

## Huntsman Advanced Materials

We are a leading global supplier of synthetic and formulated polymer systems for customers requiring high-performance materials which outperform the properties, functionality and durability of traditional materials. Over 2300 associates at 13 locations worldwide work to fulfill this promise day by day.

More than 9000 companies around the world use Huntsman Advanced Materials technologies in key markets such as adhesives and inks, aerospace, automotive, coatings, construction, electronics, medical, marine, power transmission and distribution, sports equipment and wind power generation.

## Composites Market

With recognized expertise in research, development and processes we offer a unique and wide range of innovative high-value thermosets, combined with strong technical support to the industries using fiber reinforcement technologies. Our solutions open new possibilities in design and systems integration with high strength-to-weight and stiffness-to-weight ratios as well as superior mechanical and thermal performance.

## Global presence – 13 manufacturing sites



# HUNTSMAN

Enriching lives through innovation

### For more information

[www.huntsman.com/advanced\\_materials](http://www.huntsman.com/advanced_materials)  
[advanced\\_materials@huntsman.com](mailto:advanced_materials@huntsman.com)

**Europe/Africa:**  
Huntsman Advanced Materials (Switzerland) GmbH  
Klybeckstrasse 200  
P.O. Box  
4002 Basel  
Switzerland  
Tel. +41 61 299 11 11  
Fax +41 61 299 11 12

**India/Middle East:**  
Huntsman Advanced Materials (India) Pvt. Ltd.  
5th Floor, Bldg. No. 10  
Solitaire Corporate Park, 167  
Guru Hargovindji Marg, Chakal, Andheri (East)  
Mumbai – 400 093  
India  
Tel. +91 22 4095 1556 -60  
Fax +91 22 4095 1300/1400/1500

**Asia/Pacific:**  
Huntsman Advanced Materials (Guangdong) Co., Ltd.  
Rooms 4604 – 4608, Maxdo Center  
8 Xing Yi Road  
Shanghai, 200336  
P.R. China  
Tel. +86 21 2208 7588  
Fax +86 21 2208 7511

**Americas:**  
Huntsman Advanced Materials Americas Inc.  
10003 Woodloch Forest Drive  
The Woodlands  
Texas 77380  
USA  
Tel. +1 888 564 9318  
Fax +1 281 719 4047

### Legal information

All trademarks mentioned are either property of or licensed to Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.

Sales of the product described herein ("Product") are subject to the general terms and conditions of sale of either Huntsman Advanced Materials LLC, or its appropriate affiliate including without limitation Huntsman Advanced Materials (Europe) BVBA, Huntsman Advanced Materials Americas Inc., or Huntsman Advanced Materials (Hong Kong) Ltd. or Huntsman Advanced Materials (Guangdong) Ltd. ("Huntsman"). The following supercedes Buyer's documents. While the information and recommendations included in this publication are, to the best of Huntsman's knowledge, accurate as of the date of publication, NOTHING CONTAINED HEREIN IS TO BE CONSTRUED AS A REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHTS, OR WARRANTIES AS TO QUALITY OR CORRESPONDENCE WITH PRIOR DESCRIPTION OR SAMPLE, AND THE BUYER ASSUMES ALL RISK AND LIABILITY WHATSOEVER RESULTING FROM THE USE OF SUCH PRODUCT, WHETHER USED SINGLY OR IN COMBINATION WITH OTHER SUBSTANCES. No statements or recommendations made herein are to be construed as a representation about the suitability of any Product for the particular application of Buyer or user or as an inducement to infringe any patent or other intellectual property right. Data and results are based on controlled conditions and/or lab work. Buyer is responsible to determine the applicability of such information and recommendations and the suitability of any Product for its own particular purpose, and to ensure that its intended use of the Product does not infringe any intellectual property rights.

The Product may be or become hazardous. Buyer should (i) obtain Material Safety Data Sheets and Technical Data Sheets from Huntsman containing detailed information on Product hazards and toxicity, together with proper shipping, handling and storage procedures for the Product, (ii) take all steps necessary to adequately inform, warn and familiarize its employees, agents, direct and indirect customers and contractors who may handle or be exposed to the Product of all hazards pertaining to and proper procedures for safe handling, use, storage, transportation and disposal of and exposure to the Product and (iii) comply with and ensure that its employees, agents, direct and indirect customers and contractors who may handle or be exposed to the Product comply with all safety information contained in the applicable Material Safety Data Sheets, Technical Data Sheets or other instructions provided by Huntsman and all applicable laws, regulations and standards relating to the handling, use, storage, distribution and disposal of and exposure to the Product. Please note that products may differ from country to country. If you have any queries, kindly contact your local Huntsman representative.

