	Colour	Mix Ratio	Pot Life	Recommended Cure Schedule	HDT	Comments			
							Conditions	RT / 500 ml	1.8 MPa
							Norm		ISO 75
Unit	(pbw)	(min)	(°C)	(°C)					
RenLam® M-1 / Ren® HY 956	Pale yellow	100:20	30	7 days @ RT or 14 hr @ 40	50	Transparent, room temperature curing, good impregnation			
RenLam® LY 113 / Ren® HY 97-1	Clear to pale yellow	100:32	80	-	120	Low viscosity, long pot life, medium temperature performance			
RenLam® CY 219 / Ren® HY 5160	Pale yellow	100:50	80	7 days @ RT or 14 hr @ 40	45-50	Good properties with RT cure			
RenLam® CY 219 / Ren® HY 5161	Pale yellow	100:50	40	7 days @ RT or 14 hr @ 40	50-55	Good properties with RT cure			
RenLam® CY 219 / Ren® HY 5162	Pale yellow	100:50	20	7 days @ RT or 14 hr @ 40	55-60	Good properties with RT cure			
RenLam® LY 5210 / Ren® HY 5212	Amber	100:40	124	-	180-200	Long pot life with high temperature performance			
RenLam® LV 10 / Ren® HY 97 blue	Grey blue	100:20	60	14 hr gradually up to 120	125	Fibre reinforced paste, easy to handle			
Resin XD 4610 / Ren® HY 5158	Light yellow	100:19	45	14 hr gradually up to 120	120	Medium temperature performance			
Resin XD 4610 / Ren® HY 5159	Light yellow	100:19	40	14 hr gradually up to 120	120	Medium temperature performance			
Resin XD 4631 / XD 4629	Clear, transparent	100:45	20	14 hr gradually up to 120	70	Fast pot life, medium temperature performance			
Resin XD 4631 / XD 4630	Clear, transparent	100:40	100	14 hr gradually up to 120	105	Slow reactivity and good UV stability			

RT : Room Temperature = 23±2°C • HDT : Heat Deflection Temperature

Laminating systems for composite applications

Product designation	Mix Ratio	Pot Life	Gel Time	Recommended Cure Schedule	Tg	Flexural Strength	Ult. Flexural Elongation	Fracture properties* K _{1c} G _{1c}				
									Conditions	RT / 100 g	80°C	DSC, 10 K/min
									Norm			IEC 1006
Unit	(pbw)	(min)	(min)	(°C)	(°C)	(MPa)	(%)	(MPa√m) / (J/m²)				
Araldite® LY 5052 / Aradur® 5052	100:38	110-160	14-17	8 hr @ 80	114-122	116-122	8.5-13.4	0.77-0.83 192-212				
Araldite® LY 3297 / Aradur® 3298	100:40	120-135	18-26	8 hr @ 80	90-96	125-130	7.0-8.2	0.85-0.95 215-245				
Araldite® LY 3297 / Aradur® 3299	100:40	40-50	10-16	8 hr @ 80	94-100	123-128	9.0-12.0	0.80-0.90 195-225				
Araldite® LY 3505 / XB 3403	100:35	600-720	36-48	4 hr @ 60 + 6 hr @ 80	78-83	110-130	10.5-13.0	0.95-1.05 250-280				
Araldite® LY 3505 / XB 3404-1	100:35	80-100	11-18	4 hr @ 60 + 6 hr @ 80	76-81	125-145	6.9-9.5	0.80-0.95 160-200				
Araldite® LY 3505 / Aradur® 3405	100:35	26-36	5-11	4 hr @ 60 + 6 hr @ 80	87-92	135-155	7.0	0.80-0.90 150-190				

* Fracture properties (K_{1c}, G_{1c}) : CG Method PM 258-0/90 (Bend Notch Test) • K_{1c} (MPa√m) : Fracture toughness - G_{1c} (J/m²) : Fracture Energy

Prepreg systems

Product designation	Mix Ratio	B-Staging	Shelf Life	Recommended Cure Schedule	Tg	Comments			
							Conditions	RT	DSC, 10 K/min
							Norm		IEC 1006
Unit	(pbw)			(°C)	(°C)				
Resin XB 3515 / Aradur® 5021	100:24	Physical B-Stage	> 40 days	1hr @ 120 + 2 hr @ 140	140-146	B-staging on line			
Resin XB 3540 / Aradur® 5021	100:18	Physical B-Stage Drying condition 10 min @ 90°C	> 1 month	30 min @ 140	114-124	Solvent based prepreg			
Araldite® LY 556 / Aradur® 5021 / XB 3403	100:25:12	Chemical B-Stage 24 hr @ RT	> 6 weeks	90 min @ 120	115-125	Easy B-staging			
Araldite® LY 556 / Aradur® 5021 / XB 3471	100:25:14	Chemical B-Stage 3 min @ 80-90°C	> 3 weeks	90 min @ 120	115-125	Sharp B-staging			

