



D.E.H.™ 800

Epoxy Curing Agent

D.E.H.™ 800 Epoxy Curing Agent is a polyamine adduct water-based curing agent designed to be used with liquid Bisphenol A and/or Bisphenol F epoxy resins for low temperature applications. It provides superior performance for general civil engineering applications. D.E.H.™ 800 is supplied at 50% solids in water.

- Hardener for epoxy resins and resin emulsions
- Contains no organic solvents
- Polyamine adduct curing agent dissolved in water
- Fast drying
- Mixes easily with water and epoxy resin
- Easy to clean-up

Typical

This product is suitable for use in applications such as:

- Coatings of concrete substrates
- Epoxy Mortars
- Applications where low odor and low emissions are critical

Typical

Property ⁽¹⁾	Method	Value
Appearance	Visual	yellow
Color, Gardner		8 max.
Viscosity @ 25°C (mPa·s)	ASTM D4287	7500 ± 2500
Amine value [mgKOH/g]	ISO 9702	170 ± 20
Amine Hydrogen Equivalent Weight	calculated	300
Shelf Life (Months)		6

(1) Typical properties, not to be construed as specifications.

Typical Handling

Property	Method	Value	
		D.E.R.™ 324	D.E.R. 353
		D.E.H. 800	D.E.H. 800
Dry time (hrs)	ASTM D1640-03		
Tack free		4	4
Dry Through		7	6.5
Gel Time (min/100 g mass @25°C) ²		109	114
Mix ratio, phr (weight)		151	154

⁽²⁾ Tested by Paul N. Gardner Standard Model Gel Timer



D.E.H.TM 802

Epoxy Curing Agent

Description

D.E.H.TM 802 Epoxy Curing Agent is a polyamine adduct waterborne curing agent with optimized rheology specially designed to provide superior performance in roller applications. It can be used with liquid Bisphenol A and/or Bisphenol F epoxy resins. It is supplied at 50 % solids in water.

Advantages

- Hardener for epoxy resins and resin emulsions
- Contains no organic solvents
- Polyamine adduct curing agent dissolved in water

Typical Applications

This product is suitable for use in applications such as:

- Impregnation of concrete
- Concrete Flooring
- Self-Leveling Flooring
- Epoxy mortars
- Protective coatings for steel

Typical Properties

Property ⁽¹⁾	Method	Value
Appearance	Visual	yellow
Color, Gardner		< 8
Density @ 25°C (g/ml)	ASTM D4052	1.09
Viscosity @ 25°C (mPa·s)	ASTM D445	5000
Amine value [mgKOH/g]	ISO 9702	170
Amine Hydrogen Equivalent Weight	Calculated	300
Shelf Life (Months)		6

(1) Typical properties, not to be construed as specifications.

Typical Handling Properties

Property	Method	Value
		D.E.R. TM 324
		D.E.H. 802
Gel Time (min/100 g mass @25°C) ²		109
Mix ratio, phr (weight)		150

(2) Tested by Paul N. Gardner Standard Model Gel Timer

Typical Performance Properties³

Property ⁽³⁾	Method	Value
		D.E.R.™ 324
		D.E.H. 802
Mix ratio, phr (weight)		150
Film appearance	Visual	Semi -glossy
Blushing		
@ 25°C/50% relative humidity		No
@ 25°C/95% relative humidity		No

⁽³⁾ Unless otherwise specified, properties obtained after more than 7 days cure at ambient temperature

Safety and Handling

The Dow Chemical Company provides its customers with a product specific Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) to cover potential health effects, safe handling, storage, use and disposal information. Dow strongly encourages its customers to review the MSDS or SDS on its products and other materials prior to their use.

This curing agent should retain its chemical properties for a period of at least 6 months.

For further handling information, consult the Dow brochure entitled, *DOW Epoxy Curing Agents Product Stewardship Manual, Safe Handling and Storage*, Form No. 296-01331 and the Dow technical bulletin, *Product Coding, Shelf-life and Storage Stability*, Form No. 296-01657.

Product Stewardship

The Dow Chemical Company has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis of our Product Stewardship philosophy by which we assess the health and environmental information on our products and then take the appropriate steps to protect employee and public health and the environment. The Dow Chemical Company has enduring commitments to Responsible Care® in the management of chemicals worldwide. Our Product Stewardship program rests with every individual involved with Dow products from the initial concept and research to the manufacture, sale, distribution, and disposal of each product.



