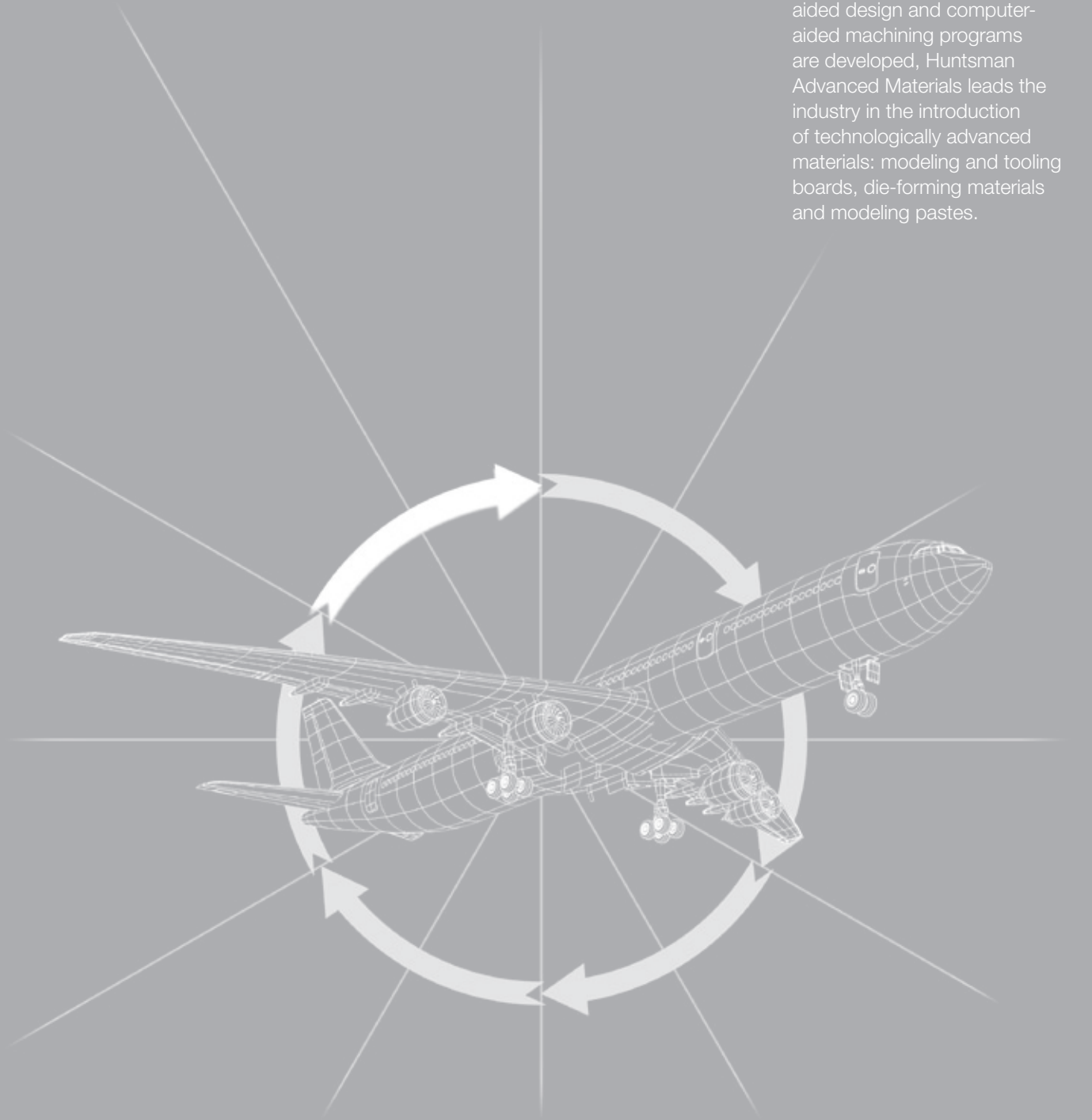


AEROSPACE Design and Prototype SELECTOR GUIDE

As sophisticated computer-aided design and computer-aided machining programs are developed, Huntsman Advanced Materials leads the industry in the introduction of technologically advanced materials: modeling and tooling boards, die-forming materials and modeling pastes.