© 2010 Huntsman Corporation. All rights reserved.  
Ref. No. AdMat Composites 03.10\_EN\_EU

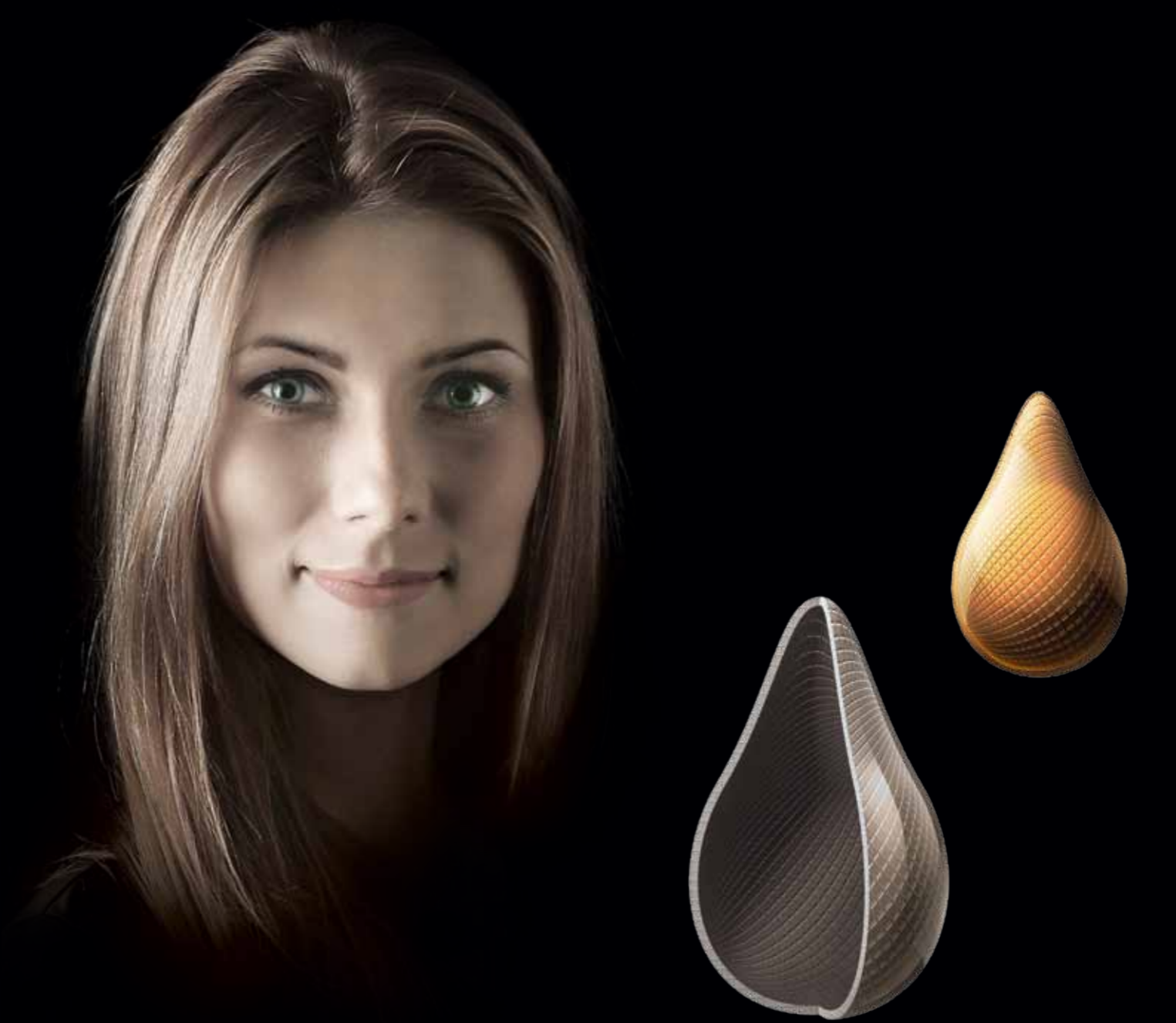
# HUNTSMAN

Enriching lives through innovation

## Advanced Materials

## Light on weight – heavy on strength

## Composite resin systems Selector guide



**Composite resin systems for wet lay-up, RTM, infusion, filament winding and pultrusion processes**

	Wet lay-up	RTM	Infusion	Filament winding	Pultrusion	Pot life	Gel time	Mix viscosity		Applied cure schedule	T <sub>g</sub>	Flexural strength	Ultimate flexural elongation	Fracture toughness K <sub>IC</sub>	Fracture energy G <sub>IC</sub>
Conditions						RT, 100ml	80 °C	25 °C			DSC, 10 K/min				
Norm											IEC 1006	ISO 178			
Unit						min	min	mPa·s			°C	MPa	%	MPa√m	J/m <sup>2</sup>
<b>RenLam® CY 219/ Ren® HY 5160</b>	●●●					80	N/A	900 – 1000		14 h at 40 °C	45 – 50 (ISO 75, deflection temperature)	90 – 95	N/A	N/A	N/A
<b>RenLam® CY 219/ Ren® HY 5161</b>	●●●					40	N/A	1000 – 1200		14 h at 40 °C	50 – 55 (ISO 75, deflection temperature)	95 – 100	N/A	N/A	N/A
<b>RenLam® CY 219/ Ren® HY 5162</b>	●●●					20	N/A	1000 – 1100		14 h at 40 °C	55 – 60 (ISO 75, deflection temperature)	95 – 100	N/A	N/A	N/A
<b>Resin XU 3508/ Hardener XB 3403</b>	●●●	●●				600 – 720	30 – 36	650 – 800		4 h at 60 °C + 6 h at 80 °C	70 – 75	100 – 125	9 – 11	2.1 – 2.3	1250 – 1400
<b>Araldite® LY 3505/ Hardener XB 3404-1*</b>	●●●					80 – 100	11 – 18	550 – 800		4 h at 60 °C + 6 h at 80 °C	76 – 81	125 – 145	6.5 – 9.5	0.8 – 0.95	160 – 200
<b>Araldite® LY 3505/ Hardener XB 3403*</b>	●●●					600 – 720	36 – 48	300 – 400		4 h at 60 °C + 6 h at 80 °C	78 – 83	110 – 130	10.5 – 13	0.95 – 1.05	250 – 280
<b>Araldite® LY 3505/ Aradur® 3405*</b>	●●●					26 – 36	5 – 11	1000 – 1200		4 h at 60 °C + 6 h at 80 °C	87 – 92	135 – 155	7 – 9	0.8 – 0.9	150 – 190
