

Advanced Materials

**HUNTSMAN**

Enriching lives through innovation

# Araldite®

Reliable and comprehensive bonding solutions



Raising  
performance  
in automotive  
industry



# Our mission: provide unique bonding technologies that create value for our customers

## Araldite®

The adhesives serving worldwide manufacturing industry for more than half a century

Whilst the level of global business competition in automotive is high, manufacturers need solutions to help sustain their competitive edge and secure long-term growth. Production process improvement, innovation in design, weight savings, compliance to stringent safety and environmental standards, and low process costs have become vital to success.

In this context, adhesives can play an even greater role, providing well established solutions as well as more advanced and innovative developments for all kinds of bonding applications.



## Adhesives deliver long term performance and durability

Adhesive bonding enables the most efficient use of materials, maximising their long-term potential while optimising manufacturing methods with easy handling and processing.

Compared to mechanical joining, adhesive bonding allows the assembly of dissimilar substrates and higher weight loads to be carried while offering more uniform stress distribution across the entire bonded joint and superior fatigue resistance.

Adhesives facilitate the integrity and strength of materials as there are no holes, rivets or fastening elements to weaken the structure. Without any visible joining elements, nothing detracts from the aesthetics of the finished parts and greater lightweight design flexibility can be achieved.

Additionally, adhesives offer the potential to reduce costs in parts production through streamlined assembly processes and hence faster cycle times.

Therefore adhesives have become essential in manufacturing exterior and interior parts in order to deliver superior performance, durability, and aesthetic.

## We deliver more than just products

Huntsman offers a wide range of high performance structural adhesives for automotive suppliers and repair shops who require high strength in their assemblies at reduced production process costs without compromising on safety requirements.

Our products help overcome a variety of challenges such as low emission, fast curing cycles with high initial green strength, durability under dynamic stress, impact resistance, and multi-substrate joining.

As a strategic partner to the automotive industry for many years, we tailor our products and services to the evolving needs of this market. Based on state-of-the-art epoxy, polyurethane, methyl methacrylate and phenolic technologies, our adhesives have specific characteristics that help end-users improve their manufacturing processes, secure long-term performance and safety of assemblies, and use materials that enable car lightweighting. This results in higher productivity rates, increased design freedoms and a better energy efficiency of the cars.

All our products are tested in-house in certified mechanical and electrical testing laboratories to ensure they provide the desired properties. Moreover Huntsman's global manufacturing footprint, local technical support and commercial teams ensure close proximity with our customers.





# Strength in bonding

The Araldite® adhesives range for automotive contains a selection of adhesives from the latest epoxy, polyurethane, methacrylate and phenolic technologies to meet the great majority of high-performance bonding applications.

## Araldite® adhesives range for automotive

From adhesives with long open times for large area applications to fast-curing adhesives for early removal from fixtures and rapid through-put, this range includes adhesives which are resistant to high temperature, water and chemicals. Liquid adhesives as well as thixotropic adhesives for gap-filling or vertical applications can be found in this range. Adhesives with highest strength can be selected from this range as well as tough and impact-resistant adhesives with a well-balanced combination of strength and flexibility and also elastic adhesives to cope with different thermal expansions when bonding larger structures of dissimilar materials.

Products from the Araldite® adhesives range for automotive are available in a variety of packaging including easy-to-use cartridges with static mixers and working packs for manual applications as well as hobbocks and drums for higher volume applications. The Araldite® adhesives range for automotive will continuously be updated to meet the newest demands of innovative design using the bonding technology.



## Epoxies

### 1-C epoxy adhesives

- > excellent adhesion to metals, thermoset and thermoplastic composites
- > outstanding lap shear strength and peel strength
- > high fatigue resistance
- > very high impact resistance
- > excellent chemical resistance
- > easy processing

### 2-C epoxy adhesives

- > excellent adhesion to metals and thermoset composites
- > high strength and high stiffness
- > high creep resistance
- > high fatigue resistance
- > high temperature resistance (adhesive specific up to 210°C)
- > excellent chemical resistance
- > low shrinkage

