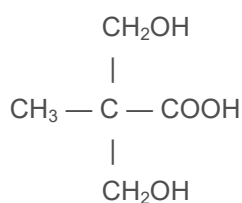


DMPA[®]

DMPA[®] Dimethylolpropionic Acid in Water Soluble Urethane & Polyester Resins



CAS Number: 4767-03-7

DMPA[®] Dimethylolpropionic Acid is both a glycol and a carboxylic acid. Because the carboxyl group is tertiary, the hydroxyl groups can be formulated easily into the backbone of a polymeric chain with no need to block the carboxyl group to prevent reaction.

Specifications

Property	Regular Grade
Hydroxyl Content, wt %	24.0 min
Neutralization Equivalent	141.0 max
Ash as Na ₂ O, wt %	0.03 max
Moisture, wt %	0.3 max
Water Insolubles, ppm	50.0 max
Colour, APHA	250 max

EUROPE

Charleston Road, Hardley,
Hythe, Southampton, Hampshire
SO45 3ZG UK
Call +44 2380 245 437

NORTH AMERICA

300 Brookside Avenue,
Building #23, Suite 100 Ambler,
PA 19002 USA

Call +1 215 773 9280 Toll

Free 888 519 3883

Email: PaintsandCoatings@geosc.com

www.geosc.com

The following formulation was used to prepare the water soluble urethane / polyester resin RD9203 described in this bulletin. The preliminary data presented indicate that varnishes incorporating such resins have excellent package stability and rapid dry time. These formulations are merely illustrative of many possible variations for a concept that offers the polymer chemist a way to meet specific needs.

Urethane / Polyester Resin Production

Table 1—Resin Preparation

	Parts by Weight
Sylfat [®] v-18 Soya Fatty acid (b)	481
DMPA[®] Dimethylolpropionic Acid (a)	136
TRIMET[®] TME (a)	74
Pentaerythritol, technical	53
Dibutyl tin oxide	1
Butyl Cellosolve acetate (c)	101
Toluene diisocyanate (portion 1)	217
Toluene diisocyanate (portion 2)	25
Butyl Cellosolve (c)	200
Isobutyl alcohol	104

Processing:

1 Mix first 5 ingredients and heat to 200-205°C. Hold for an acid value of 65-70 (about 1hr), then cool to 150°C and seal kettle.

2 Continue cooling to 50°C and add butyl Cellosolve acetate. At 50°C, add first portion of toluene diisocyanate over an 1 hour period; allow temperature to exotherm to 100°C. *Watch for foaming!*

3 Process at 80-90°C to complete reaction of toluene diisocyanate; use second portion of toluene diisocyanate as needed to obtain desired viscosity .

4 Add butyl Cellosolve and isobutyl alcohol solvents to adjust to desired viscosity and non-volatile specification.

All information and data, including the formulations and procedures discussed herein, are believed to be correct. However, this should not be accepted as a guarantee of their accuracy, and confirming tests should be run in your laboratory or plant. No statement should be construed as a recommendation for any use which would violate any patent rights. Sales of all products are pursuant to terms and conditions included in GEO Specialty Chemicals sales documents. Nothing contained therein shall constitute a guarantee or warranty with respect to the products described or their use. Safety information regarding these products is contained in their Safety Data Sheets. Users of these products are urged to review and use this information.

REVISION DATE: OCTOBER 2020

DMPA[®] and TRIMET[®] are registered trademarks of GEO Specialty Chemicals, Inc.



G E O[®]
SPECIALTY CHEMICALS

Table 1—Resin Characteristics

	Properties
Colour, Gardner	8 max
Acid Value, mg KOH/g	45-55
Non volatile matter, %	75 ± 2'
Clarity	Clear

Clear Water Soluble Varnish formulation

Table 2—Clear Water Soluble Varnish formulation

	kilogrammes	Litres
Resin RD9203	172.3	11.64
Butyl Cellosolve	32.3	2.5
1-Butanol	10.9	0.96
12% Cobalt NuXtra [®] drier (d)	1.3	0.09
9% Manganese NuXtra [®] drier (d)	1.8	0.13
Activ-8 [®] drier (e)	1.2	0.09
Ammonium hydroxide (26° Be')	6.8	0.531
Water	233.0	16.3
Total	459.6	32.24
pH: 7.5-8.5		

- (a) GEO Specialty Chemicals
- (b) Sylvachem Corporation
- (c) Union Carbide Corporation
- (d) Nuodex Division, Tenneco Corp.
- (e) R.T. Vanderbilt Co. Inc.