D.E.H.™ 804 Epoxy Curing Agent

Description D.E.H.™ 804 is a waterborne epoxy curing agent.

Benefits D.E.H.™ 804 is an amine curing agent dissolved in water and designed to emulsify epoxy resins. It is formulated without any benzyl alcohol or other Volatile Organic Compounds (VOC) according to the European Directive 2004/42/EC and does not contain any alkyl phenol. When cured with D.E.R.™ 3221 above a D.E.H. 805 based primer, D.E.H. 804 did not contribute to significant emissions, such that the full flooring system could pass the AgBB evaluation scheme and get labeled A+ according to the French labeling of construction products evaluation scheme (details of the emission test results can be found in the separate certificates document). D.E.H. 804 can hence serve as a curing agent for self-leveling floorings (2-3mm), meant to be applied in areas where the amount of emissions coming from construction products needs to be kept to a minimum, such as in schools, hospitals, etc.

Besides, D.E.H. 804 curing agent offers excellent water vapor permeability: flooring specimens can be formulated with D.E.H. 804 to display a low water vapor diffusion equivalent air layer thickness (Sd). Therefore D.E.H. 804 is also suitable for the development of flooring on green concrete or where water is expected to migrate from the substrate.

The end of pot-life of systems based on D.E.H. 804 is visible thanks to an increase in viscosity or a decrease in gloss.

Coatings formulated with D.E.H. 804 display a high gloss and no curling effect or deformation. It has indeed been designed to limit the amount of internal stress in the coating layer.

Note that because D.E.H. 804 is supplied as a solution in water it is sensitive to frost. However, because it is not an emulsion, in case of freezing, it can be heated and hence returned to its original state without change in quality.

Applications • Self-leveling flooring

Typical properties

	Nominal Value	(English)	Test Method
Viscosity at 25°C	5000 - 11000	mPa.s	ISO 3219
Amine value	255 - 275	mg KOH/g	ISO 9702
Amine Hydrogen Equivalent Weight (as supplied)	175	g/eq	Calculated
Solids content	69 - 71	wt. %	ATSM D2369

Notes

These are typical properties only and not to be construed as specifications. Users should confirm results by their own tests.

Typical Handling and Performance Properties

All data presented hereunder were developed using D.E.R. 3221 as an epoxy resin component.

	Nominal Value	(English)
Mixing ratio	100 : 90	
Mixing viscosity at 25°C	2250	mPa.s
Pot-life	50	minutes

Emulsion Formation

When combined with water and a suitable epoxy resin, D.E.H.™ 804 will act as a surfactant for the epoxy resin component, emulsifying the latter. To guarantee formation of a high quality emulsion, the following recommendations should be followed:

1. Combine D.E.H. 804 (pure in the case of clear coatings, or formulated with the adequate filler package for pigmented coatings) with as much water as required to bring the viscosity of the curing agent side to the same level as that of the epoxy resin component.
2. Combine the curing agent side with the epoxy resin under the adequate mixing ratio.

It is recommended to monitor at all times the temperature such as not to exceed 50°C.

Application

To ensure optimum results, it is recommended to apply formulations based on D.E.H.™ 804 under the following conditions:

- Relative humidity < 80%
- Temperature: 10-30°C

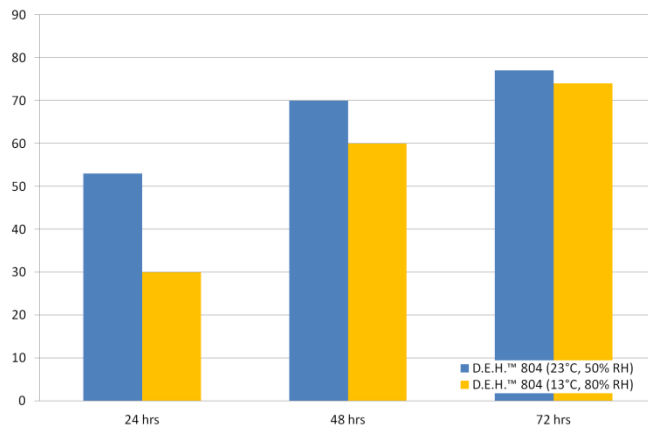
Starting formulation

The following starting formulation allows developing satin finish flooring, i.e. offering a gloss (60°) ~20. Besides flooring prepared according to the below formulation will display a water vapor permeability of less than 6 meters (inferior to the Sd value for formulations based on a competitive waterborne curing agent).

