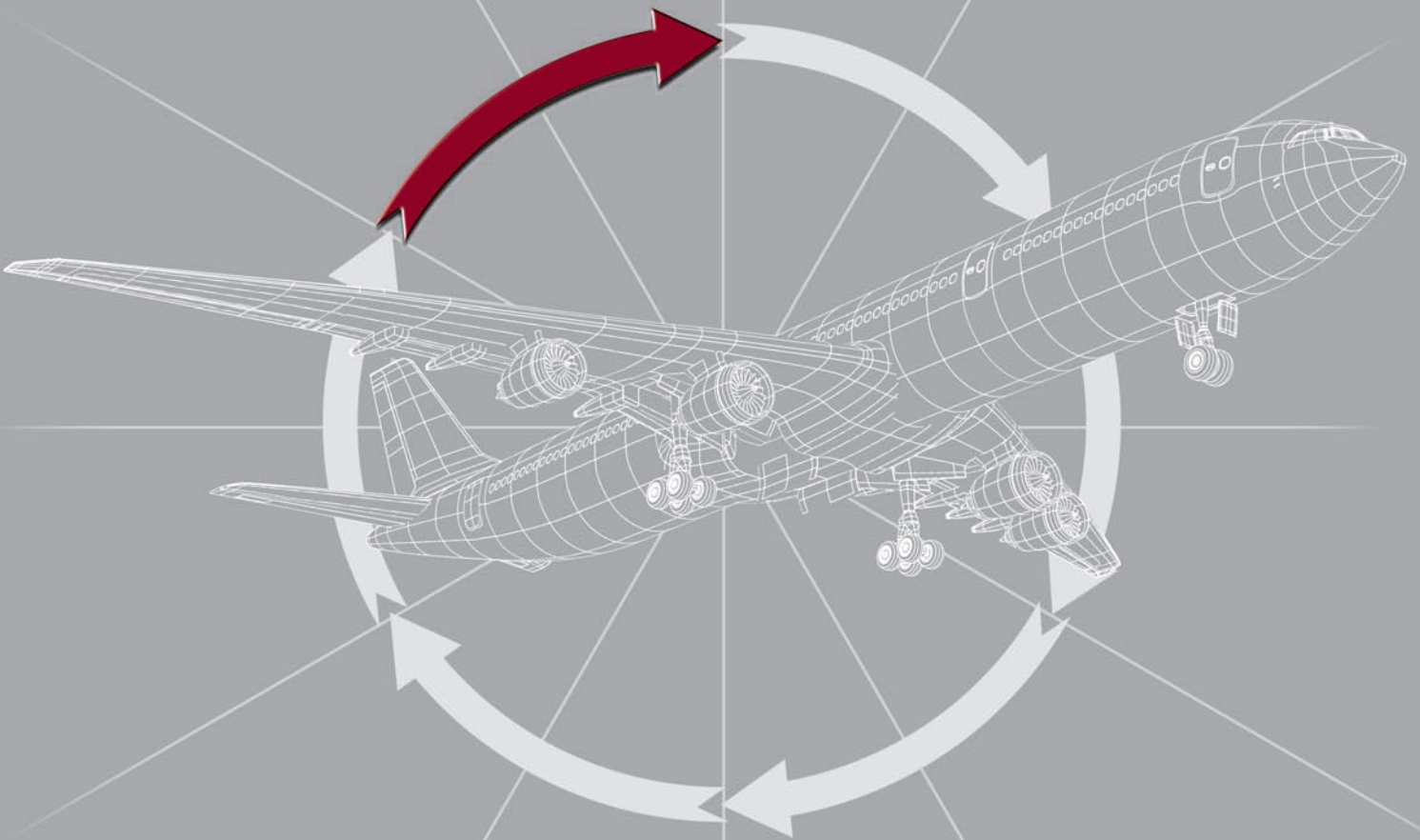


HUNTSMAN

Enriching lives through innovation

Aerospace Design and Prototype Selector guide



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

Modeling and styling boards

Product designation	Colour	Density		Hardness	Compressive Modulus	Coefficient of Thermal Expansion	Tg by DMA	
		Conditions	Unit				RT	(in/in/°F)
				(g/cm³)	(lbs/ft³)	(Shore D)	(psi)	
RenShape® 5020	Lt. Grey			27	-	-	-	-
RenShape® 5025	Lt. Green			27	-	47 x 10 ⁻⁶	176	80
RenShape® 5030	Sienna			30-35	-	-	149	65
RenShape® 5045	Terra Cotta			40-45	-	32 x 10 ⁻⁶	210	99
RenShape® 440	Red/Brown			54	105 000	34.4 x 10 ⁻⁶	203	95
RenShape® 450	Lt. Brown			65	135 000	36 x 10 ⁻⁶	205	96
RenShape® 460	Lt. Brown			64	181 000	29.9 x 10 ⁻⁶	219	104

