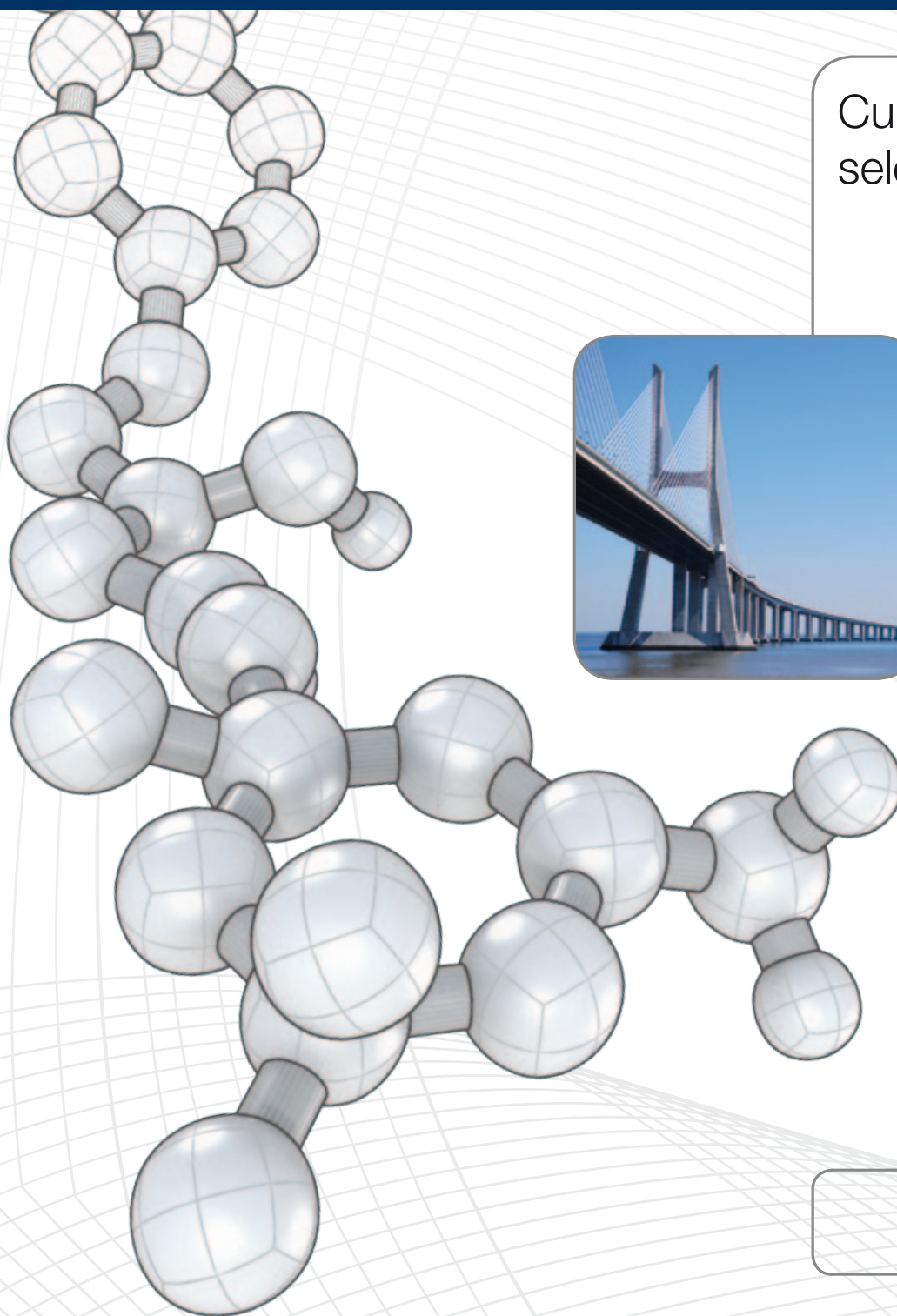


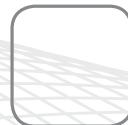


Advanced Materials

Build your properties



Curing agents selector guide





Rely on
us with
confidence



Aradur®

The original brand
serving worldwide coatings and
construction industries for more
than half a century.