<b>Araldite® LY 1564/ Aradur® 3486*</b>	●●	●●	●●	●●	●●	560 – 620	33 – 43	200 – 300		8 h at 80 °C	80 – 84	118 – 130	10.5 – 12.5	0.95 – 1.05	260 – 310
<b>Araldite® LY 1564/ Aradur® 3487*</b>	●●	●●	●●●			130 – 160	18 – 25	220 – 320		8 h at 80 °C	81 – 86	118 – 130	10 – 12	0.95 – 1.05	255 – 305
<b>Araldite® LY 3598/ Aradur® 3498</b>	●●	●●●				40 – 70	7 – 10	400 – 900		30 min at 100 °C	87 – 93	100 – 110	7 – 8.5	1.7 – 1.9	900 – 1100
<b>Araldite® LY 5085/ Aradur® 5046 U</b>	●●●					150 – 180	9 – 13	1200 – 1500		10 min at 80 °C + 20 min at 100 °C	95	100 – 120	9 – 12	N/A	N/A
<b>Araldite® LY 3297/ Aradur® 3298</b>	●●●	●●●	●●			120 – 135	18 – 26	320 – 380		8 h at 80 °C	92 – 98	125 – 130	7 – 8	0.85 – 0.95	215 – 245
<b>Araldite® LY 3297/ Aradur® 3299</b>	●●	●●●	●●			40 – 50	10 – 16	350 – 400		8 h at 80 °C	94 – 100	123 – 128	9 – 12	0.8 – 0.9	195 – 225
<b>Resin XU 3508/ Aradur® 3486</b>	●●●	●●●	●●	●●	●●	380 – 480	9 – 14 at 100 °C	720 – 860		5 h at 100 °C	95 – 102	110 – 125	10 – 12.5	2.2 – 2.4	1500 – 1700
<b>Araldite® LY 564/ Hardener XB 3458</b>		●●●				13 – 17	2 – 4	220 – 320 at 40 °C		10 min at 80 °C + 20 min at 100 °C	92 – 102	125 – 140	6.5 – 9	1.2 – 1.5	420 – 520
<b>Resin XU 3508/ Hardener XB 3458</b>		●●●				14 – 18	2 – 4	700 – 850 at 40 °C		10 min at 80 °C + 20 min at 100 °C	100 – 110	115 – 125	4 – 7	1.20 – 1.35	380 – 500
<b>Resin XB 3585/ Hardener XB 3458</b>		●●●				14 – 18	2 – 4	450 – 550 at 40 °C		10 min at 80 °C + 20 min at 100 °C	100 – 110	120 – 140	5 – 7	1.05 – 1.2	280 – 325
<b>Araldite® LY 564/ Aradur® 5003-1</b>	●●	●●●				42 – 52	6 – 8	200 – 260 at 40 °C		30 min at 80 °C + 2 h at 120 °C	108 – 115	108 – 118	7 – 9	0.9 – 1	230 – 290
<b>Continued on page 4</b>															

