

# **Araldite**<sup>®</sup>

Reliable and comprehensive bonding solutions





# 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

Structural bonding techniques play a key role in today's assembly operations. As designers strive to bring lightweight and durable products to market in the quickest time possible, they increasingly choose industrial adhesives as the best solution for complex design issues.

Based on 60 years heritage as pioneers in high performance adhesive technology, Huntsman has developed an extensive range of adhesives to provide solutions to the great majority of design issues engineers face on a daily basis.





# 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's high performance structural adhesives are designed for those who require high strength in their assemblies at reduced production process costs. Our products help overcome a wide variety of challenges such as fast curing cycles with high initial green strength, durability under dynamic stress, impact resistance, corrosion resistance, and multi-substrate joining.

As a strategic partner to many industries, our company keeps on tailoring its products and services to the evolving needs. Based on state-of-the-art epoxy, polyurethane and methyl methacrylate technologies, Araldite® adhesives provide superior joining and bonding solutions for plastics, metals, composite materials and other substrates. This results in higher productivity rates, increased design freedoms, secured long-term performance and safety of assemblies.

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



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





# Araldite® adhesives range for assembly operations

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 assembly operations are available in a variety of packaging including easy-to-use cartridges with static mixers and working packs for manual applications as well as hobbooks and drums for higher volume applications. The Araldite® adhesives range for assembly operations 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
- > 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
- > good long-term durability
- > good combination of strength and



Reliable and comprehensive bonding solutions

The Araldite® adhesives range offers high performance bonding solutions for a wide variety of applications in assembly operations and maintenance. Our products have been designed to meet the key requirements of many industry sectors.

- > Electrical engineering and electronics
- > Filter manufacturing
- > Heating, ventilating, air conditioning
- > Machineries
- > Marine
- > Medical
- > On-site and off-site construction
- > Pipes and tanks
- > Renewable energies
- > Sign and display
- > Sport and leisure
- > Transportation
- > White goods



# Reliable and comprehensive bonding solutions



# Short pot life - less than 10 minutes

Product designation		Techno- logy	Pot life	Fixture time	Key benefits	Color	Viscosity	Gap filling capability		Elongation at break*	Lap shear strength on aluminum**	Maximum service tempera- ture***	Resistance to water / humidity	Resistance to chemicals	Mix ratio - by weight - by volume	Metals	Thermose			Various substrates
																Mild steel Stainless steel Galvanized steel Aluminium Copper Brass	GRP (UP) GRP (EP) CFRP	SMC PVC	ABS, ASA, SAN PC PMMA	Ceramic Glass Rubber Wood
Conditions			100g at 23°C			mixed														
Unit			min	min			Pa·s	mm	MPa	%	MPa	°C								
Bulk	Cartridge																			
Araldite® AW 4428 / Hardener HW 4455		EP	1.5		Very short gel time Multipurpose	yellow	25	1	1 100	5	22	60	•	•	100 : 100 100 : 100					
Araldite® F 361-1 / Hardener F 361-1	Araldite® 2021-1	MMA	3		Non-sagging Toughened	yellow	thixotropic	3	1 800	10	25	100	:	:	100 : 100 100 : 100					
Araldite® AY 4700 / Hardener HY 4710	Araldite® 2026	PUR	4		Transparent Flexible	transparent	10	<1	200	50	21	60	•	•	100 : 100 100 : 100					
Araldite® AY 8629-1 / Hardener HY 8628	Araldite® 2028-1	PUR	6		Transparent UV Stable	transparent	5	<1	15	60	15	55	•	•	100 : 100 100 : 100					
Araldite® AW 2104 / Hardener HW 2934	Araldite® 2012	EP	6		Short gel time Multipurpose	yellow	30	0.5	2 500	4	18	70	•	:	100 : 100 100 : 100					
Araldite® AW 2101 / Hardener HW 2951	Araldite® AW 2101 / Hardener HW 2951	EP	6		Rigid Low shrinkage	grey	thixotropic	5	5 500	1	20	100	•	:	100 : 100 100 : 100					
Araldite® F 310 / Hardener K 100-1 RED		MMA	10		Medium open time Good thermal stability	red	20	8	2 000	2	24	100	•	:	100 : 11 100 : 10					
Araldite® AW 4819 / Hardener XD 4444	Araldite® 2010-1	EP	10		Toughened Good chemical resistance	yellow	80	2	2 300	4	18	100	•	•	100 : 100 100 : 100					
Araldite® F 347 / Hardener K 100-1 RED	Araldite® 2047-1	MMA	10		Bonds difficult metals Flexible	brown	70	3	850	30	18	100	•	•	100 : 11 100 : 10					
Araldite® F 362-1 / Hardener F 362-1	Araldite® 2022-1	MMA	10	12	Non-sagging Toughened	yellow	thixotropic	3	1 700	5	25	100	:	•	100 : 100 100 : 100					
Araldite® F 348 / Hardener F 348-1	Araldite® 2048-1	MMA	10	35	Flexible Gap filling	black	thixotropic	8	350	90	24	100	•	•	100:11 100:10					