## Methacrylates

### 2-C methyl methacrylate adhesives

- > excellent adhesion to metals, thermoset composites and most thermoplastics
- > good adhesion with minimum surface preparation
- > tolerant to mix-ratio variations
- > wide spectrum of available reactivity
- > optimum ratio open-time / cure time
- > mechanical properties from rigid to flexible
- > good long-term durability

### No-mix methyl methacrylate adhesives

- > long open-time and rapid cure
- > good adhesion with minimum surface preparation
- > high process flexibility
- > suitable for high production speed
- > high toughness
- > good long-term durability

## Polyurethanes

### 2-C polyurethane adhesive

- > excellent adhesion to most thermoplastics and composite materials
- > good adhesion to metals
- > mechanical properties from rigid to flexible
- > good long-term durability
- > good combination of strength and flexibility

## Phenolics

- > excellent adhesion to metals and friction materials
- > outstanding temperature resistance
- > excellent chemical resistance
- > easy to apply
- > virtually «infinite» open time once applied



Product designation	Structural / semi-structural assemblies				Exterior finishers / interior modules							Lights / headlamps				Brake / clutch bonding			Electronics			Filters				Repair / aftermarket		
	Steel	Alu	CFRP	GRP / SMC	Steel	Alu	CFRP	GRP / SMC	Thermo-plastics	Painted metal	Foams	Glass	PC	Acrylic plastics*	Thermo-plastics**	Steel	Alu	Friction material	PCB	Copper	Ferrite	Steel	Alu	Polyamide	Fabric	Metals	Composites	Thermo-plastics
Araldite® 2011	•	•	•	•	••	••	•	•	•	••	••		•	•					•	•	•					••	••	•
Araldite® 2012	•	•	•	•	••	••	•	••	•	•	•		•	•					•	•	•					••	••	•
Araldite® 2013-1	•	•	•	•	••	••	•	•	•	•									•	•	•					••	••	•
Araldite® 2014-2	••	••	••	••	••	••	••	••	•	•									••	••	••	••	••	••	••	••	••	•
Araldite® 2015-1	••	••	••	••	••	••	••	••	•	•									•	•	•	•	•			••	••	•
Araldite® 2031-1	••	••	••	••	••	••	••	••	•	•									•	•	•					••	••	•
Araldite® AW 2101 / HW 2951	•	•	•	•	••	••	•	•		•									•	•	•					••	••	
Araldite® AW 4858 / HW 4858	••	••	••	••	••	••	••	••	•	••									•	•	•					••	••	•
Araldite® AW 4859 / HW 4859	••	••	••	••	••	••	••	••	•	•									•	•	•							
Araldite® 2033	•	•	•	•	•	•	•	•	•										••	••	••							
Araldite® AV 4600	••	••	••	••	••	••	••	••	•	•																		
XD 4567 / XD 4568																						••	••	••	••			
Araldite® AW 4752 / Hardener HW 4753																						••	••	••	••			
XB 5090-1 / Arathane® HY 5611-1							•		••		••											••	••	••	••			
Araldite® 2018									••	••	••	••	••	••	••	••												••
Araldite® 2026									••	••	•	••	••	••	••	••												••
Araldite® 2028-1									••	••	•	••	••	••	••	••												••
Araldite® 2029-1	•	•	••	••	••	••	••	••	••	••	•															••	••	••
Araldite® 2021-1	•	•	•	•	••	••	•	•	••				••	••	••	••										••	••	••
Araldite® 2022-1	•	•	•	•	••	••	•	•	••				••	••	••	••										••	••	••
Araldite® 2047-1	•	•			••	••			••																	••		
Araldite® 2048-1	•	•	•	•	••	••	••	••	••	•									••	••	••					••	••	••
Araldite® 2052-1	••	••	•		••	••	•		••										••	••	••					••		
Agomet® F 300 A/B					••	••			••										••	••	••							
Agomet® F 330 hardener lacquer					••	••			••										••	••	••							
Araldite® 64-1												••	••	••														
Araldite® 71												••	••	••														

•• Recommended | • Suitable | \*PMMA, ASA, SAN | \*\*housing | Non exclusive selection - Ask our experts for other solutions.



