

Advanced Materials

Tooling Systems

Selector Guide



Huntsman Advanced Materials is a leading global supplier of advanced, high performance materials for the design, prototyping and parts production.

The primary markets we serve include aerospace, automotive, sport and leisure, wind energy, and general industry.

Our products include:

Products for Models, Mould and Tool Making

Renshape®	Modeling Boards
	Tooling Boards - Polyurethanes
	Tooling Boards - Epoxy
RenPaste®	Modeling Paste
	Seamless Modeling Paste
RenCast®	Epoxy Casting Systems
	Net Size Casting Systems
	Fastcast Polyurethanes
RenGel®	Epoxy Gelcoats
	Coupling Coat
RenLam®	Laminating Systems
Ancillaries	Fillers, Wax Sheets and Release Agent



Products for Prototype and Parts Production

Renshape® SL	Stereolithography Materials
RenPIM®	Parts in Minutes- Injection Grade
	Parts in Minutes- Vacuum Grade



Adhesives

Araldite®	Brake Bonding Adhesives
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Business tooling

Since 1947 the **TOOLING BUSINESS** has been developed and considered as a pioneer business.

Tooling materials were marketed under the recognized Ciba Tool® brand name, which has become a synonym for quality, performance and service.

During the Vantico time this brand has become Renshape® Solutions which is still used today.



Industrial adhesives and resins for composites

Since 1946 Araldite® adhesive has been used in industrial applications for high performance bonding and joining .

With the development of its patented technology to bond aluminum and introduction of new technologies using Araldite® adhesives to bond steel components, Huntsman Advanced Materials adhesives became the products of choice for producing the new aluminum Jaguar XJ, Lotus Elise, Vauxhall VX220, Aston Martin Vanquish, Morgan Aero and Audi A8. Similar technologies are being used with Araldite® adhesives to bond steel components on BMW, Mercedes and Volvo vehicles.

Modeling Boards

Product	Colour	Density (g/cm ³)	Shore Hardness D (ISO 868)	Compressive Strength (ISO 604)	Compressive Modulus (ISO 604)	Coefficient of Thermal Expansion (ISO 11359)	Deflection Temperature (ISO 75)	Comments
Renshape [®] BM 5108	White	0.08	–	–	–	–	–	Styling/ Design, ie: Program proving, design studies, supporting structures for paste etc
Renshape [®] BM 5025	Apricot	0.24	–	3.7	140	60-65	60	Styling/ Design, ie: Program proving, design studies, supporting structures for paste etc
Renshape [®] BM 5120	Grey	0.27	–	4-5	225-235	50-60	60	Styling/ Design, ie: Program proving, design studies, supporting structures for paste etc
Renshape [®] BM 5185	Apricot or Brown	0.47	46-54	10-15	500-600	55-60	60-70	Styling/ Design, ie: Program proving, design studies, supporting structures for paste etc
Renshape [®] BM 5440	Brown	0.5	55-60	15-20	600-700	50-55	75-80	Models/Data Control Models, ie: Exterior and Interior cubings, presentation models, wind turbine models
Renshape [®] BM 5460	Brown	0.7	60-65	20-25	910-960	50-55	75-80	Models/Data Control Models, ie: Exterior and Interior cubings, presentation models, wind turbine models
Renshape [®] 460	Brown	0.7	64	15	1200	50-55	104*	Models/Data Control Models, ie: Exterior and Interior cubings, presentation models, wind turbine models

* The parameter here is based on TMA testing method.

Tooling Boards

Product	Colour	Density (g/cm ³)	Shore Hardness 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 Temperature (ISO 75) (°C)	Comments
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Polyurethanes

Renshape [®] BM5112	Grey	2	80-85	-	50-60	2400-2800	95-105	85-90	Hammer forms and flanging tools
Renshape [®] BM5166	Ivory	2	85-90	30-35	90-100	7000-7500	45-50	75-80	Sheet metal forming tools, hammer forms, control fixtures and jigs
Renshape [®] 470	Light grey	2	85-90	-	90-100	7000-7500	40-50	110*	Sheet metal forming tools, hammer forms, control fixtures and jigs
Renshape [®] BM 5266	Dark grey	2	85-90	40-45	125-130	7000-7500	45-50	120-125	Metal forming tools
Renshape [®] BM5172	Green	1	75-85	-	80-90	2000-3000	65-70	80-90	Pattern plates, core boxes, tooling jigs

* The parameter here is based on TMA testing method.