Registered for
REACH

Rely on us with confidence

For more than 60 years Huntsman Advanced Materials, as a global partner and innovator produces and develops knowledgebased specialty components for high-end-performance industrial products. Its unique portfolio including a broad range of epoxy resins and reactive diluents, hardeners, crosslinkers and matting agents appeals to formulators, chemists and scientists working in challenging markets who want to be at the forefront of innovation and product development in area such as:

Coatings for metallic and mineral substrates

Primers, undercoats, topcoats, heavy-duty corrosion protection, powder coatings, potable water and food industry coatings, waterborne coatings, chemical resistant coatings

Building protection

Sealers, flexible and elastic coatings, mortars, injection resins, industrial flooring, chemical anchoring

We value your challenge with more than just products

Our know-how and expertise allow us to answer your specific formulation requirements. Huntsman Advanced Materials has a worldwide team of experts

- > to modify or develop when needed high performance products
- > to improve the quality, the durability and the performance of your products such as mechanical, temperature, fire, chemical or corrosion resistance and more to help you in process optimization and to quickly bring your product to market.

We offer product consistency through multi-scale synthesis and mixing / blending capabilities.

All the components of the products contained in this brochure have been preregistered under REACH.



Curing agents

Polyamine

Product designation	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time*	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 10	Polyamine	1 300 - 1 900	890 - 950	~ 40	12	≤ 8	CE, IM, MC	○
Aradur® 15-1	Polyamine	100 - 300	170 - 230	140	18	≤ 5	CE, IM, MC	○
Aradur® 21	Aliphatic polyamine	< 10	680 - 720	40	51	≤ 1	CE, IM, MC	○
Aradur® 42	Cycloaliphatic polyamine	10 - 20	645 - 665	42	95	≤ 1	CE, IM, MC	○
Aradur® 43-1	Cycloaliphatic polyamine	200 - 400	260 - 280	115	44	≤ 1	CE, IM	
Aradur® 43-1S	Accelerated cycloaliphatic polyamine	500 - 800	265 - 285	115	19	≤ 1	CE, IM	
Aradur® 46-1	Polyamine adduct	130 - 230	310 - 340	95	38	≤ 3	CE, IM	
Aradur® 46-1S	Cycloaliphatic polyamine	220 - 320	310 - 340	95	25	≤ 3	CE, IM, MC	
Aradur® 49	Polyamine adduct	220 - 300	280 - 360	95	24	≤ 4	CE, IM, MC	
Aradur® 51	Polyamine	20 - 40	440 - 480	67 - 90	20	≤ 3	CE	
Aradur® 53S	Polyamine adduct	300 - 400	250 - 280	~ 115	14	≤ 1	CE, IM	
Aradur® 70	Polyetherurethane amine	16 000 - 27 000	65 - 75	~ 900	300 - 500	≤ 5	CE	○
Aradur® 90	Polymercaptane	10 000 - 16 000	-	200	4 - 5 (20 g)	≤ 3	CE, IM, A	○
Aradur® 835	Solid isolated aliphatic polyamine adduct	600 - 1 200 ¹	180 - 210	~ 200	1 000 ²	≤ 6.5	IM, MC	○
Aradur® 847	Cycloaliphatic polyamine	150 - 300	350 - 375	~ 75	30	≤ 2	CE, IM, MC	
Aradur® 1012	Aliphatic polyamine	90 - 120	670 - 785	~ 66	133	≤ 4	CE	○
Aradur® 2862	Cycloaliphatic polyamide	210 - 310	255 - 270	111	25	≤ 4	CE, IM, MC	
Aradur® 2963-1	Cycloaliphatic polyamide	30 - 70	325 - 350	85	40	≤ 2	CE, IM, MC	

¹ 30% in xylene/butanol (1:1)