# Araldite®

## Reliable and comprehensive bonding solutions for automotive industry

### 1 Structural / semi-structural assemblies

**Door modules, composite shells, transmission shafts, structural modules**

**Your needs**

- > Improve the fatigue resistance of the metal assemblies
- > Reduce the overall weight of the structure
- > Prevent and reduce corrosion of metal
- > Uniform stress distribution and larger stress bearing areas
- > High toughness
- > Gap filling
- > Very high fatigue, and thermal shock resistance
- > Excellent moisture and chemical resistance
- > Easy automation

**Our solutions**

Araldite® 2014-2  
Araldite® 2015-1  
Araldite® 2031-1  
Araldite® 2052-1  
Araldite® AW 4858 / HW 4858  
Araldite® AW 4859 / HW 4859  
Araldite® AV 4600

### 2 Exterior finishers / interior modules

**Spoiler, door capping, side blade, exterior trim, seat, cockpit**

**Your needs**

- > Multimaterial assemblies
- > Ease of application
- > Toughness, shock resistance
- > Aesthetical design
- > Weathering resistance

**Our solutions**

Araldite® 2012  
Araldite® 2015-1  
Araldite® 2021-1  
Araldite® 2047-1  
Araldite® 2048-1  
Agomet® F300 A/B  
Araldite® AV 4600

### 3 Lights / headlamps

**Headlights, brake lights, reflector housings**

**Your needs**

- > Multimaterial assemblies
- > Good adhesion to glass, PC, acrylics and thermoplastics
- > Minimal fogging
- > Aesthetical design, transparent adhesives

**Our solutions**

Araldite® 2018  
Araldite® 2021-1  
Araldite® 2022-1  
Araldite® 2026  
Araldite® 2028-1

### 4 Brake / clutch

**Brake shoes, brake pads, friction lining material for clutches, dip-coating**

**Your needs**

- > Very high temperature resistance
- > Very good adhesion to friction material
- > Very good adhesion to steel and aluminum

**Our solutions**

Araldite® 64-1  
Araldite® 71

### 5 Electronics

**Control units, climate controls, navigation systems**

**Your needs**

- > Multimaterial assemblies (copper, ferrite, PCB ...)
- > Good thermal resistance
- > Weathering resistance
- > Electrical insulation
- > Low outgasing
- > Flame retardancy

**Our solutions**

Araldite® 2014-2  
Araldite® 2033  
Araldite® 2048-1  
Araldite® 2052-1  
Agomet® F 300 A/B  
Araldite® F 330

### 6 Filters

**Hydraulic filters, oil filters, air filters**

**Your needs**

- > High chemical resistance
- > High temperature resistance
- > Self-levelling adhesives

**Our solutions**

Araldite® 2014-2  
XD 4567 / XD 4568  
Araldite® AW 4752 / HW 4753  
XB 5090-1 / Arathane® HY 5611-1

### 7 Repair / aftermarket

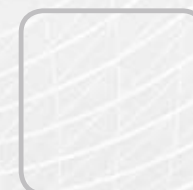
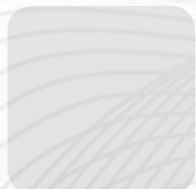
**Cracks repair, metal bonding, SMC bonding**

**Your needs**

- > Multimaterial assemblies
- > Very good weathering resistance
- > High fatigue and vibration resistance
- > Easy to use packaging

**Our solutions**

Araldite® 2011  
Araldite® 2013-1  
Araldite® 2022-1  
Araldite® 2029-1  
Araldite® 2048-1  
Araldite® AW 2101 / Hardener HW 2951



Non exclusive selection - Ask our experts for other solutions.