RT : Room Temperature = 23±2°C

Prepreg systems (following)

Product designation	Mix Ratio	B-Staging	Shelf Life	Recommended Cure Schedule	Tg	Comments			
							Conditions	RT	DSC, 10 K/min
							Norm		IEC 1006
Unit	(pbw)			(°C)	(°C)				
Resin XU 3508 / Aradur® 5021 / XB 3403	100:22:12	Chemical B-Stage 24 hr @ RT	> 6 weeks	90 min @ 120	110-120	Toughened prepreg with easy B-staging			
Resin XU 3508 / Aradur® 5021 / XB 3403	100: 22:12	Chemical B-Stage 24 hr @ RT	> 6 weeks	90 min @ 120	110-120	Toughened prepreg with easy B-staging			
Araldite® LY 5150 / Aradur® 5021 / XB 3471	100:12:4	Chemical B-Stage 3 min @ 80-90°C	6-8 weeks	1 hr 30 @ 130	135-145	High Tg prepreg			

RT : Room Temperature = 23±2°C

Casting systems

Product designation	Colour	Mix Ratio	Pot Life	Viscosity	Layer Thickness	Compres. Strength	Flex. Strength	HDT	Demoulding Time	Comments			
											Conditions	RT / 1000 ml	1.8 MPa
											Norm		ISO 75
Unit	(pbw)	(min)	(mPa.s)	(mm)	(MPa)	(MPa)	(°C)	(hr)					
RenCast® CW 20 / Ren® HY 49	Blue	100:5	110	15 000	< 30	135-145	105-115	65-70	7 days @ RT or 14 hr @ 60°C	General purpose, high compression strength			
RenCast® CW 47 / Ren® HY 33	Grey	100:15	240	17 000	< 100	150-160	115-125	200-210	3-4 days @ RT or 14 hr @ 60°C	High temp. performance, high compression strength			
RenCast® CW 5156-1 / Ren® HY 5158	Grey	100:8	80	20 000	< 80	140-145	70-80	120-130	24	Low viscosity, high chemical resistance, medium temp. performance			
RenCast® CW 2215 / Ren® HY 5160	Yellow	100:20	120	4 000	< 80	80-90	65-75	50-55	16	Mineral filled, low density			
RenCast® CW 2215 / Ren® HY 5161	Yellow	100:20	45	5 000	< 20	80-90	60-70	55-60	12	Mineral filled, low density			
RenCast® CW 2215 / Ren® HY 5162	Yellow	100:20	25	5 000	< 10	80-90	60-70	60-65	10	Mineral filled, low density			
RenCast® CW 2418-1 / Ren® HY 5160	Black	100:15	120	4 000	< 80	80-90	80-90	50-55	16	Good abrasion resistance			
RenCast® CW 2418-1 / Ren® HY 5161	Black	100:15	60	5 000	< 20	80-90	80-85	55-60	12	Good abrasion resistance			
RenCast® CW 2418-1 / Ren® HY 5162	Black	100:15	30	5 000	< 10	80-90	80-85	60-65	10	Good abrasion resistance			
RenCast® CW 2418-1 / Ren® HY 5118	Black	100:20	80	15 000	< 40	80-90	80-85	60-65	16	Good abrasion resistance			

Recommended cure schedule : 7 days at RT or see data sheet • RT : Room Temperature = 23±2°C

Fastcast polyurethanes

Product designation	Colour	Mix Ratio	Pot Life	Density	Compres. Strength	Compres. Modulus	HDT	Flex. Strength	Comments			
										Conditions	RT / 1 kg	0.75 MPa
										Norm		ISO 75
Unit	(pbw)	(min)	(g/cm³)	(MPa)	(MPa)	(°C)	(MPa)					
RenCast® FC 50 / FC 50	Off White	100:20	4-5	1.6	75	3500	95	45-50	Filled, machinable, polishable			
RenCast® FC 51 / FC 51	Grey	100:100	4-5	1.6	65	3000	80	31	1:1 system for thick casting			
RenCast® FC 52 / FC 52	Beige unfilled	100:100	6-8	1.0	35	1000	80	25	Low viscosity, pigmentable			
RenCast® FC 52 / FC 52 / DT 082	Beige	100:100:300	10	1.6-1.7	45-50	2500	85-90	26	Variable filler content for large casting			
RenCast® FC 53 / FC 53	Beige unfilled	100:100	3-4	1.1	41	1150	85	41	Low viscosity, fast demould			
RenCast® FC 53 / FC 53 / DT 082	Beige	100:100:300	5-6	1.6-1.7	45-50	2500	85-90	34	Variable filler content for large casting			
RenCast® FC 54 / FC 54	Blue	100:100	8	1.6	65-70	3000	85-90	45	1:1 slower system for thick casting			

Recommended cure schedule : 7 days at RT • RT : Room Temperature = 23±2°C