 $<sup>^{\</sup>star}$  measured following ISO 527 (Curing 16h at 40°C)  $\,$  I  $\,$   $^{\star\star}$  measured following ISO 4587 (Curing 16h at 40°C)

Cure temperature at RT possible (full cure achieved after 7 days)

SUITABILITY: EXCELLENT | GOOD | MODER

EXCELLENT | G

 $<sup>^{\</sup>star\star\star}$  maximum temperature giving LSS > 5 MPa or maximum temperature giving 33% of LSS at 23°C

# Reliable and comprehensive bonding solutions



# Medium pot life - from 15 to 40 minutes

Product designation		Techno- logy	Pot life	Fixture time	Key benefits	Color	Viscosity	Gap filling capability	g E- / modulus*	Elongation at break*	Lap shear strength on aluminum**	service tempera-	to water /	to	Mix ratio - by weight - by volume	Metals		Thermosets Thermo- composites plastics		Various substrates	
																Mild steel Stainless steel Galvanized steel Aluminium Copper	GRP (UP) GRP (EP) CFRP	SMC PVC PA	ABS, ASA, SAN PC PMMA	Ceramic Glass Rubber Wood	
Conditions			100g at 23°C			mixed															
Unit			min	min			Pa·s	mm	MPa	%	MPa	°C									
Bulk	Cartridge																				
Araldite® F 252 / Hardener K 100-1 RED	Araldite® 2052-1	MMA	15	20	Temperature resistant Toughened	red	80	3	1 700	10	24	140	:	•	100 : 12 100 : 10				ı		
Araldite® AV 138 M-1 / Hardener HV 998-1		EP	30	240	Temperature resistant Resistant to chemicals	grey	thixotropic	5	4 200	1	15	140	:	•	100 : 40 100 : 40		ш			Ш	
Araldite® AY 4446 / Hardener HY 4445	Araldite® 2018	PUR	40	240	UV Stable Flexible	opaque	8	1	15	45	7	80	•	•	100 : 95 100 : 100					П	
Araldite® AW 4752 / Hardener HW 4753		EP	40	420	Suitable for filter bonding Resistant to chemicals	dark grey	25	1	5 500	1	16	110	•	•	100 : 48 100 : 50		П				
Araldite® AW 4840-1 / Hardener HW 4841	Araldite® 2029-1	PUR	40	240	High elongation at break High strength	dark grey	60	5	550	40	24	80	•	•	100 : 82 100 : 100						
Araldite® AV 5308 / Hardener HV 5309-2	Araldite® 2015-1	EP	50	240	Toughened GL approved Resistant to weathering	beige	thixotropic	10	1 600	4	20	100	:	•	100 : 100 100 : 100						