Board Bonding Adhesive

Product	Colour	Mix Ratio (pbw)	Pot Life (mins)	Clamping Time (hr)	Board
RenGel [®] SW 18/ Ren [®] HY 2404	Green	100:20	10-15	1	BM 5055
RenGel [®] SW 18/Ren [®] HY5159	Green	100:16	25	3	BM 5055
RenCast [®] FC 52 Polyol/ FC52 Isocyanate	Light beige	100:100	5-7	3-5	BM 5185
RenCast [®] FC 52 Polyol/ FC52 Isocyanate	Light beige	100:100	5-7	3-5	BM 5030
RenPaste [®] SV 427-2/ Ren [®] HY 5162	Brown	100:35	20	12	BM 5460

Modeling Pastes

Product	Colour	Mix Ratio (pbw)	Pot life at 25°C (min)	Density (g/cm ³)	Shore Hardness D (ISO 868)	Coefficient of Thermal Expansion (ISO 11359) (10 ⁻⁶ K ⁻¹)	Deflection Temperature (ISO 75) (°C)	Flexural Strength (ISO 178) (MPa)	Comments
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
Resin XH 6403 / Hardener XH 6405-1	Orange	100:100	60	0.9	65	-	55-60	-	Easily machinable formulation, suit for all sort of modeling
RenPaste® SV4090/ Ren® HV4090	Orange	40:33.3	45-60	1.08	70-75	-	55-60	-	Easily machinable formulation, suit for jigs & fixtures

* cured at room temperature/ 3 days; **RT=25°C

Seamless Modeling Pastes

Product	Colour	Mix Ratio (pbw)	Recommended Cure Schedule	Density (g/cm ³)	Shore Hardness D (ISO 868)	rown	Deflection Temperature (ISO 75) (°C)*	Compressive Strength (ISO 604)(MPa)*	Flexural Strength (ISO 178) (Mpa)*	Comments
RenPaste® SV 4503-1/ Ren® HV 4503-1	Brown	100:100	Machinable after 1 day (RT** curing)	0.75-0.8	55-60	101	42	11.5	11	Master and data control in layer up to 40 mm
RenPaste® XD 4618-1 A/ Ren® XD 4618-1 B	Grey	100:50:00	Machinable after 2 day (RT** curing)	0.90-0.95	65-75	-	47	51	29	Master and data control in layer up to 20 mm

Net Size Casting Systems

Product	Colour	Mix Ratio (pbw)	Pot Life (min)	Density (g/cm ³)	Shore Hardness D (ISO 868)	Compressive Strength (ISO 604) (MPa)	E-Modulus (ISO604) (MPa)	Coefficient of Thermal Expansion (RT-60) (10 ⁻⁶ K ⁻¹)	Castable Layer Thickness (Shrinkage <1mm/m) (mm)	Deflection Temperature (ISO 75) (°C) (HDT)	Comments
RenCast® 5146/ Ren® 5146	Light Beige	80:100	20-25 (3 KG)	1.2	80	85-90	3000	100	20	75-80	Low viscosity, long pot life
RenCast® 5146/ Ren® 5146/ Cast Iron Powder	Dark Grey	80:100:550	30-40 (3 KG)	3.3	90	115-120	10000	45-50	200	-	For metal like parts (max. exotherm 60°C)
RenCast® 5146/ Ren® 5146/ Filler DT 081	Grey	80:100:110	30-40 (3 KG)	1.9	70-75	65	4500	40-50	100	-	Lower CTE and lower shrinkage (max. exotherm 90°C)
RenCast® 5146/ Ren® 5146/ Filler DT 082	Light Beige	80:100:330	30-40 (3 KG)	1.6	85	90-95	9500	45	250	75-80	Variable filler content possible (max. exotherm 45°C)
RenCast® 5146/ Ren® 5146/ Filler DT 082	Light Beige	80:100:420	30-40 (3 KG)	1.85	85	100-105	10500	40	300	-	High Compressive strength than unfilled system (max. exotherm 40°C)
RenCast® 5146/ Ren® 5146/ Filler DT 082	White	80:100:600	30-40 (3 KG)	1.8	85	75-80	10000	40-45	-	-	High Compressive strength than unfilled system
RenCast® 5146/ Ren® 5146/ Filler DT 082/ Aluminium Powder	Grey	80:100:330:40	30-40 (1 KG)	1.8	85-90	95-100	10000	45	200	-	Lower density metal like parts (max. exotherm 50°C)