HDT : Heat Deflection Temperature • RT : Room Temperature = 73.4±3.6°F

Tooling boards

Product designation	Colour	Density		Hardness	Compressive Strength	Compressive Modulus	Coefficient of Thermal Expansion	Tg by DMA	
		Conditions	Unit					RT	RT
				(g/cm³)	(lbs/ft³)	(Shore D)	(psi)	(psi)	

Prepreg lay up (120°C)

RenShape® 550	Cream	0.85	53	82	10 500	415 000	27.5 x 10 ⁻⁶	289	143
RenShape® 5008	Lt. Blue	0.67	42	68	8 200	350 000	18 x 10 ⁻⁶	258	126

Stretch dies / jigs

RenShape® 470	Lt. Grey	1.67	104	90	9 500	860 000	22.7 x 10 ⁻⁶	232	111
RenShape® 472	Lt. Grey	0.88	55	81	10 900	460 000	2.8 x 10 ⁻⁶	248	120
RenShape® 473	Lt. Grey	0.80	50	73	3 500	210 000	30 x 10 ⁻⁶	212	100
RenShape® 5166	Cream	1.66	103	90	9 500	840 000	22 x 10 ⁻⁶	228	109

Foundry

RenShape® 5169	Red	1.20	75	85	8 800	366 000	41 x 10 ⁻⁶	206	97
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HDT : Heat Deflection Temperature • RT : Room Temperature = 73.4±3.6°F

Seamless modeling pastes and patty

Product designation	Mix Ratio	Consistency	Density	Hardness	Pot Life	Compressive Strength	Flexural Strength	Coefficient of Thermal Exp.	Tg E'-DMA		Curing Time
									Conditions	Unit	
						(lbs/ft³)	(Shore D)	(min)	(psi)	(psi)	
RenPaste® 4503-1 / Ren® 4503-1	1/1	Paste	47	55-60	15	2 200	1 760	101 10 ⁻⁶ K ⁻¹	108	42	24
RenPaste® 4569 / Ren® 4569	1/1	Paste	100	80	240-320	8 200	5 650	30 x 10 ⁻⁶	183	84*	48
RP 4040	-	Clay-like	100	88	-	20 500	8 140	9 x 10 ⁻⁶	324	162*	-
XB 4633 Resin / Hardener	2/1	Paste	58	80	-	20 600	9 260	40-45 10 ⁻⁶ K ⁻¹	-	200*	48**

* After heat cure • ** After post-cure • RT : Room Temperature = 73.4±3.6°F

Infusion systems

Product designation	Mixed Viscosity	Gel Time	Glass Transition Temperature E' DMA		Characteristics		
			Conditions	@ 77°F (25°C) - 14 fl. Oz. Unless stated			
			Norm	ASTM D-2393		ASTM D-2471	
			Unit	(cps)		(min)	(°F)
RenInfusion® 8601 / Ren® 8601	175	132	150	66*	150°F cure		
RenInfusion® 8601 / Ren® 8602	175	70	140	60*	RT cure		
RenInfusion® 8603 / Ren® 8603	240	80	167	75	RT cure		
RenInfusion® 8604 / Ren® 8604	370	120	167	75	RT cure		
RenInfusion® 8605 / Ren® 8605	600	540**	307	153	350°F cure		
RenInfusion® 8610 (One component)	320 @ 50°C	-	305	153	350°F cure		
RenInfusion® 8612 (One component)	400 @ 50°C	-	200 by TMA	95 by TMA	300°F cure		
RenInfusion® 8613 / Ren® 8613	430	25 hrs***	381	194	350°F use system		
RenInfusion® 8615 / Ren® 8615	550	18 hrs***	422	216	400°F max. use system		

RT : Room Temperature = 73.4±3.6°F • * E' • ** 100 g mass • *** 4 fl oz

High temperature laminating also suitable for infusion

Product designation	Colour	Mix Ratio	Pot Life	HDT	Curing	Characteristics	
			Conditions	@ 77°F (25°C) - 4 fl. Oz. Unless stated	@ 264 psi		
			Unit	ASTM D-2471			
				(min)	(°F) (°C)		(°F)

Room temperature systems

RenLam® 1700-1 / Ren® 1700-1	Lt. Yellow	100 / 26	20	128 (53)	RT	Unfilled
RenLam® 1700-1 / Ren® 956	Lt. Yellow	100 / 23	36	128 (53)	RT	Unfilled
RenLam® 1700-1 / Ren® 3209-1	Lt. Yellow	100 / 42	47*	-	RT	Unfilled
RenLam® 1710 / Ren® 1710	White	100 / 16	22	129 (53)	RT	Filled
RenLam® 1710 / Ren® 956	White	100 / 16	35	-	RT	Filled
RenLam® 1710 / Ren® 3209-1	White	100 / 18	96*	113 (45)	RT	Filled
RenLam® 1720 / Ren® 1720	White	100 / 15	24	-	RT	Filled
RenLam® 1720 / Ren® 956	White	100 / 15	40**	-	RT	Filled