² With solid epoxy resin and solvent

* Gel time has been measured with Araldite® GY 250

Product designation	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time*	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 2965	Cycloaliphatic polyamine	100 - 300	300 - 325	~ 94	25	≤ 4	CE, IM, MC	
Aradur® 2973	Aliphatic polyamine	900 - 1400	300 - 335	~ 85	40	≤ 7	CE, IM	
Aradur® 2992	Aliphatic polyamine	10 - 20	575 - 605	~ 55	5	≤ 2	CE	○
Aradur® 3243	Cycloaliphatic polyamine	220 - 360	280 - 360	95	60	≤ 1	CE, IM	
Aradur® 3253	Cycloaliphatic polyamine	200 - 260	290 - 320	~ 95	40	≤ 1	CE	
Aradur® 3275	Formulated polyetherpolyamine	200 - 300	100 - 170	250	85	≤ 6	CE, IM	○
Aradur® 3277	Formulated polyamine adduct	250 - 450	450 - 500	91	80	≤ 6	CE	○
Aradur® 3290	Polyamine adduct	100 - 180	820 - 900	48	22	≤ 4	CE	
Aradur® 3296	Polyamine	350 - 650	330 - 370	75	~ 17	≤ 8	CE, IM, MC	
Aradur® 3484	Polyamine adduct	300 - 550	350 - 450	95	30	≤ 6	CE	
Aradur® 3740	Cycloaliphatic polyamine	5 - 20	645 - 700	41	58	≤ 3	CE	○
Aradur® 3741	Cycloaliphatic polyamine	1 - 15	695 - 730	39	84	≤ 1	CE	○
Aradur® 30 XWM 55	Isolated amine adduct in xylene/n-butanol/methoxypropanol (4:1:4)	2 000 - 2 800	98 - 114	~ 370	> 1 000 ²	≤ 5	IM, MC	○
Aradur® 3776 XW 55	Isolated amine adduct in xylene/n-butanol	1 500 - 2 500	100 - 120	350	> 1 000 ²	≤ 8	IM, MC	○
Aradur® 20250	Accelerated polyamine	130 - 210	1 010 - 1 170	30	18	≤ 6	CE	○
Aradur® 20315	Formulated polyamine adduct	5 500 - 8 000	470 - 510	59	~ 100	-	CE, IM, MC	○
Aradur® 20315 S	Formulated polyamine adduct	3 000 - 5 000	455 - 515	61	~ 40	≤ 9	CE, IM, MC	○
Aradur® 20317	Formulated polyamine adduct	2 500 - 6 000	410 - 510	~ 65	65	≤ 0.5	CE	○
Aradur® 33641	Formulated fast cure amine	4 000 - 8 000	450 - 550	58	~ 10	≤ 8	CE, IM, MC	○

² With solid epoxy resin and solvent

* Gel time has been measured with Araldite® GY 250

Phenalkamine

Product	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time*	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 3440	Phenalkamine	1 000 - 3 000	490 - 550	~ 80	35	≤ 17	IM, MC	○
Aradur® 3441	Phenalkamine	10 000 - 35 000	292 - 325	~130	60	≤ 17	IM, MC	○
Aradur® 3442	Phenalkamine	1 000 - 5 000	320 - 345	~ 125	35	≤ 17	IM, MC	○
Aradur® 3467 XW 70	Phenalkamine adduct	1 000 - 3 000	170 - 210	180 - 220	120 ²	≤ 18	IM, MC	○
Aradur® 3460	Phenalkamine	2 000 - 5 000	305 - 335	120	95	≤ 17	CE, IM, MC	○
Aradur® 3462	Phenalkamine	750 - 2 500	395 - 443	100	70	≤ 19	CE, IM, MC	○