Components	Mass	
Part A		
D.E.H.™ 804	120	gr
Water	63	gr
Defoaming agent, e.g. EFKA 2526	5	gr
Pigment, e.g. Kronos 2063	29	gr
Pigment, e.g. Flammruss 101	1	gr
Barium sulphate, e.g. EWO	300	gr
Quartz (0,06 – 0,25), e.g. ISG 100	450	gr
Water	30	gr
Thixotropic agent, e.g. Deuteron VT 819 3% in water	2	gr
Part B		
D.E.R.™ 3221	140	gr

Water content	12	%wt.
Binder content	20	% wt.
Filler content	68	% wt.
PVC	56	% wt.

Shore D hardness development



Mechanical properties

Tensile strength	19.5	N/mm ²
Compressive strength	35	N/mm ²
Shrinkage	< 1	N/mm ²



D.E.H.™ 805 Epoxy Curing Agent

Description D.E.H.™ 805 is a waterborne epoxy curing agent.

Benefits D.E.H.™ 805 is an amine curing agent dissolved in water and designed to emulsify epoxy resins. It is formulated without any benzyl alcohol or other VOC's according to the Directive 2004/42/EC and does not contain any alkyl phenol. When cured with D.E.R.™ 3221 and applied as a primer under a D.E.H. 804 based top-coat, D.E.H. 805 did not contribute to significant emissions, such that the full flooring system could pass the AgBB evaluation scheme and get labeled A+ according to the French labeling of construction products evaluation scheme (the emission test results can be found in the separate certificate document). D.E.H. 805 can hence serve as a curing agent for thin layer applications (primer or top-coat), meant to be applied in areas where the amount of emissions coming from construction products needs to be kept to a minimum, such as in schools, hospitals, clean rooms etc.

When using D.E.H. 805 to develop formulations applicable with a roller, flooring presenting a matte, satin or high gloss finish can be achieved. During the time of application (before end of pot-life), films formed with D.E.H. 805 will show a constant gloss.

The end of pot-life of systems based on D.E.H. 805 is visible thanks to an increase in viscosity or a decrease in gloss of films formed thereof.

Note that because D.E.H. 805 is supplied as a solution in water it is sensitive to frost. However, because it is not an emulsion, in case of freezing, it can be heated and hence returned to its original state without change in quality.

- Applications**
- Roller coating
 - Primer

Typical properties

	Nominal Value	(English)	Test Method
Viscosity at 25°C	10000 - 18500	mPa.s	ISO 3219
Amine value	180 - 240	mg KOH/g	ISO 9702
Amine Hydrogen Equivalent Weight (as supplied)	220	g/eq	Calculated
Solids content	64 - 66	wt. %	ATSM D2369

Notes

These are typical properties only and not to be construed as specifications. Users should confirm results by their own tests.

Typical Handling and Performance Properties

All data presented hereunder were developed using D.E.R. 3221 as an epoxy resin component.

	Nominal Value	(English)
Mixing ratio	100 : 110	
Mixing viscosity at 25°C	2300	mPa.s
Pot-life	120	minutes

Emulsion Formation

When combined with water and a suitable epoxy resin, D.E.H. 805 will act as a surfactant for the epoxy resin component, emulsifying the latter. To guarantee formation of a high quality emulsion, the following recommendations should be followed:

1. Combine D.E.H. 805 (pure in the case of clear coatings, or formulated with the adequate filler package for pigmented coatings) with as much water as required to bring the viscosity of the curing agent side to the same level as that of the epoxy resin component.
2. Combine the curing agent side with the epoxy resin under the adequate mixing ratio.

It is recommended to monitor at all times the temperature such as not to exceed 50°C.