All information and data, including the formulations and procedures discussed herein, are believed to be correct. However, this should not be accepted as a guarantee of their accuracy, and confirming tests should be run in your laboratory or plant. No statement should be construed as a recommendation for any use which would violate any patent rights. Sales of all products are pursuant to terms and conditions included in GEO Specialty Chemicals sales documents. Nothing contained therein shall constitute a guarantee or warranty with respect to the products described or their use. Safety information regarding these products is contained in their Safety Data Sheets. Users of these products are urged to review and use this information.

REVISION DATE: OCTOBER 2020

DMPA[®] and TRIMET[®] are registered trademarks of GEO Specialty Chemicals, Inc.

Dry time & Early Water Resistance

Wet films of 0.04 mm were drawn down, dry times were measured and the average reported.

Dry time & Early Water Resistance

	Result
Dry to touch	20 minutes
Dust Free	45 minutes
500 gram Zapon	90 minutes

The films were allowed to dry for 24 hrs., then a drop of water was placed on each of the films and covered with a watch glass. After one hour, the water was taken off with a blotter and the films were examined for spotting and softening.

	Result
hr. after water spotting	slight softening
1 hr. after spot removal	film recovers

All information and data, including the formulations and procedures discussed herein, are believed to be correct. However, this should not be accepted as a guarantee of their accuracy, and confirming tests should be run in your laboratory or plant. No statement should be construed as a recommendation for any use which would violate any patent rights. Sales of all products are pursuant to terms and conditions included in GEO Specialty Chemicals sales documents. Nothing contained therein shall constitute a guarantee or warranty with respect to the products described or their use. Safety information regarding these products is contained in their Safety Data Sheets. Users of these products are urged to review and use this information.

REVISION DATE: OCTOBER 2020

DMPA[®] and TRIMET[®] are registered trademarks of GEO Specialty Chemicals, Inc.

Stability

A 4-oz. bottle of the varnish was placed in an oven at 50°C and was observed for changes in appearance and pH.

Stability

Varnish	pH	Appearance
Initial	7.5	clear
1 week	7.2	clear
2 weeks	7.1	clear
3 weeks	7.2	clear
4 weeks	6.8	clear
5 weeks	6.8	clear
6 weeks	6.6	hazy
7 weeks	6.2	separated

Registration & Regulatory Information: Please refer to the safety datasheet.

Handling & Storage: DMPA[®] is classified as “DOT not regulated” by the US Department of Transportation and requires no special labelling for shipment. The Harmonized Tariff Code is 2918.19.40

DMPA[®] should be stored in a clean, dry area, following good warehousing practices.

Shelf-life: DMPA[®] has a minimum shelf of not less than 3 years if stored in its original unopened container and under normal storage conditions.

Miscellaneous: DMPA[®] is packaged in 250lb fibre drums, 50lb and 25kg multi-wall paper bags with HDPE liners and 500kg super sacks with LDPE liners.

All information and data, including the formulations and procedures discussed herein, are believed to be correct. However, this should not be accepted as a guarantee of their accuracy, and confirming tests should be run in your laboratory or plant. No statement should be construed as a recommendation for any use which would violate any patent rights. Sales of all products are pursuant to terms and conditions included in GEO Specialty Chemicals sales documents. Nothing contained therein shall constitute a guarantee or warranty with respect to the products described or their use. Safety information regarding these products is contained in their Safety Data Sheets. Users of these products are urged to review and use this information.

REVISION DATE: OCTOBER 2020

DMPA[®] and TRIMET[®] are registered trademarks of GEO Specialty Chemicals, Inc.