Waterborne

Waterborne curing agents

Product	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time ¹	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 35-1	Polyamine adduct in water	19 000 - 35 000	100 - 120	~ 380	~ 70	≤ 6		○
Aradur® 36	Polyamine adduct 79-81% in water	4 000 - 7 000	185 - 225	~ 165	~ 150	≤ 6	CE, IM, MC	○
Aradur® 38-1	Polyamine adduct 79-81% in water	12 000 - 20 000	170 - 210	~ 150	~ 75	≤ 6	CE, IM, MC	○
Aradur® 39	Polyamine adduct 49-51% in water	12 000 - 20 000	120 - 140	~ 335	120 - 240	≤ 5	CE, IM, MC	○
Aradur® 340	Polyamidoamine adduct 49-51% in water	18 000 - 23 000	155 - 175	~ 210	120 - 180	≤ 12	CE, IM, MC	○
Aradur® 435	Polyamidoamine adduct 49-51% in water	13 000 - 23 000	160 - 200	~ 250	90 - 120	≤ 10	CE, IM, MC	○

Continued on next page

¹ Gel time for waterborne hardeners has been measured with Araldite® GY 776

² With solid epoxy resin and solvent

* Gel time has been measured with Araldite® GY 250

Continued

Product	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time ¹	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 3985	Polyamine adduct 54-56% in water	1 000 - 6 000	170 - 210	~ 265	60	≤ 6	CE, IM, MC	○
Aradur® 3986	Polyamine adduct 39-41% in water	15 000 - 35 000	90 - 110	~ 415	180	≤ 6	IM, MC	○
Aradur® 3987	Polyamine adduct dissolved in water	15 000 - 30 000	200 - 250	~ 147	60	≤ 8	CE, IM, MC	○

Accelerators

Product	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Accelerator 960-1	Tertiary amine	120 - 250	560 - 675	~ 20	n/a	≤ 8	CE, IM, MC	○
Accelerator 2950	Co-reacting	2 000 - 6 000	640 - 700	~ 75	n/a	≤ 10	CE, IM, MC	○
Accelerator 3130	40 % in ethanol	10 - 100	not an amine	-	n/a	-	CE, IM, MC	○

Polyamidoamine curing agents

Polyamidoamine

Product	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time*	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 115	Polyamidoamine	3 100 - 3 700 at 75°C	240 - 260	240	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 125	Polyamidoamine	700 - 900 at 75°C	340 - 370	130	120	≤ 10	CE, IM, MC, A	○
Aradur® 140	Polyaminoimidazoline	300 - 600 at 75°C	370 - 410	95	120	≤ 10	CE, IM, MC, A	○
Aradur® 145	Polyaminoimidazoline	2 400 - 4 000	380 - 420	95	180	≤ 10	CE, IM, MC, A	○

Continued on page 8

¹ Gel time for waterborne hardeners has been measured with Araldite® GY 776

² With solid epoxy resin and solvent

* Gel time has been measured with Araldite® GY 250

Continued

Product	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time*	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 223	Polyamidoamine	80 - 180	325 - 355	115 - 130	300	≤ 6	CE, IM, MC	
Aradur® 224	Polyaminoimidazoline	4 000 - 7 000	260 - 320	180	> 480	≤ 10	IM, A	○
Aradur® 250	Polyamidoamine	400 - 700	425 - 455	95	60	≤ 8	CE, A	○
Aradur® 350	Polyaminoimidazoline	100 - 400	370 - 410	95	180	≤ 10	CE, A	○
Aradur® 370	Polyaminoimidazoline	150 - 350	480 - 520	95	70	≤ 10	CE, A	○
Aradur® 450	Polyamidoamine adduct	700 - 2 000	250 - 290	115	78	≤ 10	CE, IM, MC	
Aradur® 450-1S	Polyamidoamine adduct	450 - 1300	280 - 320	115	50	≤ 10	CE, IM, MC	
Aradur® 3282-1	Formulated polyamidoamine adduct	900 - 1900	290 - 350	115	100	≤ 10	CE, IM	○
Aradur® 848	Polyamidoamine	2 500 - 5 500	200 - 230	135 - 190	95	≤ 10	CE, IM, MC	
Aradur® 891	Formulated polyamidoamine	130 - 190	520 - 550	74 - 82	~100	≤ 10	CE	○
Aradur® 33225	Polyamidoimidazoline	100 - 400	240 - 310	75 - 115	15	≤ 12	CE, IM	○