Application

To ensure optimum results, it is recommended to apply formulations based on D.E.H.™ 805 under the following conditions:

- Relative humidity < 80%
- Temperature: 10-30°C

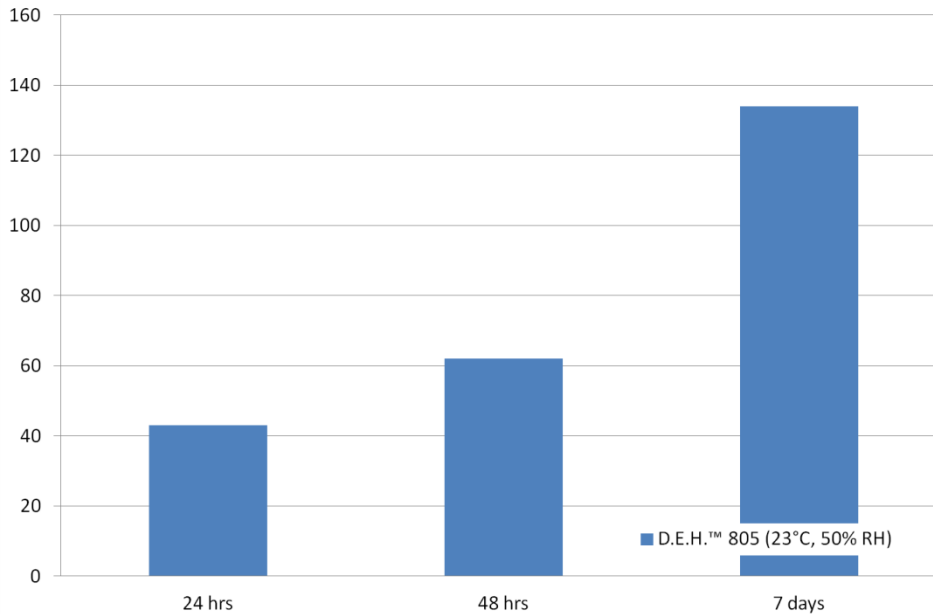
Starting formulation

The following starting formulation allows developing flooring with a satin finish, i.e. gloss (60°) ~ 65.

Components	Mass	
Part A		
D.E.H.™ 805	23	gr
Water	10	gr
Dispersing agent, e.g. Disperbyk 194	0.1	gr
Defoaming agent, e.g. Byk 024	0.2	gr
Pigment, e.g. Kronos 2063	10	gr
Pigment, e.g. Bayferrox 318M	2	gr
Barium sulphate, e.g. EWO	30	gr
Water	21.9	gr
Thixotropic agent, e.g. Tafigel PUR 61	2.8	gr
Part B		
D.E.R.™ 3221	21	gr

Water content	29.5	%wt.
Binder content	26.3	% wt.
Filler content	31	% wt.
PVC	24.2	% wt.

Koenig pendulum hardness development





D.E.H.™ 806 Epoxy Curing Agent

Description D.E.H.™ 806 Epoxy Curing Agent is a polyamine-adduct based epoxy curing agent dissolved in water and designed to emulsify epoxy resins. The product contains no VOC according to the European Directive 2004/42/EC and no alkyl phenol.

Benefits D.E.H.™ 806 is freeze stable at temperatures above -15°C. The product is recommended for the impregnation and coating of concrete substrates. D.E.R.™ 3531 and D.E.R. 3221 epoxy resins are recommended. When used in combination with a solid epoxy resin emulsion, D.E.H. 806 will show good anticorrosion properties on steel.

Dow Epoxy	Nominal Value	Unit	Test Method
AHEW	200	g/eq	
Viscosity, absolute (25°C)	9500 to 15500	mPa·s	ISO 3219
Colour (Max. Gardner)	12		ASTM D1544
Solids Content	79 to 81	%	ASTM D2369
Amine Value	185 to 235	mg KOH/g	ISO 9702
Pot Life (23°C, 100 g)	120	min	GELNORM Geltimer-TC ¹

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

¹ Reference Resin: D.E.R.™ 331

Safety Considerations

The Dow Chemical Company provides its customers with a product specific Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) to cover potential health effects, safe handling, storage, use and disposal information. Dow strongly encourages its customers to review the MSDS or SDS on its products and other materials prior to their use.

For further handling information, consult the Dow brochure entitled, DOW Epoxy Curing Agents Product Stewardship Manual, Safe Handling and Storage, Form No. 296-01331 and the Dow technical bulletin, Product Coding, Shelf-life and Storage Stability, Form No. 296-01657.



D.E.H.™ 810 Epoxy Curing Agent

Description D.E.H.™ 810 Epoxy Curing Agent is a polyamine-adduct based epoxy curing agent dissolved in water and designed to emulsify epoxy resins. The product contains no VOC according to the European Directive 2004/42/EC and no alkyl phenol.