6 Filters



5 Electronics



2 Cockpit



1 Door modules



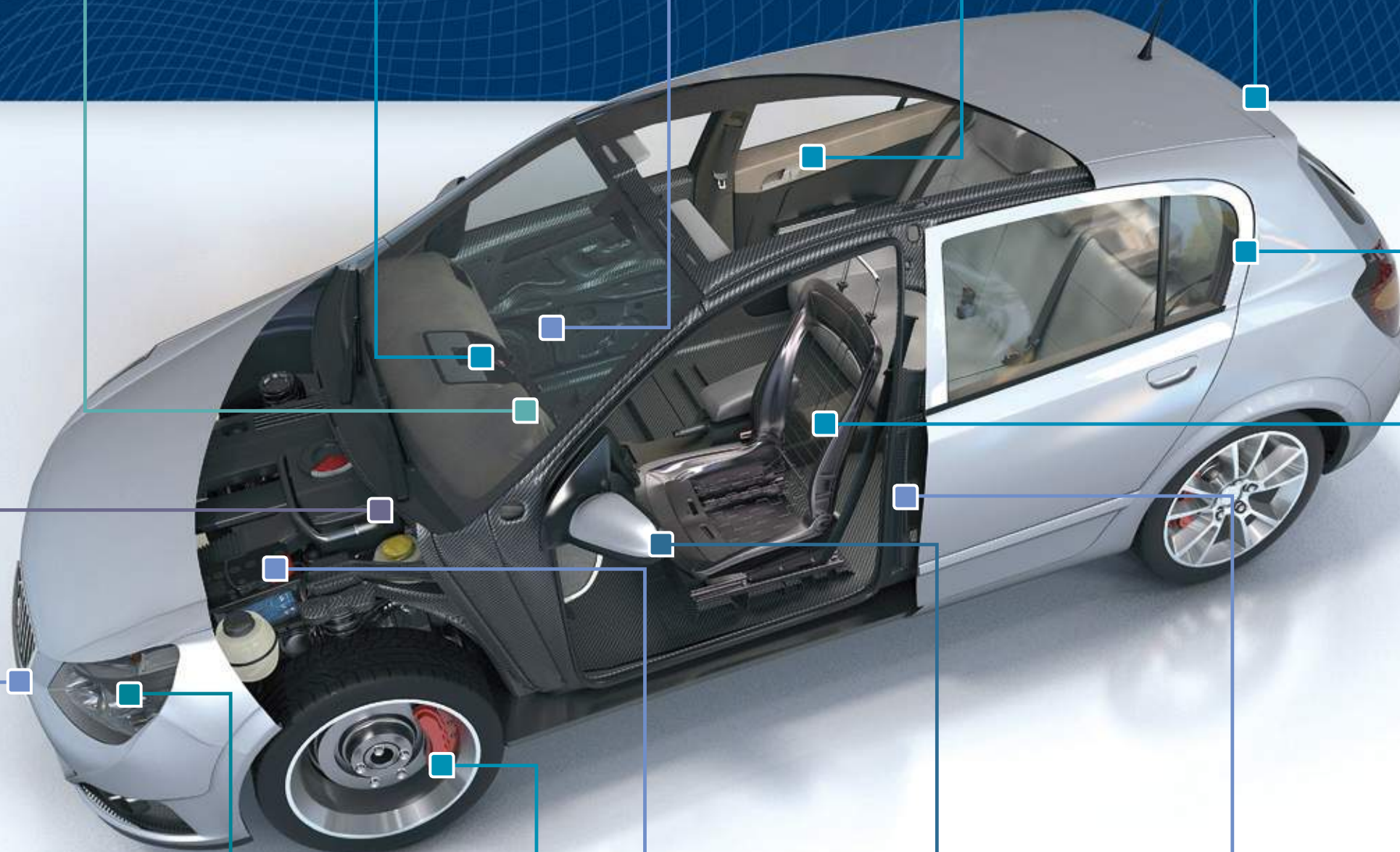
2 Door capping



2 Spoiler



2 Exterior trims



1 Bumpers



3 Headlamps, brake lights and reflector housing



4 Brake shoes, pads and clutch friction material



1 Motor parts



7 Repair



1 Structural modules



2 Seats



Products		Technology	Mix ratio	Color	Pot life	Fixture time	Gap filling	Lap shear strength on aluminum*	Tensile modulus**	Elongation at break**	Key benefits
Cartridge	Bulk		volume		min	min	mm	MPa	MPa	%	
Araldite® 2011	Araldite® AW 106 / Hardener HV 953U	EP	100 : 100	pale yellow	100	420	1	26	1 900	9	Multipurpose, medium viscosity, long open time.
Araldite® 2012	Araldite® AW 2104 / Hardener HW 2934	EP	100 : 100	pale yellow	6	20	0.5	18	2 500	4	Multipurpose, medium viscosity, fast cure.
Araldite® 2013-1	Araldite® AV 144-2 / Hardener HV 997-1	EP	100 : 100	grey	80	300	5	20	1 400	2	Grey metal colored, non sagging paste, high toughness.
Araldite® 2014-2	Araldite® AW 139-1 / Hardener HW 5323-1	EP	100 : 50	dark grey	110	300	5	17	3 000	1	Resistance to high temperature, excellent chemical resistance, room temperature cure.
Araldite® 2015-1	Araldite® AV 5308 / Hardener HV 5309-2	EP	100 : 100	beige	45	240	10	19	1 600	4	High toughness, excellent weathering resistance, good temperature resistance.
Araldite® 2031-1	Araldite® AV 4076-1 BK / Hardener HV 5310 BK	EP	100 : 100	black	60	180	10	22	1 000	10	High toughness, excellent weathering resistance, non sagging paste.
Araldite® AW 2101 / HW 2951	Araldite® AW 2101 / Hardener HW 2951	EP	100 : 100	grey	6	60	5	20	5 500	1	Fast cure, non sagging paste, high strength, sandable.
Araldite® AW 4858 / HW 4858	Araldite® AW 4858 / Hardener HW 4858	EP	100 : 50	black	150	360	10	38	1 600	10	High lap shear strength, high peel strength, high toughness.
Araldite® AW 4859 / HW 4859	Araldite® AW 4859 / Hardener HW 4859	EP	100 : 50	black	100	270	10	33	1 500	5	High temperature resistance, high peel strength, gap filling.
Araldite® 2033	Araldite® AW 4833 / Hardener HW 4833	EP	100 : 100	black	120	240	5	16	2 500	1	Self extinguishing, UL 94 V0 (4.5 mm), gap filling, long open time.
	Araldite® AV 4600	EP	n.a.	orange	n.a. 1 component epoxy	n.a. 1 component epoxy	3	40	4 000	5	Outstanding peel strength, high temperature resistance.
	XD 4567 / XD 4568	EP	100 : 30	light grey	4	150	1	15	1 300	4	Self levelling, fast gelling, outstanding chemical resistance.