Recommended Cure Schedule: 7 days @20-25°C/ 14hr @40°C

Gelcoats

Product	Colour	Mix Ratio (pbwj)	Pot Life (250 ml) (min)	Demoulding Time (hr)	Density (g/cm3)	Shore Hardness D (ISO 868)	Deflection Temperature (ISO 75) (°C)	Comments
RenGel [®] SW 10/ Ren [®] HY 2404	White	100:10:00	20	12	1.5	85-90	60-70	Negatives, moulds and fixtures
RenGel [®] SW 10/ Ren [®] HY 5159	White	100:08:00	60	12	1.5	85-90	80	Negatives, moulds and fixtures
RenGel [®] SW 18/ Ren [®] HY 2404	Green	100:20:00	Oct-15	12	1.3	85-90	85	Wet lay-up tools, vacuum forming tools, RTM moulds
RenGel [®] SW 18/ Ren [®] HY 5159	Green	100:16:00	25	12	1.3	85-90	100	Wet lay-up tools, vacuum forming tools, RTM moulds
RenGel [®] SV 410/ Ren [®] HY 2404	White	100:14:00	20-25	6-Aug	1.4	85-90	60-70	polishable gel-coat, which suit for copy milling molds, transitional mold, jigs & fixtures etc.,
RenGel [®] SW 5289/ Ren [®] HY 2404	Light blue	100:10:00	15-20	12	1.68	85	60-70	polishable gel-coat, which suit for copy milling molds, transitional mold, jigs & fixtures etc.,
RenGel [®] SW 404/ Ren [®] HY 2404	Blue	100:10:00	15	12	1.8	85-90	80	Foundry patterns, copy-milling models
RenGel [®] SW 404/ Ren [®] HY 5159	Blue	100:08:00	50	12	1.8	85-90	100	Foundry patterns, copy-milling models
RenGel [®] SW 419-1 / Ren [®] HY 2419	Black	100:13:00	15-20	12	2.3	85-90	60-70	Sheetmetal forming tools, foundry patterns
RenGel [®] SW 5155/ Ren [®] HY 5159	Grey	100:10:00	30-45	-	1.34	88	115-120	For foam molding, vacuum forming & all sort of heat resistance mold etc.,
RenGel [®] XD 4615/ Ren [®] HY 5159	Black	100:15:00	25	12	1.6	85-90	120	mould production for wet lay up or RTM processes
Coupling Coat P99/ Ren [®] HY 5159	Grey	100:11:00	30	12	1.5	90	120	Universally applicable on the tacky gelcoat
RenCast [®] 6414A / Hardener XD 4625-1	white	100:53:00	10	12	1.08	65	90	PUgelcoat
RenCast [®] 6414A / Hardener XD 4627	Green	100:75	35-40	12	1.06	55-60	70*	PU elastic gelcoat

* It's the glass transition temperature (Tg), which is done via DSC.