 $<sup>^{\</sup>star}$  measured following ISO 527 (Curing 16h at 40°C)  $\,$  I  $\,$   $^{\star\star}$  measured following ISO 4587 (Curing 16h at 40°C  $\,$ 

Cure temperature at RT possible (full cure achieved after 7 days)

 $<sup>^{\</sup>star\star\star\star}$  maximum temperature giving LSS > 5MPa or maximum temperature giving 33% of LSS at 23°C



# Long pot life - from 45 to 70 minutes

Product designation		Techno- logy	Pot life	Fixture time	Key benefits	Color	Viscosity	Gap filling capability	E- modulus*	Elongation at break*	Lap shear strength on aluminum**	Maximum service tempera-ture***	Resistance to water / humidity	Resistance to chemicals	Mix ratio - by weight - by volume	Metals	Thermosets composites	Thermo- plastics	Various substrates
																Mild steel Stainless steel Galvanized steel Aluminium Copper Brass	GRP (UP) GRP (EP) CFRP SMC	PVC PA ABS, ASA, SAN PC PMMA	Ceramic Glass Rubber Wood
Conditions			100g at 23°C			mixed													
Unit			min	min			Pa·s	mm	MPa	%	MPa	°C							
Bulk	Cartridge																		
XW 396 / XW 397	Araldite® 2020 (working pack)	EP	45	960	Very low viscosity Suitable for clear casting	transparent	0,15	<1	2 800	4	16	60	:	:	100:30 100:35				
Araldite® AY 105-1 / Hardener HY 991		EP	45	360	Self levelling Resistant to weathering and temperature	brown	15	1	1 600	1	14	120	:	:	100:50 100 : 60				
Araldite® AV 4738 / Hardener HV 4739		EP	45	180	Resistant to temperature KIWA approved / contact with drinking water	grey	thixotropic	5	3 000	1.5	16	150	:	•	100 : 25 100 : 22				
Araldite® F 349 / Hardener paste or powder		MMA	50	90	Resistant to acids Adhesion on thermoplastics	brown	15	1	2 300	2	25	120	•	:	100:3 n.a.				
Araldite® AW 136 H / Hardener HY 991		EP	60	480	Self levelling Resistant to weathering and chemicals	grey	25	1	3 000	2	13	110	•	•	100:35 100:45				
Araldite® AW 136 H / Hardener HV 997-1		EP	70	300	Good adhesion on rubbers	grey	thixotropic	3	1 000	3	18	80	•	:	100 : 60 100 : 80				
Araldite® AV 4076-1 / Hardener HV 5309-2		EP	60	240	Toughened Resistant to weathering	neutral	thixotropic	10	1 000	5	24	100	:	:	100 : 116 100 : 100				
Araldite® AV 4076-1 BK / Hardener HV 5310 BK	Araldite® 2031-1	EP	60	180	Toughened Resistant to weathering	black	thixotropic	10	1 000	10	22	100	:	:	100 : 120 100 : 100				
Araldite® AV 4076-1 / Hardener HY 4076		EP	60	360	Toughened High peel strength	neutral	thixotropic	10	1 500	5	29	70	•	•	100 : 44 100 : 50				
Araldite® AW 5047-1 / Hardener HW 5067-1		EP	80	270	Self-levelling Temperature resistant	white	16	0,5	2 600	7	20	140	:	:	100 : 30 100 : 45				
Araldite® AV 144-2 / Hardener HV 997-1	Araldite® 2013-1	EP	80	300	Non sagging paste Multipurpose	grey	thixotropic	5	1 400	2	20	70	:	:	100 : 60 100 : 100				

 $<sup>^{\</sup>star}$  measured following ISO 527 (Curing 16h at 40°C)  $\,$  I  $\,$   $^{\star\star}$  measured following ISO 4587 (Curing 16h at 40°C)

Cure temperature at RT possible (full cure achieved after 7 days) except Araldite® 4738 / Hardener HV 4739 at minimum 80°C and Araldite® AW 5047-1 / Hardener HW 5067 at minimum 40°C

