Araldite® GZ 488 N-40 Resin

Product Description

Araldite® GZ 488 N-40 is a very high molecular weight bisphenol A based epoxy polymer dissolved in primarily methyl ethyl ketone. Since film forms without the use of a hardener, it produces outstanding surface coatings by solvent evaporation. In addition, the high hydroxyl content of the resin permits co-reaction with urea-, melamine-, and phenol- formaldehyde crosslinking resins to produce excellent baking finishes. Coatings based on Araldite® GZ 488 N-40 exhibit excellent adhesion, flexibility, impact and abrasion resistance, and chemical and corrosion resistance.

Applications

- Coil coating
- Primers
- Metal decoratives
- Collapsible tubes and foil coatings
- Industrial maintenance paints
- Zinc rich coatings

Features

- Excellent flexibility
- Good toughness
- Outstanding chemical and corrosion resistance
- Excellent stability for one-component systems

Typical Properties*

Property	Value
Non-volatile content	40 ± 1%
Solvents	Methyl ethyl ketone, propylene glycol, monomethyl ether acetate, cyclohexanone
WPE	3570 minimum
Viscosity, Gardner-Holdt, @ 25°C	U - Y
Color, Gardner-Holdt, max	5 max
Density, lb/gal	8.0

*Typical properties are based on Huntsman's test methods. Copies are available upon request.

Processing

Crosslinking Resins

When used in combination with polyisocyanates (NCO), Araldite® GZ 488 N-40 allows the formulation of ambient cure coatings with high reactivity. The combination of Araldite® GZ 488 N-40 with capped isocyanates or phenolic/amino resins results in baking enamel systems which exhibit the following properties after curing at temperatures in the range of 149 - 232°C.

Reaction properties

Reacted with	NCO	PF	UF	MF
Adhesion	1 - 2	1 - 2	1	2
Flexibility and formability	2	2	1	3
Abrasion resistance	1	2	2	2
Chemical resistance	2	1	2 - 3	2 - 3
Color stability	3	3	1	1
Storage stability	2	2	1	2

1 = very good, 2 = good, 3 = moderate

The choice of the crosslinking resins for baking applications is dependent upon the performance required.

Phenolic resins (PF), for optimum chemical and abrasion resistance.
Urea-formaldehyde resins (UF), for optimum flexibility.
Melamine-formaldehyde resins (MF), for optimum color.

When Araldite® GZ 488 N-40 is used in combination with poly isocyanates, optimal properties are achieved when the ratio of OH:NCO groups is within the range of 1:1 to 1:0.8 parts by weight.

Mix Ratio OH:NCO (parts by weight)

Product	1 : 1	1 : 0.8
Araldite® GZ 488 N-40	100	100
Desmodur L,* 75%	44.6	35.7
Desmodur N,* 75%	37.4	29.9

*Bayer AG, Leverkusen, Germany

Pigmentation

Araldite® GZ 488 N-40 is neutral to all epoxy compatible pigments and may be pigmented using standard equipment.

Technical Application

Properly formulated coatings may be applied by conventional trade sales or industrial techniques.

Curing

When formulated without hardeners, Araldite® GZ 488 N-40 coatings can be air dried or, if desired, force dried. The cure schedule for coatings containing phenolic or amino resins may vary from 60 minutes at 149°C (300°F) to two minutes at 232°C (450°F). The use of an acid catalyst will shorten the bake cycle.

Formulation 1 - Strontium Chromate Primer

Product	Pounds	Gallons
Strontium chromate	22.0	0.71
Rutile titanium dioxide[1]	45.0	1.32
Magnesium silicate[2]	47.0	2.04
Diatomaceous silica[3]	28.0	1.46
Araldite® GZ 488 N-40	445.2	55.68
Methyl ethyl ketone	142.4	21.22
Methyl isobutyl ketone	42.1	6.32
Cellosolve	42.1	5.45
Xylene	42.1	5.80
Total	855.9	100.00

[1]TiPure R-960, DuPont Co. or equal
[2]Nytal 400, RT Vanderbilt Co. or equal
[3]Celite 281, Celite Div. of John-Manville Corp., or equal

Formulation 1 - Physical Properties

Property	Value
Non-volatile content,%	37.4
Pigment/binder ratio	45 / 55
Pigment volume concentration, %	26
Viscosity @ 25°C, Stormer viscometer, kreb units	60

Formulation 2 - Zinc Rich Primer

Product	Pounds	Gallons
Zinc Dust[1]	1332.4	22.65
Araldite® GZ 488 N-40	410.7	51.34
Methyl ethyl ketone	86.6	11.96
Methyl isobutyl ketone	43.3	6.49
Cellosolve	43.3	5.60
Pigment suspension agent[2]	13.3	1.96
Total	1929.6	100.00

Note: Add solvents to the resin solution, then add the zinc dust pigment with high speed agitation.
[1]Zinc Dust 22, New Jersey Zinc Co. or equal
[2]MPA-60X, Rheox Inc. or equal

Formulation 2 - Physical and Performance Properties

Property	Value
Non-volatile content,% by weight	77.7
Non-volatile content,% by volume	38.1
Pigment volume concentration, %	60.5
Zinc dust / epoxy resin ratio (solids)	90 / 10
Viscosity @ 25°C, Stormer viscometer, kreb units initial after 2 weeks @ 49°C / no gassing after 2 months @ 25°C / no gassing	 100 121 106
Cure schedule	7 days @ 25°C
Substrate	Steel
Film thickness, mils	3-4
Dry time, minutes set-to-touch	 2

paper free dry hard dry through	6 11 13
Pencil hardness, 1 day	HB-F
Flexibility, cylindrical mandrel, ½ in	Pass
Water resistance @ 25°C (77°F), 3 months	No effect
Sea water resistance @ 25°C (77°F), 3 months	No effect
Salt spray resistance @ 25°C (77°F), 1000 hours	No. 6 med., dense blisters

Formulation 3 - White Collapsible Tube Coating

Product	Pounds	Gallons
Rutile titanium dioxide[1]	212.1	6.36
Pigment suspension agent[2]	1.5	0.11
Araldite® GZ 488 N-40	662.8	82.85
Urea-formaldehyde resin, 60% N.V.[3]	88.5	10.33
Flow control agent[4]	3.1	0.35
Total	968.0	100.00

[1]TiPure R-902, Dupont Co. or equal
[2]Betone 34, Rheox Inc. equal
[3]Beckamine 21-511, Reichhold chemical co. or equal
[4]SR-82, General Electric or equal

Formulation 3 - Physical Properties

Property	Value
Non-volatile content, %	55
Pigment/binder ratio	40/60
Epoxy/UF resin ratio (solids)	83/17
Cure schedule	20 min @ 191°C

Storage

Araldite® GZ 488 N-40 Resin is supplied in 400 pound steel drums. It should be stored in a dry place, in the sealed original container, at temperatures between 5°C and 25°C (41°F and 77°F). Under these storage conditions the shelf life is **5 years** (from date of manufacture). The product should not be exposed to direct sunlight.

Precautionary Statement

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First Aid!
Refer to SDS as mentioned above.

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Main Offices:

Huntsman Corporation
10003 Woodloch Forest Dr
The Woodlands, TX 77380
888-564-9318

Huntsman Advanced Technology Center
8600 Gosling Rd.
The Woodlands, TX 77381
281-719-7400