\* Germanische Lloyd (GL) test approved

- Highly recommended
- Recommended

Composite resin systems for wet lay-up, RTM, infusion, filament winding and pultrusion processes

Continued

	Wet lay-up	RTM	Infusion	Filament winding	Pultrusion	Pot life	Gel time	Mix viscosity		Applied cure schedule	T <sub>g</sub>	Flexural strength	Ultimate flexural elongation	Fracture toughness K <sub>1c</sub>	Fracture energy G <sub>1c</sub>
Conditions						RT, 100ml	80°C	25°C			DSC, 10 K/min				
Norm											IEC 1006	ISO 178			
Unit						min	min	mPa·s			°C	MPa	%	MPa√m	J/m <sup>2</sup>
<b>Araldite® LY 5052/ Aradur® 5052</b>	●●●	●●	●●			110 – 160	14 – 17	500 – 700		8h at 80°C	114 – 122	116 – 122	8.5 – 13.4	0.77 – 0.83	192 – 212
<b>Resin XB 3585/ Aradur® 5003-1</b>	●●●	●●				40 – 48	6 – 8	440 – 500 at 40°C		30min at 80°C + 2h at 120°C	120 – 130	115 – 125	6 – 9	0.8 – 0.9	180 – 230
<b>Araldite® LY 564/ Aradur® 917/ Accelerator 960-1</b>			●●	●●●	●●●	4800 – 5400	30 – 40	450 – 700		4h at 80°C + 4h at 120°C	122 – 130	140 – 150	6 – 7	0.59 – 0.7	100 – 125
<b>Araldite® LY 564/ Aradur® 22962</b>	●●	●●●	●●●			110 – 150	20 – 30	400 – 600		15min at 120°C + 2h at 150°C	130 – 140	124 – 132	9 – 11	0.8 – 0.95	200 – 260
<b>Araldite® LY 564/ Aradur® 2954</b>	●●	●●●	●●	●●	●●	480 – 600	35 – 45	500 – 700		1h at 80°C + 8h at 140°C	143 – 148	120 – 124	6.5 – 7.5	0.69 – 0.76	149 – 181
<b>Resin XU 3508/ Aradur® 22962</b>	●●	●●●				90 – 150	24 – 40	1800 – 2100		1h at 80°C + 2h at 150°C	144 – 154	120 – 135	8 – 10	0.95 – 1.15	340 – 380
<b>Araldite® LY 556/ Aradur® 917/ Accelerator DY 070</b>			●●	●●●	●●●	5700 – 6300	140 – 160	600 – 900		4h at 80°C + 8h at 140°C	148 – 153	125 – 135	6 – 8.5	0.56 – 0.6	88 – 96
<b>Araldite® LY 556/ Aradur® 22962</b>	●●●	●●				120 – 180	18 – 22	1800 – 2000		15min at 120°C + 2h at 150°C	148 – 158	130 – 136	7.5 – 10	0.68 – 0.78	140 – 175
<b>Resin XU 3508/ Aradur® 2954</b>	●●	●●●	●●			320 – 380	9 – 14 at 100°C	2600 – 3300		1h at 80°C + 8h at 160°C	150 – 158	125 – 135	7 – 8	0.85 – 1.05	250 – 290
<b>Araldite® MY 740/ Aradur® HY 906/ Accelerator DY 070</b>			●●	●●●	●●●	> 600	100	ca. 1100		30min at 110°C + 30min at 170°C + 30min at 200°C	165 – 175	140 – 150	5.5 – 6.5	0.5 – 0.7	70 – 100
<b>Araldite® LY 556/ Hardener XB 3473</b>		●●	●●	●●	●●	1920 – 2220	> 600	5200 – 6000		2h at 120°C + 4h at 180°C	185 – 194	110 – 120	5.5 – 6.5	0.7 – 0.85	190 – 220
<b>Araldite® CY 179/ Aradur® 917/ Accelerator DY 070</b>			●●	●●	●●	> 2880	60 – 80	100 – 200		1h at 100°C + 6h at 180°C	200 – 205	75 – 95	2 – 3.5	0.46 – 0.5	65 – 75
<b>Resin XB 9721/ Aradur® 917/ Accelerator DY 070</b>				●●	●●●	110 – 130	6 – 9 at 120°C	550 – 750		2h at 120°C + 2h at 160°C + 2h at 200°C + 4h at 220°C	205 – 215	85 – 100	2.5 – 3	0.43 – 0.5	45 – 60
<b>Araldite® LY 8615/ Aradur® 8615</b>	●●	●●	●●●	●●	●●	1080	ca. 35	ca. 550		90min at 80°C + 1h at 150°C + 3h at 180°C	ca. 220	ca. 100	ca. 4	ca. 0.65	ca. 140
<b>Resin XB 9721/ Hardener XB 3473</b>		●●		●●●	●●	4800 – 5700	80 – 100 at 120°C	14000 – 17000		2h at 120°C + 2h at 160°C + 2h at 200°C + 4h at 220°C	232 – 238	105 – 125	3 – 4.2	0.61 – 0.67	95 – 100