Suitability: Excellent | Good | Moderate

• • •

Excellent | Good

 $<sup>^{\</sup>star\star\star}$  maximum temperature giving LSS > 5MPa or maximum temperature giving 33% of LSS at 23°C



# Very long pot life - more than 90 minutes

Product designation	Product designation		Pot life	Fixture time	Key benefits	Color	Viscosity	Gap filling capability	E- modulus*	Elongation at break*	Lap shear strength on aluminum**	Maximum service tempera-ture***	Resistance to water / humidity	Resistance to chemicals	Mix ratio - by weight - by volume	Metals	Thermosets composites	Thermo- plastics	Various substrates
																Mild steel Stainless steel Galvanized steel Aluminium Copper Brass	GRP (UP) GRP (EP) CFRP SMC	PVC PA ABS, ASA, SAN PC PMMA	Ceramic Glass Rubber Wood
Conditions			100g at 23°C			mixed													
Unit			min	min			Pa·s	mm	MPa	%	MPa	°C							
Bulk	Cartridge																		
Araldite® AY 103-1 / Hardener HY 991		EP	90	720	Self-levelling Multi purpose	yellow	5	0.5	1000	5	15	90	:	•	100 : 40 100 : 50				
Araldite® AW 136 H / Hardener HW 5067-1		EP	100	300	High temperature resistance Resistant to chemicals	grey	10	0.5	2 800	2	15	110	•	•	100 : 29 100 : 38		ш		
Araldite® AW 4510 / Hardener HW 4511-1	Araldite® AV 4415 / Hardener HV 4416-1	EP	90	420	Resistant to high temperature Resistant to chemicals	grey	thixotropic	10	4 500	1	22	180	•	•	100 : 50 100 : 50				
XB 5090-1 / Arathane® HY 5611-1		PUR	100	360	Easy to spread Long pot life	beige	4	<1	27	40	20	60	:	:	100 : 20 100 : 25		ш		
Araldite® AW 106 / Hardener HV 953 U	Araldite® 2011	EP	100	420	Multipurpose Resistant to dynamic loading	pale yellow	40	1	1 900	9	26	90	•	:	100 : 80 100 : 100			ш	
Araldite® AW 4859 / Hardener HW 4859	Araldite® AW 4859 / Hardener HW 4859	EP	100	270	Resistant to high temperature High toughness	black	thixotropic	10	1 500	5	33	140	•	:	100 : 43 100 : 50				
Araldite® AW 139-1 / Hardener HW 5323-1	Araldite® 2014-2	EP	110	300	Resistant to temperature KIWA approved / contact with drinking water	dark grey	thixotropic	5	3 000	1	17	140	•	:	100 : 50 100 : 50		ш		ш
Araldite® AW 4833 / Hardener HW 4833	Araldite® 2033	EP	140	240	Flame retardant Long pot life	black	thixotropic	5	2 500	1	16	100	•	:	100 : 88 100 : 100				
Araldite® 420 A/B	Araldite® 420 A/B	EP	150	360	High peel strength Toughened	dark green	40	<1	1 500	10	40	60	:	:	100 : 40 100 : 50				
Araldite® AW 4858 / Hardener HW 4858	Araldite® AW 4858 / Hardener HW 4858	EP	150	360	High peel strength High toughness	black	thixotropic	10	1 600	10	38	90	:	:	100 : 42 100 : 50				
Araldite® AW 4804 / Hardener HW 4804		EP	240	na.	Resistant to very high temperatures	grey	17	0.5	6 200	1	21	220	:	:	100 : 15 100 : 28				

 $<sup>^{\</sup>star}$  measured following ISO 527 (Curing 16h at 40°C)  $\,$  I  $\,$   $^{\star\star}$  measured following ISO 4587 (Curing 16h at 40°C)

Cure temperature at RT possible (full cure achieved after 7 days) except Araldite® AW 4510 / Hardener HW 4511 at minimum 80°C and Araldite® AW 4804 / Hardener HW 4804 at minimum 120°C