	Araldite® AW 4752 / Hardener HW 4753	EP	100 : 50	dark grey	40	420	1	16	5 500	1	Self levelling, long working time, outstanding chemical resistance.
	XB 5090-1 / Arathane® HY 5611-1	PU	100 : 25	beige	100	360	< 1	20	27	40	Easy to spread, long potlife, good environmental and chemical resistance.
Araldite® 2018	Araldite® AY 4446 / Hardener HY 4445	PU	100 : 100	opaque	40	240	1	7	15	45	UV stable, flexible, suitable for bonding thermoplastics.
Araldite® 2026	Araldite® AY 4700 / Hardener HY 4710	PU	100 : 100	crystal clear	4	60	< 1	21	200	50	Transparent clear, UV stable, flexible.
Araldite® 2028-1	Araldite® 8629-1 polyol / Araldite® 8628 isocyanate	PU	100 : 100	crystal clear	6	30	<1	15	15	60	Transparent clear, UV stable, fast curing.
Araldite® 2029-1	Araldite® AW 4840-1 / Hardener HW 4841	PU	100 : 100	dark grey	40	240	5	24	550	40	High elongation at break, high strength, non sagging paste.
Araldite® 2021-1	Araldite® F 361-1 / Hardener F 361-1	MMA	100 : 100	pale yellow	3	9	3	25	2 000	10	Very fast cure, high strength, high toughness.
Araldite® 2022-1	Araldite® F 362-1 / Hardener F 362-1	MMA	100 : 100	pale yellow	10	12	3	25	2 000	5	Fast cure, high strength, high toughness.
Araldite® 2047-1	Araldite® F 347 / Hardener K 100-1 red	MMA	100 : 10	brown	10	15	3	18	850	30	Good adhesion on difficult to bond metals, fast cure, good flexibility.
Araldite® 2048-1	Araldite® F 348 / Hardener F 348-1	MMA	100 : 10	black	10	35	8	24	350	90	High flexibility, gap filling, fast cure, low chlorine content.
Araldite® 2052-1	Agomet® F 252 / Hardener K 100-1 red	MMA	100 : 10	red	15	20	3	24	1 700	10	High temperature resistance, high strength, fast cure, toughened.
	Agomet® F 300 A/B	MMA	6% hardener powder	reddish brown	2	3	2	23	2 300	7	«No mix» system, very fast handling strength, high strength and toughness, medium viscosity.
	Agomet® F 330 hardener lacquer	MMA	hardener lacquer	beige	10	20	< 0.5	35	1 500	5	«No mix» system, 10 minutes work life, 20 minutes handling strength, resistance to high temperature.
	Araldite® 64-1	Phenolic	n.a.	black	n.a.	n.a.	< 0.5	8	n.a.	n.a.	Very high temperature resistance, «infinite» open time, suitable for use as an adhesive or dilution to primer viscosity.
	Araldite® 71	Phenolic	n.a.	brown	n.a.	n.a.	< 0.5	8	n.a.	n.a.	Very high temperature resistance, «infinite» open time, extrudable.