Laminating Systems for Tooling Application

Product	Colour	Density (g/cm3)	Mix Ratio (pbw)	Pot Life at 23°C (500ml) (min)	Recommended Cure Schedule (°C)	Deflection Temperature (ISO 75) (°C)	Comments
RenLam [®] LY 5288/ Ren [®] HY 5288	Pale yellow	1.1	100:40	40-50	7days@9RT/14hr@40	47-55(Tg)	Multi-purpose laminating system, suit for all sort of laminated backing , tamping backing etc
RenLam [®] LY 5288/ Ren [®] HY 5298	Pale yellow	1.1	100:23	20-30	8days @RT/ 14hr @40	60-72(Tg)	Multi-purpose laminating system, suit for all sort of laminated backing , tamping backing etc
RenLam [®] M-1/ Ren [®] HY 956	Clear to pale yellow	1.1	100:20	20-30	9days @RT/ 14hr @40	45-50(Tg)	low viscosity, easy for operation
RenLam [®] LY 113/ Ren [®] HY 97-1	Clear pale yellow	0.95	100:30	80	-	121	Low viscosity, long potlife, medium temperature performance
RenLam [®] LY 113/ Ren [®] HY 98	Clear to pale yellow	0.95	100:30	190	-	120	Low viscosity, long potlife, medium temperature
RenLam [®] CY 219/ Ren [®] HY 5160	Pale yellow	1.1	100:50:00	80	7days @RT/ 14hr @40	45-50	Good property with RT cure
RenLam [®] CY 219/ Ren [®] HY 5161	Pale yellow	1.1	100:50:00	40	7days @RT/ 14hr @40	50-55	Good property with RT cure
RenLam [®] CY 219/ Ren [®] HY 5161	Pale yellow	1.1	100:50:00	20	7days @RT/ 14hr @40	55-60	Good property with RT cure
RenLam [®] LY5157/ Ren [®] HY 5159	Grey	1.3	100:11:00	40	-	130	Easy for operation, good perform in temperature medium heat resist
RenLam [®] LY 5210/ Ren [®] HY 5158	Pale yellow	1.1	100:25:00	150	-	160-170	Long potlife with high temperature performance
Resin LSH 69-3A/ Hardener LSH 69B	Grey blue	0.7-0.8	100:10:00	45-60	7days @RT/ 14hr @40	45-50	Fibre reinforced paste, easy to handle
Renlam [®] LV06/ Ren [®] HY 06	Grey blue	1.1	100:15:00	60	7days @RT/ 14hr @40	70	Fibre reinforced paste, easy to handle
Renlam [®] LV10/ Ren [®] HY 97 blue	Grey blue	0.75	100:20:00	60	14 hrs gradually to 120C	125	Fibre reinforced paste, easy to handle