Polyamidoamine solutions

Product	Characteristics	Viscosity 25°C	Amine value	H+ active equiv.	Gel time*	Color	Applications	BzOH Free
Unit / scale		mPa·s	mg KOH/g	g/Eq	min	Gardner		
Aradur® 100 PP 77.5	Polyamidoamine in n-propanol	10 000 - 17 000	64 - 72	~ 610	> 1 000 ²	≤ 9	IM, MC	○
Aradur® 100 X 60	Polyamidoamine in xylene	2 100 - 3 500	49 - 57	~ 790	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 100 XM 60	Polyamidoamine in xylene/methoxypropanol (4:1)	2 200 - 3 900	50 - 56	~ 790	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 115 X 70	Polyamidoamine in xylene	750 - 1250	168 - 182	~ 340	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 125 X 70	Polyamidoamine in xylene	200 - 600	235 - 265	~ 185	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 422 XW 70	Polyamidoamine adduct in xylene/n-butanol (3:2)	6 000 - 12 000	140 - 170	~ 340	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 423 XW 60	Polyamidoamine adduct in xylene/n-butanol (4:1)	800 - 1400	122 - 138	~ 520	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 424 XW 50	Polyamidoamine adduct in xylene/n-butanol (4:1)	600 - 2400	80 - 110	~ 785	> 1 000 ²	≤ 10	IM, MC	○
Aradur® 460 J 90	Polyamidoamine adduct in ethanol	1 800 - 5 500	240 - 270	~ 190	100	≤ 10	CE, IM, MC	○
Aradur® 20115 I 73	Polyamidoamine in 2-propanol	1 400 - 3 200	165 - 185	~ 330	> 1 000 ²	≤ 12	IM, MC	○

² With solid epoxy resin and solvent

* Gel time has been measured with Araldite® GY 250

Nomenclature

Curing agents

Huntsman Advanced Materials' registered trademark for commercial hardeners is Aradur®.

Example: **Aradur® 3467 XW 70** and **Aradur® 46-1 S**

In case of hardeners the characteristic number for the product name follows directly after the registered trademark.

Example: Aradur® **3467** XW 70

A one- up to three-letter code behind the characteristic product number indicates a solvent (mixture).

Example: Aradur® 3467 **XW** 70

This solvent code is followed by a number indicating the solid content of the product (in the example above it's 70% hardener dissolved in a xylene/butanol mixture).
Example: Aradur® 3467 XW **70**

A one-letter code (S) behind the characteristic product number (without additional solid-content number) indicates a special behavior of the hardener. S shows that the hardener is the fast version of an existing product.

Legend

Applications legend

- A** Automotive
- CC** Can & Coil
- CE** Civil Engineering
- IM** Industrial Maintenance
- PC** Powder Coatings
- MC** Marine Coatings

REACH

Registered for
REACH

All the components of the products contained in this brochure have been pre-registered under REACH.

All products mentioned in this publication are:

- > **Nonyl phenol-free**
- > **Phenol-free**
- > **Tert-butyl phenol-free**
- > **Bisphenol-A-free** ¹
- > **Bisphenol-F-free** ¹

Those products marked "o" in the column «BzOH Free» are free from benzyl alcohol.

¹ Certain products may contain trace amounts where adducted with BPA or BPF epoxy resins.

Gel times

The values under «Gel time» have been measured using TECAM, 250g/23°C with Araldite® GY 250 unless otherwise specified. (n.m. = not measured).

Safety and handling precautions

The Material Safety Data Sheet (MSDS) should be consulted prior to handling any of here listed products.

Product range

Additional products are available upon request.



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 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.

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

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 development and quality
- > product trials in-house and with customers
- > customer seminars and training
- > trouble-shooting and problem-solving

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.





We value
your
challenge



Huntsman Advanced Materials

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

Our capabilities in high-performance adhesives and composites, delivered by more than 2300 associates, serve over 3000 global customers with innovative, tailor-made solutions and more than 1500 products which address global engineering challenges.

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The Product may be or become hazardous. Buyer should (i) obtain 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 indirect 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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Ref. No. AdMat Ambient curing selector guide 03.13_EN_EU



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