●●● Highly recommended  
●● Recommended

## Composite resin systems for prepreg processes

	Mix viscosity	B-staging	Shelf life	Gel time**	Applied cure schedule		T <sub>g</sub>	Flexural strength	Ultimate flexural elongation	Fracture toughness K <sub>1c</sub>	Fracture energy G <sub>1c</sub>	Comments	Markets
Conditions	25 °C		RT	120 °C			DSC, 10 K/min						
Norm							IEC 1006	ISO 178					
Unit	mPa·s			min			°C	MPa	%	MPa√m	J/m <sup>2</sup>		
<b>Araldite® LZ 5021 / Aradur® 1571 / Accelerator 1573</b>	550 – 850	6 – 10 min at 90 °C (drying)	9 – 12 months	8 – 15	25 min at 125 °C		85 – 117	118 – 120	13 – 16			solvent	wind, sport and marine
<b>Araldite® LY 1556 / Aradur® 1571 / Accelerator 1573 / Hardener XB 3403*</b>	4 000 – 6 000	24 – 48 h at 23 °C	> 6 weeks	6 – 11	2 h at 120 °C		105 – 115	125 – 140	7 – 10	0.7 – 0.85	130 – 250	chemical B-stage	wind, sport and marine
<b>Araldite® LY 1556 / Aradur® 1571 / Accelerator 1573 / Hardener XB 3471</b>	5 000 – 5 900	2 – 3 min at 80 – 90 °C	> 6 weeks	5 – 12	2 h at 120 °C		118 – 126	125 – 145	5.5 – 8.5	0.7 – 0.9	210 – 390	chemical B-stage	wind, sport and marine
<b>Araldite® LY 3593 / Aradur® 1571 / Accelerator 1573</b>	3 000 – 8 000		> 5 weeks	7 – 11	30 min at 150 °C		115 – 120	120 – 130	6 – 8	1.8 – 2	1 000 – 1 200	hot-melt	general industry
<b>Resin XU 3508 / Aradur® 1571 / Accelerator 1573 / Hardener XB 3403*</b>	6 650 – 7 450	24 h at 23 °C	> 1 month	4 – 12	4 h at 120 °C		116 – 125	110 – 120	5.5 – 8	1.43 – 1.65	850 – 1 000	chemical B-stage	wind, sport and marine
<b>Resin XU 3508 / Aradur® 1571 / Accelerator 1573 / Hardener XB 3471</b>	5 900 – 6 200	3 – 6 min at 90 °C	> 1 month	4 – 8	4 h at 120 °C		122 – 137	110 – 133	6 – 10	1.15 – 1.48	500 – 800	chemical B-stage	wind, sport and marine
<b>Resin XB 3515 / Aradur® 1571 / Accelerator 1573</b>	30 – 40 at 75 °C		> 6 weeks	6 – 13	1 h at 120 °C + 2 h at 140 °C		130 – 150	110 – 140	5 – 8	1.1 – 1.3	350 – 480	hot-melt	wind, sport and marine
<b>Araldite® LY 5150 / Aradur® 1571 / Accelerator 1573 / Hardener XB 3471</b>	3 500 – 4 500 at 50 °C	1 – 3 min at 80 – 90 °C	> 8 weeks	10 – 28	1 h at 140 °C		140 – 155	130 – 160	4 – 8	0.6 – 0.75	100 – 140	chemical B-stage	wind, sport and marine

\* Germanische Lloyd (GL) test approved

\*\*Adjustable reactivity with accelerator level ratio (accelerator 1573)