Benefits D.E.H.™ 810 provides low viscous epoxy systems with a long and a visible end of potlife. Recommended epoxy resins are D.E.R.™ 3531, D.E.R. 3221 and D.E.R. 914.

Dow Epoxy	Nominal Value	Unit	Test Method
AHEW	300	g/eq	
Viscosity, absolute (25°C)	2000 to 4000	mPa·s	ISO 3219
Colour (Max. Gardner)	10		ASTM D1544
Solids Content	49 to 51	%	ASTM D2369
Amine Value	165 to 195	mg KOH/g	ISO 9702
Pot Life (23°C, 100 g)	120	min	GELNORM Geltimer-TC ¹

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

¹ Reference Resin: D.E.R.™ 331

Safety Considerations

The Dow Chemical Company provides its customers with a product specific Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) to cover potential health effects, safe handling, storage, use and disposal information. Dow strongly encourages its customers to review the MSDS or SDS on its products and other materials prior to their use.

For further handling information, consult the Dow brochure entitled, DOW Epoxy Curing Agents Product Stewardship Manual, Safe Handling and Storage, Form No. 296-01331 and the Dow technical bulletin, Product Coding, Shelf-life and Storage Stability, Form No. 296-01657.



D.E.H.™ 813 Epoxy Curing Agent

Description D.E.H.™ 813 is a, polyamine-adduct based epoxy curing agent dissolved in water and designed to emulsify epoxy resins. The product contains no VOC according to the European Directive 2004/42/EC and no alkyl phenol.

Benefits D.E.H.™ 813 epoxy curing agent is recommended for use with solid epoxy resin dispersions for anti-corrosion coatings on steel. Formulations based on D.E.H. 813 show very short drying times, fast hardness development and have excellent chemical resistance. D.E.H. 813 is compatible with pure zinc phosphate as active anti-corrosive pigment. As a result of its high reactivity, it is suitable for applications using two-component spraying equipment.

Dow Epoxy	Nominal Value	Unit	Test Method
AHEW	200	g/eq	
Viscosity, absolute (25°C)	5000 to 10000	mPa·s	ISO 3219
Colour (Max. Gardner)	9		ASTM D1544
Amine Value	150 to 200	mg KOH/g	ISO 9702
Pot Life (23°C, 100 g)	50	min	GELNORM Geltimer-TC ¹

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

¹ Reference Resin: D.E.H. 915

Safety Considerations

The Dow Chemical Company provides its customers with a product specific Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) to cover potential health effects, safe handling, storage, use and disposal information. Dow strongly encourages its customers to review the MSDS or SDS on its products and other materials prior to their use.

For further handling information, consult the Dow brochure entitled, DOW Epoxy Curing Agents Product Stewardship Manual, Safe Handling and Storage, Form No. 296-01331 and the Dow technical bulletin, Product Coding, Shelf-life and Storage Stability, Form No. 296-01657.



D.E.H.™ 860 Epoxy Curing Agent

Description D.E.H.™ 860 Epoxy Curing Agent is a polyaminoamide-based epoxy curing agent, free of organic solvents. The product emulsifies liquid epoxy resins.

Benefits D.E.H.™ 860 is recommended for the impregnation and sealing of concrete substrates, as well as odourless water based protective and decorative coatings.

Applications

- Building & Civil Engineering
- Paint & Coatings

Dow Epoxy	Nominal Value	Unit	Test Method
AHEW	210	g/eq	
Viscosity, absolute (25°C)	25000 to 50000	mPa·s	ISO 3219
Colour (Max. Gardner)	16		ASTM D1544
Solids Content	49 to 51	%	ASTM D2369
Amine Value	160 to 210	mg KOH/g	ISO 9702
Pot Life (23°C, 100 g)	120	min	GELNORM Geltimer-TC ¹

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

¹ Reference Resin: D.E.R.™ 331

Safety Considerations

The Dow Chemical Company provides its customers with a product specific Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) to cover potential health effects, safe handling, storage, use and disposal information. Dow strongly encourages its customers to review the MSDS or SDS on its products and other materials prior to their use.

For further handling information, consult the Dow brochure entitled, DOW Epoxy Curing Agents Product Stewardship Manual, Safe Handling and Storage, Form No. 296-01331 and the Dow technical bulletin, Product Coding, Shelf-life and Storage Stability, Form No. 296-01657.