EP = Epoxy | PU = Polyurethane | MMA = Methyl methacrylate | \*measured following ISO 4587 (Curing 16h at 40°C) | \*\*measured following ISO 527 (Curing 16h at 40°C) | Cure temperature at RT possible (full cure achieved after 7 days) | Non exclusive selection - Ask our experts for other solutions.





# We value your challenge

By providing unique, certified or patented technologies, combined with high quality and reliability, our chemists and experts bring enhanced value to our customers, ensuring their success.

## With innovation

Every day, all over the world, our Technical Competence centers engage in intensive research and development focusing on one goal : to deliver innovative solutions by working hand-in-hand with our business partners. Together through a continual exchange of ideas, supported by an experienced team of sales and technical specialists, we strive to deliver innovative and regulatory compliant (eg REACH compliant) solutions.

We track both new market expectations and changing regulations. Protection of the environment, as well as health and safety are paramount concerns, playing an integral part in our development projects.



## With customer intimacy

We market a unique product portfolio and a broad range of forward-looking solutions for our customers. Customers and partners benefit from an advanced level of service in:

- > product selection and quality
- > product trials in-house and with customers
- > customer seminars and trainings
- > technical service and solution-providing

Partnership with our customers is more than simply «putting them first». It requires long-term commitment to forging close relationships that create synergies of knowledge, security and adaptability to create a successful, shared future.

## With care

Sustainability is a fundamental part of our corporate and business strategy. We see a better world in which our innovations help reduce consumption of natural resources and improve the quality of life for people everywhere. We are identifying the long - term trends that affect our markets and looking to see how products and applications can play a part in supporting and providing solutions to the challenges those markets face.





## Huntsman Advanced Materials

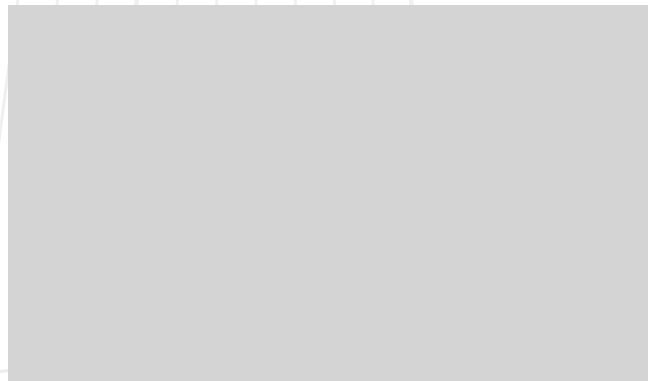
Our Advanced Materials division is a leading global chemical solutions provider with a long heritage of pioneering technologically advanced epoxy, acrylic, phenolic and polyurethane-based polymer products.

Our capabilities in high-performance adhesives and composites, delivered by more than 1 600 associates, serve over 2 000 global customers with innovative, tailor-made solutions and more than 1 500 products which address global engineering challenges.

## We operate synthesis, formulating and production facilities around the world



## Distributed by



## Find the right adhesive to fulfill your needs



[www.AralditeAdhesives.com](http://www.AralditeAdhesives.com)

# HUNTSMAN

Enriching lives through innovation

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