HUNTSMAN

Modeling and styling boards

Product Designation	Colour	Density (g/cm ³)	Hardness Shore D ISO 868	Compressive Strength ISO 604 (MPa)	Compressive Modulus ISO 604 (MPa)	Coefficient of Thermal Expansion ISO 11359 (10 ⁻⁶ K ⁻¹)*	Deflection Temp. ISO 75 (°C)
RenShape® BM 5025	Apricot	0.24	-	3-4	140	60-70	60
RenShape® BM 5030	Siena	0.3	-	6-8	250-300	60-65	60-70
RenShape® BM 5108	White	0.08	-	-	-	-	-
RenShape® BM 5185	Apricot or brown	0.47	-	10-15	500-600	60-65	60-70
RenShape® BM 5440	Brown	0.5	55-60	15-20	600-700	50-55	75-80
RenShape® BM 5460	Brown	0.7	60-65	20-25	910-960	50-55	75-80

* -30°C to +45°C

Tooling boards

Product Designation	Colour	Density (g/cm ³)	Hardness Shore D ISO 868	Barcol-Hardness	Compressive Strength ISO 604 (MPa)	Compressive Modulus ISO 604 (MPa)	Coefficient of Thermal Expansion ISO 11359 (10 ⁻⁶ K ⁻¹)*	Deflection Temp. ISO 75 (°C)
RenShape® BM 5055	Green	0.72-0.75	75	-	50-55	2 300-2 400	35-45	135-140
RenShape® BM 5112	Grey	1.5	80-85	-	50-60	2 400-2 800	95-105	85-90
RenShape® BM 5166	Ivory	1.7	85-90	30-35	90-100	7 000-7 500	45-50	75-80
RenShape® BM 5172	Green	1.2	80	-	60-70	1 900-2 000	80-85	80-90
RenShape® BM 5266	Dark grey	1.7	85-90	40-45	125-130	7 000-7 500	45-50	120-125
RenShape® BM 5272	Olive	1.4	80-85	10-15	70-80	3 300-3 500	65-70	80-90
RenShape® BM 5273	Red	1.5	80-85	-	50-60	2 400-2 800	80-90	85-90
RenShape® RS 470	Grey / Brown	1.6-1.7	85-90	35-40	95-100	7 000-7 500	40-45	85-90

* -30°C to +45°C

Seamless modeling pastes and patty

Product Designation	Mix Ratio (pbw)	Mix. Viscosity at 25°C (mPas)	Pot Life at 25°C (min)	Density (g/cm ³)	Hardness Shore D	Compr. Strength at 25 °C ASTM D-695 (MPa)	Flex. Strength at 25 °C ASTM D-790 (MPa)	Tg by DMA - E' ASTM D-790 (°C)	Linear Shrinkage (mm/m)	Coef. of Thermal Expansion ASTM D-386 (10 ⁻⁶ K ⁻¹)**
RenPaste® 4503 R/H	100:90	Paste	60-90 (3.8 cm)	0.8	60	14.5	15.2	58	2	58
XD 4616 R/H	100:100	Paste	15 (1 kg)	1.25-1.3	75-80	58 ¹⁾	37 ¹⁾	85 ²⁾	0.5	80-85 ³⁾
RP 4040	One-component	Clay-like patty	Heat cure material	1.6	88	141	56	162*	-	18***

* E' peak • ** 18°C to 30°C • *** 0°C to 104° • 1) ISO 604 • 2) TMA • 3) ISO 11359