* Room temperature=25°C

CastingSystems

Product	Colour	Mix Ratio (pbw)	Pot life (1000ml) (min)	Viscosity (mPas)	Layer Thickness (mm)	Recommended Cure Schedule eg	Density (g/cm ³)	Shore Hardness D (ISO 868)	Compressive Strength (ISO604) (MPa)	Flexural Strength (ISO 178) (MPa)	Elongation Break (ISO 827-2) (%)	Deflection Temperature (ISO 75) (oC)	Comments
RenCast [®] 2000/ Ren [®] 2000	Grey	100:7	240	10000-30000	<50	3hr @ 60	2	D91	175	95		230	High heat resist, good performance in mechanical properties.
RenCast [®] LC 264-1/ Ren [®] LC 234	Grey	100:12.5	60	20000-30000	30	14hrs gradually to120C	1.7	90	120	65	-	100	High viscosity, heat resist upto 1300C
RenCast [®] CW5156-1/ Ren [®] HY 5158	Grey	100:8	60	20000-30000	<80	24	1.62	D90	140-145	72-77	-	130	High viscosity, heat resist upto 1300C
RenCast [®] CW 2215/ Ren [®] HY 5160	Yellow	100:20	120	4000	<80	7 days @ 25 or 14hr @ 40	1.6	D85-90	80-90	65-75	-	50-55	Mineral filled, low Tg, lower density
RenCast [®] CW 2215/ Ren [®] HY 5161	Yellow	100:20	45	5000	<20	7 days @ 25 or 14hr @ 40	1.6	D85-90	80-90	60-70	-	55-60	Mineral fitted, tow Tg, tower density
RenCast [®] CW 2215/ Ren [®] HY 5162	Yellow	100:20	25	5000	<10	7 days @ 25 or 14hr @ 40	1.6	D85-90	80-90	60-70	-	60-65	Mineral filled, low Tg, lower density
RenCast [®] CW 2418-1/ Ren [®] HY 5160	Black	100:15	120	4000	<80	7 days @ 25 or 14hr @ 40	2.3	D85-90	80-90	80-90	-	50-55	Good abrasion resistant
RenCast [®] CW 2418-1/ Ren [®] HY 5161	Black	100:15	60	5000	<20	7 days @ 25 or 14hr @ 40	2.3	D85-90	80-90	80-85	-	55-60	Good abrasion resistant
RenCast [®] CW2418-1/ Ren [®] HY 5162	Black	100:15	30	5000	<10	7 days @ 25 or 14hr @ 40	2.3	D85-90	80-90	80-85	-	60-65	Good abrasion resistant
RenCast [®] 5073 A/ Hardener XD 4609	caramel	100:20	20-25	4000	<100	14-16	1.1	A45			270		PU casting elasomer series, good abrasion resist, suit for case model of ceramic industry
RenCast [®] 5075 A/ Hardener XD 4609	Light Beige	100:35	20-25	3000	<75	4-6	1.1	A75			376		PU casting elasomer series, good abrasion resist, suit for case model of ceramic industry
RenCast [®] 6414 A/ Hardener XD 4608	Cream	100:41	15-20	5200	<10	24	1.1	D67			127		PU casting elasomer series, good abrasion resist, suit for case model of ceramic industry
RenCast [®] 6414-1 A/ Hardener XD 4609	Light Beige	100:70	15-22	2700	<20	36	1.1	D55			135		PU casting elasomer series, good abrasion resist, suit for case model of ceramic industry
RenCast [®] 6414 A/ RenCast [®] 5117-1B	Cognac	100:40	15-20	4800	10	16-24 hours room temp+14hrs 40C or 7 days room temperature	1.1	67	23	34	110-150		PU casting elasomer series, good abrasion resist, suit for case model of ceramic industry
RenCast [®] 6405 A/B	White	100:100	40-60	200-300	20	7 days @25C or 14hrs @ 40	1.1	70	40	55	—	50	PU Casting

Recommended Cure Schedule: 7 days @25°C/ according to TDS

Fastcast Polyurethanes

Products	Colour	Mix Ratio (pbw)	Pot Life (1 kg) (min)	Density (ISO 1183) (g/cm ³)	Compressive Strength (ISO 604) (MPa)	Compressive Strength (ISO 604) (MPa)	Deflection Temperature (ISO 75) (°C)	Flexural Strength (ISO 178) (Mpa)	Comments
RenCast [®] FC 52 Polyol/ FC 52 Isocyanate	Beige unfilled	100:100	6-8	1	35	1000	80	25	Low viscosity, pigmentable
RenCast [®] FC 52 Polyol/ FC 52 Isocyanate/ 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 Polyol/ FC 53 Isocyanate	Beige unfilled	100:100	3-4	1.1	41	1150	85	41	Low viscosity, fast demould
RenCast [®] FC 53 Polyol/ FC 53 Isocyanate	Beige	100:100:300	5-6	1.6-1.7	45-50	2500	85-90	34	Variable filler content for large casting
RenCast [®] FC 55 Polyol/ FC 55 Isocyanate	Beige	100:100	2-3	1.1	35	900	85	37	Low viscosity, fast cure
RenCast [®] FC 55 Polyol/ FC 55 Isocyanate/ Filler DT 082	Beige	100:100:300	5-6	1.6-1.7	43	2200	90	26	Variable filler content for large casting
RenCast [®] XD 4566 Polyol/ XD 4566 Isocyanate	Beige	100:100	5-6	1.6-1.7	23	600	60-65	29	Toughened fastcast
RenCast [®] XD 4566 Polyol/ XD 4566 Isocyanate/ Filler DT 082	Beige	100:100:300	8-10	1.6-1.7	33	1400	70-75	31	Variable tiller content for large casting