Suitability: Excellent | Good | Moderate

Excellent | Good

<sup>\*\*\*</sup> maximum temperature giving LSS > 5MPa or maximum temperature giving 33% of LSS at 23°C



# No-mix and 1 component adhesive

Product designation	Product designation		Pot life	Fixture Key benefits time				Gap filling capability		Elongation Lap shear strength on aluminum**		Maximum service tempera-ture***	service to water / tempera- humidity		Mix ratio - by weight - by volume				Thermosets composites plastics			Various substrates
																Mild steel Stainless steel Galvanized steel Aluminium	Copper Brass	GRP (UP)	CFRP	PVC PA ABS, ASA, SAN	PC PMMA	Glass Rubber Wood
Conditions			100g at 23°C			mixed																
Unit			min	min			Pa⋅s	mm	MPa	%	MPa	°C										
Bulk	Cartridge																					
Araldite® F 300 / Hardener lacquer		MMA	n.a.	3	Very fast handling strength High strength and toughness	reddish brown	25	0.4	2300	7	23	100	•	•	n.a. n.a.							
Agomet® F 300 AB / Hardener powder or paste		MMA	n.a.	3	Very fast handling strength High strength and toughness	reddish brown	25	2	2 300	7	23	100	:	•	100 : 100 : 6 n.a.							
Araldite® F 305 / Hardener lacquer 2		MMA	n.a.	5	Low viscosity High strength	brown	4	0.4	1 000	20	24	90	:	•	n.a. n.a.							
Agomet® F 305 AB / Hardener powder or paste		MMA	n.a.	5	Low viscosity High strength	brown	4	< 1	500	20	24	90	:	•	100 : 100 : 6 n.a.							
Araldite® F 365A / Agomet® F 305B / Hardener powder		MMA	n.a.	5	For difficult metals High strength	brown	4	< 1	500	30	24	90	:	•	100 : 100 : 6 n.a.							
Agomet® F 307 AB / Hardener powder or paste		MMA	n.a.	8	Rigid adhesive Low shrinkage	beige	400	2	500	2	23	100	:	•	100 : 100 : 6 n.a.							
Araldite® F 347 / Hardener lacquer 2		MMA	n.a.	15	Bonds difficult metals Flexible	brown	70	0.4	850	30	14	100	•	•	n.a. n.a.							
Araldite® F 310 / Hardener lacquer 2		MMA	n.a.	18	Medium open time Good thermal stability	brown	20	0.4	2 000	2	24	100	•	•	n.a. n.a.							
Agomet® F 330 / Hardener lacquer 2		MMA	n.a.	20	Resistant to high temperature Toughened adhesive	beige	20	0.4	1 500	5	35	140	•	•	n.a. n.a.							
Araldite® F 252 / Hardener lacquer 2		MMA	n.a.	20	Temperature resistant Toughened	red	80	0.4	1 100	4	15	140	:	:	n.a. n.a.							
Araldite® AV 170		EP	n.a.	n.a.	High peel strength High toughness	off-withe	thixotropic	0.5	1 600	1	28	160	:	:	n.a. n.a.							
Araldite® AV 4600		EP	n.a.	n.a.	Outstanding peel strength High temperature resistance	orange	thixotropic	3	4000	5	40	160	•	•	n.a. n.a.			П				

 $^{\star\star\star}$  maximum temperature giving LSS > 5MPa or maximum temperature giving 33% of LSS at 23°C

Cure temperature at RT possible (full cure achieved after 7 days) except Araldite® AV 170 at minimum 140°C and Araldite® AV 4600 at minimum 150°C



# 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.

regulations. Protection of the environment, as well as health and safety are paramount concerns, playing an integral part in our development projects.

# We track both new market expectations and changing



## 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



# Find the right adhesive to fulfill your needs



www.AralditeAdhesives.com

# HUNTSMAN

## Enriching lives through innovation

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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 in direct 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.

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