120°C heat-resistant systems

RenLam® 4005 / Ren® 1500	Amber	100 / 14	55	289 (143)	300	Unfilled
RenLam® 4005 / Ren® 1510	Amber	100 / 16	160*	329***	300	Unfilled
RenLam® 4014 / Ren® 1500	Grey	100 / 11	55	333***	300	Filled
RenLam® 4014 / Ren® 1510	Grey	100 / 14	90*	350***	350	Filled
RenLam® 4014 / Ren® 1511	Grey	100 / 23	190	338***	350	Filled

High temperature laminating also suitable for infusion (following)

Product designation	Colour	Mix Ratio	Pot Life	HDT	Curing	Characteristics
Conditions			@ 77°F (25°C) - 4 fl. Oz. Unless stated ASTM D-2471	@ 264 psi		
Unit			(min)	(°F) (°C)	(°F)	

High-temperature systems

RenLam® 4017 / Ren® 1510	Black	100 / 15	90*	350***	350	Filled
RenLam® 4017 / Ren® 1511	Black	100 / 25	90*	–	350	Filled
RenLam® 4017 / Ren® 1520	Black	100 / 28	>8 hrs	415	400	Filled
RenLam® 1310 / Ren® 1510	Black	100 / 15	3 hrs	440	375	Filled
RenLam® 1310 / Ren® 1520	Black	100 / 32	16 hrs	446	375	Filled

*14 fl oz • **2 fl oz • *** Tg by DMA • HDT : Heat Deflection Temperature • RT : Room Temperature = 73.4±3.6°F

Surface coats (Gelcoats)

Product designation	Colour	Mix Ratio	Pot Life	HDT	Curing	Characteristics
Conditions				@264 psi		
Unit			(min)	(°F)	(°F)	

Room temperature

RenGel® 1124 / Ren® 1124	White	100 / 18	25	127	RT	Color change
RenGel® 1126 / Ren® 1126	White	100 / 18	24	127	RT	–

Intermediate temperature

RenGel® 4026 / Ren® 1500	Grey	100 / 10	55	310*	300	–
RenGel® 4026 / Ren® 1501	Grey	100 / 10	35	310*	300	–
RenGel® 4026 / Ren® 1510	Grey	100 / 10	135	335*	300	–
RenGel® 177-144 / Ren® 1500	Grey	100 / 10	60	284*	300	Abrasion resistant
RenGel® 177-148 / Ren® 1500	Dk. Grey	100 / 12	45	268*	300	Polishable

High temperature

RenGel® 1320 / Ren® 1510	Black	100 / 8	4 hrs	396*	375	Graphite fiber reinforced
RenGel® 1320 / Ren® 1520	Black	100 / 19	8 hrs	497*	375	Graphite fiber reinforced

* Tg by DMA • RT : Room Temperature = 73.4±3.6°F

Stereolithography resins - Solid state

Product designation	Colour	Viscosity	Hardness	Flexural Modulus	Ult. Tensile Strength	Elongation	Notched Izod Impact	HDT	Comments
Conditions		28°C		RT	RT	RT	@ 264 psi		
Unit		(cps)	(Shore D)	(psi)	(psi)	(%)	(Ft-lbs/in)	(°F)	

General purpose

RenShape® SL 5195	Amber	180	83	236 000	6 740	11	1	109	Solid and QuickCast™
RenShape® SL 5510	Amber	180	86	443 000	11 100	5.40	0.50	127	Solid and QuickCast™
RenShape® SL 7510	Amber	325	87	271 000	7 340	4.20	0.50	113	Water resistant
RenShape® SL 7520	Amber	450	86	420 000	9 200	6.20	0.24	120	Exceptional green strength
RenShape® SL 7565	Clear	206	84	287 000	7 200	24	0.60	122	General purpose
RenShape® SL 7800	Lt. Amber	205	87	350 000	6 400	14	0.92	144	Solid and QuickCast™
RenShape® SL 7810	White	240	87	348 000	6 500	14	0.88	124	Solid and QuickCast™

Durable

RenShape® SL 7540	Cl. Amber	279	79	204 000	5 600	22	0.79	135	Durable - solid state
RenShape® SL 7545	Cl. Amber	350	79	215 000	5 400	16	0.60	120	Durable - solid state

White ABS-Like

RenShape® SL 7560	White	200	86	360 000	6 500	11	0.65	137	ABS Like - solid state
RenShape® SL 7580	White	500	84	340 000	7 700	11	0.60	140	ABS Like - solid state

High heat resistance

RenShape® SL 5530	Cl. Amber	210	88	425 000	8 600	4.20	0.40	172	High heat - solid state
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RT : Room Temperature = 73.4±3.6°F • HDT : Heat Deflection Temperature

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