Infusion systems

Product Designation	Colour	Mix Ratio (pbw)	Mix. Viscosity at 23°C (mPas)	Gel Time* ASTM D-2471 (min)	Hardness Shore D	Ult. Flexural Strength ASTM D-790 (MPa)	Flexural Modulus ASTM D-790 (GPa)	Ult. Tensile Strength ASTM D-638 (MPa)	Elong. ASTM D-638 (%)	Glass Transition Temp E' - DMA ASTM D-4065 (°C)
RenInfusion® 8601 / Ren® 8601	Transp.	100:25	175	132	82	55.2	1.7	37.9	30.0	66****
RenInfusion® 8601 / Ren® 8602	Transp.	100:25	175	70	82	75.9	2.2	54.5	6.0	73****
RenInfusion® 8603 / Ren® 8603	Semi-opaque Off-white	100:15	240	78	82	97.9	2.7	58.6	2.6	74
RenInfusion® 8604 / Ren® 8604	Transp.	100:15	370	120	81	78.6	2.8	52.4	2.0	73
RenInfusion® 8605 / Ren® 8605	Transp.	100:35	700	480 580***	89	84.1	2.6	47.6	2.5	153
RenInfusion® 8606 / Ren® 8606	Transp.	100:35	1 800	670***	87	103.4	2.7	64.1	3.9	173
RenInfusion® 8610 (One component)	Transp.	N/A	10 000	N/A	89	86.9	2.9	34.5	2.0	155****
RenInfusion® 8612 (One component)	Transp.	N/A	5 000	N/A	88	97.2	2.9	66.2	5.0	95
RenInfusion® 8615 / Ren® 8615	Transp.	100:50	550	20 hrs***	87	69.0	2.9	-	-	217

Tests were conducted on neat systems. See Technical Data Sheet for recommended cure schedule.

* 400 cm³ • ** 25°C • *** 120 cm³ • **** E" peak

High-temperature laminating also suitable for infusion

Product Designation	Hardener	Colour	Mix Ratio (pbw)	Pot Life 500 ml (min)	Deflection Temp. ISO 75 (°C)	Curing (°C)	Characteristics
RenLam® M1	HY 956	Light yellow	100:20	20	50	14 hrs @ 40°C	Low cost basic system.
RenLam® CY 219	HY 5160	Light yellow	100:50	80	45-50	14 hrs @ 40°C	Standard system with different speed hardeners.
	HY 5161		100:50	40	50-55		
	HY 5162		100:50	20	50-55		
RenLam® LY 90	HY 956	White	100:16	30	60	14 hrs @ 40°C	White version of above.
XD 4631	XD 4629	Clear	100:45	20	70	14 hrs up to 120°C	UV resistant, polishable.
	XD 4630	Clear	100:40	100	100		
RenLam® LY 113	HY 97-1	Light yellow	100:30	80	120	14 hrs up to 120°C	Medium heat resistance, low viscosity and good wetting of fibres.
	HY 98		100:30	190	120		
XD 4610	HY 5158	Light yellow	100:19	45	120	14 hrs up to 120°C	As LY 113, but with flow control to minimise draining.
	HY 5159		100:19	40	120		
RenLam® LY 5210	HY 5158	Amber	100:25	150	160-170	14 hrs up to 160°C	Intermediate heat system for medium/large applications.
RenLam® LY 5210	HY 5210	Amber	100:40	48 hr	210	Special cure cycle at 200°C	Very long open time, good wetting and high heat resistance.
	HY 5211			24 hr	190		
	HY 5212			12 hr	223		
	HY 5213			-	-		
RenLam® LY 560	HY 560	Light yellow	100:25	35	65-70	14 hrs @ 40°C	High strength, good impregnation and good cure in thin layers.