Parts in minutes: Injection grade

Product	Colour	Mix Ratio (pbw)	Pot Life at 25°C (sec)	Demoulding Time at RT (min)	Max Layer Thickness (mm)	Shore Hardness D (ISO 868)	Deflection Temperature (ISO 75) (°C)	Tensile Strength at 25°C (ISO 527) (MPa)	Flexural Strength (ISO 178) (Mpa)	Comments
RenPIM [®] 5213-1 Polyol / 5213-1 Isocyanate	Caramel	100:65	50-70	15-30	3	78-83	90	30-35	1400	Flame retardance to UL94 V-0 simulates PP/ABS
RenPIM [®] 5214 Polyol / 5214 Isocyanate	Beige	100:80	60-80	10-15	4	75-80	120	30-50	1775	High temperature resistance, pigmentable, simulates PP/ABS
RenPIM [®] 5215 Polyol / 5215 Isocyanate	Black	100:80	40-60	10-15	4	75-80	130-140	30-40	1100	High temperature resistance, simulates PP/ABS
RenPIM [®] 5216 Polyol / 5216 Isocyanate	Neutral	100:80	40-60	15-20	5	75-80	80	30-35	1200	Toughened, high impact resistance, pigmentable, simulates PP/ABS
RenPIM [®] 5217 Polyol / 5217 Isocyanate	Black	100:80	40-60	10-15	5	75-80	85-90	35-40	1250	Toughened, high impact resistance, simulates PP/ABS
RenPIM [®] 5218 Polyol / 5218 Isocyanate	Black	100:80	100-130	20-30	4	75-80	90-100	40-45	1900	High flexural modulus, toughened, simulates PP/ABS

* TP=25°C ** Properties after post-cured

Stereolithography

Product	SLA@system	Colour	Viscosity at 28°C (cps)	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)	Comments
Renshape [®] SL 5240	SLA 250	White	350	55	37	24	48	58(50)	ABS like with excellent fine features
Renshape [®] SL 5510	SLA Viper si2	-	230	103	66	5	26	54(47)	High temperature resistant SL material
Renshape [®] SL 5510	SLA350/3500/5000	Clear amber	230	99	77	5	27	62(53)	High temperature resistant SL material
Renshape [®] SL 7520	SLA 7000	Clear amber	570	100	64	6	17	54(49)	PP like suitable for "snape-fit" parts
Renshape [®] SL 7545	SLAViper Si2 3500/5000/7000	White	430	58	38	17	34	49(46)	Durable SL material that simulates ABS-like parts
Renshape [®] SL 7560	SLA Viper si2 3500/5000/7000	White	250	94	52	11	36	58(-)	Durable SL material that simulates ABS-like parts
Renshape [®] SL 7580	Solid state laser	White	580	82.8	53.1	11	32	63(52)	ABS like with good temperature performance

Ancillaries

Product	Description	Comments
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Fillers

Filler DT 081	Grey, light mineral filler	Filler for various applications
Filler DT 082	White metalloxid filler	Filler for various applications
Freeman [®] Wax Sheets	Self adhesive wax sheets in different thicknesses	Spacing layers to simulate work piece thickness

Release Agent

RenLease [®] QZ 5101	Mould sealer, water soluble	For sealing of plastic, rubber, wax, etc
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

Brake Bonding adhesives

Product	Colour	Solid Content (weight)	Application Method*	Solvent	Drying Time at 23°C	Drying time at 70°C	Curing Schedule Pressure (MPa)	Curing Schedule Temp (°C)	Curing Time (min)
Araldite [®] 64-1	Clearbrown	39-44%	Sp, Br, Rc	Ethanol / Toluene	6 hr	25 min	0.35-1	200	5
Araldite [®] 70	Clear brown	38-44%	D,Sp	Ethanol	20 min	5 min	-	200	5
Araldite [®] 71	Dark brown	47-51%	Ex, Rc	Ethanol	8-10 hr	25 min	0.35-1	200	5

* D = Dip / Rc = Roller coat / Sp = Spray / Ex = Extruder / Br = Brus

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HUNTSMAN

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