High temperature surface coats (Gelcoats)

Product Designation	Hardener	Colour	Mix Ratio (pbw)	Pot Life 250 ml (min)	Deflection Temp. ISO 75 (°C)	Curing (°C)	Characteristics
RenGel® SW 10	HY 2404	White	100:10	20	60-70	RT	General purpose, sandable.
	HY 5159		100:8	60	80		
RenGel® SW 404	HY 2404	Blue	100:10	15	80	RT	Hard, giving high abrasion resistance.
	HY 5159		100:8	50	100		
RenGel® SW 419	HY 2419	Black	100:13	15-20	60-70	RT	Iron filled, giving a medium hard, low friction surface.
RenGel® SW 18	HY 2404	Green	100:20	10-15	85	RT + med. heat	Polishable, and very easy application.
	HY 5159		100:16	25	100		
XD 4629	XD 4629	Clear	100:45	20	70	RT + med. heat	UV resistant, polishable.
	XD 4630		100:40	100	100		
RenGel® SW 56	HY 2404	Caramel	100:13	10-15	100	RT + med. heat	Styrene resistant, viscous and not polishable.
	HY 5159		100:10	25-30	150		
XD 4615	HY 5159	Black	100:17	25-30	120	RT + med. heat	Polishable with easy application.
XD 4623	HY 5159	Green	100:17	25-30	120	RT + med. heat	Polishable with extra easy application.
RenGel® SW 5200	HY 5158	Black	100:12.5	120	160-170	RT + heat	Intermediate open time and heat resistance.
RenGel® SW 5200	HY 5210	Black	100:20	96 hr	190	40 to 60 + heat stepwise	Very long open time, easy application, high heat resistant.
	HY 5211			18 hr	200		
	HY 5212			10 hr	200		
	HY 5213			-	-		

Stereolithography resins – Solid state

Product Designation	Colour	Viscosity at 28°C (mPas)	Hardness Shore D ASTM D-2240	Flexural Modulus ASTM D-790 (GPa)	Flexural Strength ASTM D-790 (MPa)	Tensile Strength ASTM D-638 (MPa)	Elongation ASTM D-638 (%)	Notched Izod Impact ASTM D-256 J/m	Heat Deflection Temp. at 0.46 MPa (1.8 MPa) ASTM D-648 (°C)
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General Purpose

RenShape® SL 5195	Clear amber	220	83	1.6	49.3	46.5	11	53.3	47 (43)
RenShape® SL 5510	Clear amber	230	86	3.1	99.3	76.6	5.4	26.7	62 (53)
RenShape® SL 7510	Clear amber	400	87	2.5	82.1	44.8	13.7	32.0	51 (47)
RenShape® SL 7520	Clear amber	570	86	2.8-2.9	97.2-103.4	62.1-64.8	5.2-7.2	15.5-18.1	54 (49)
RenShape® SL 7565	Clear Lt. amber	206	84	1.9-2.1	59.3-65.5	45.5-53.8	19-30	26.7-37.3	50 (-)
RenShape® SL 7570	Clear	180	89	2.5-2.8	95.2-97.9	59.3-60.0	6-7	24.0-26.1	55 (-)

Durable

RenShape® SL 7540	Clear amber	360	79	1.4	48.3-51.7	37.9-39.3	21.2-22.4	38.4-45.9	57 (54)
RenShape® SL 7545	Clear amber	430	79	1.4-1.6	50.3-55.2	34.5-39.3	12-21	26.7-37.3	50 (45)

ABS-Like

RenShape® SL 7560	White	250	86	2.4-2.6	82.8-103.4	41.4-62.1	6-15	26.7-42.7	58 (-)
RenShape® SL 7580	White	580	84	2.3	82.8	53.1	11	32.0	63 (52)

High Heat

RenShape® SL 5530	Clear amber	270	88	2.6-3.2	62.8-86.9	57.2-61.4	3.8-4.4	21.3	78 (56)
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90 minutes UV post cure. UV post cure + thermal post cure values available for all resins.

ATTENTION SLA 250® SYSTEM AND SLA 500® USERS: Please contact your Huntsman representative for resin options. Huntsman Advanced Materials offers a full line of resins for all machine platforms.

