

**OROTAN™ N-4045 Pigment Dispersant**

For Latex Paint Formulations

**Regional Product Availability**

EMEA

**Description**

OROTAN™ N-4045 Pigment Dispersant is a polycarboxylic acid pigment dispersant that offers excellent performance at an economical price.

OROTAN™ N-4045 Pigment Dispersant can be used for a wide variety of latex paint formulations. It is suggested for low sheen flat through semi-gloss Acrylic, Styrene- Acrylic and Vinyl Acrylic formulations and is effective over a pH range of 6.5 to 10 with a wide temperature range.

OROTAN™ N-4045 Pigment Dispersant is supplied at 45% solids in the sodium form. It is highly compatible with anionic HASE and ACRY SOL™ DR Associative Rheology Modifiers offering excellent heat age and viscosity stability. It is a very low foaming dispersant and is very efficient to disperse mineral slurries.

OROTAN™ N-4045 Pigment Dispersant is most commonly used at levels of 0.3%–1.0% active ingredient based on total weight of pigment and extenders.

**Characteristics of the Product**

- Lower formulated cost
- Low millbase viscosity for efficient dispersion
- Wide versatility. Can be used in flat through semi-gloss formulations
- Highly compatible with anionic HASE and ACRY SOL™ DR Type Rheology Modifiers
- Excellent colour acceptance with high reproducibility
- Excellent heat-age and shelf stability
- Low odour
- Easy to process and handle

**Typical Properties**

These are typical properties, not to be construed as specifications	
Appearance	Clear solution to slightly yellow
Solids content (%)	~45
pH as is (at 25°C)	6.5–7.5
Viscosity (mPa.s at 25°C)	~850
Specific gravity (wet polymer)	1.25–1.35
Solvent	Water

## Formulations Guidelines

### Technical Evaluation of OROTAN™ N-4045 Pigment Dispersant versus Competitive Dispersants

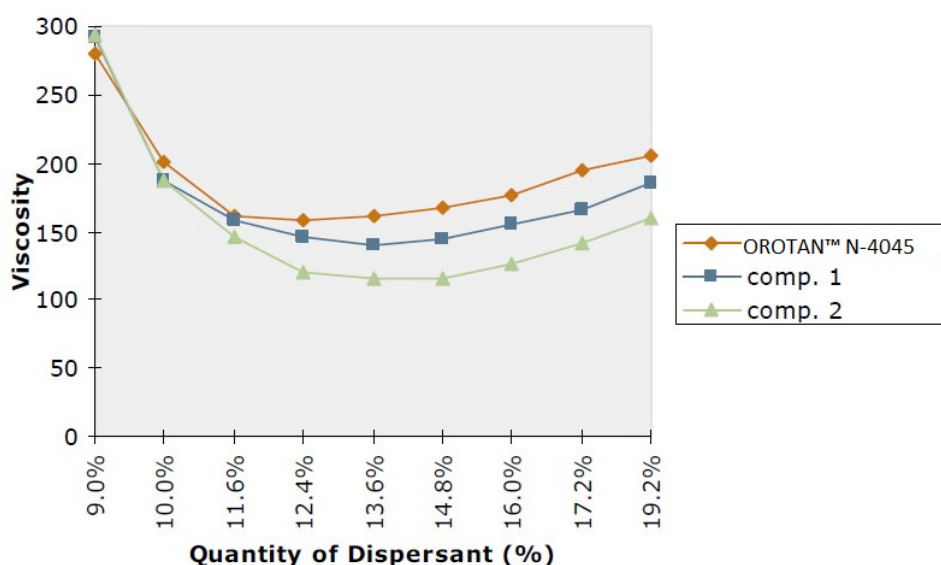
#### I. Introduction

In order to evaluate the performance of OROTAN™ N-4045 Pigment Dispersant, Dow's European Coatings Laboratory compared OROTAN™ N-4045 Pigment Dispersant with two competitive polyacid dispersants in acrylic matt and silk paints. For each dispersant, a dispersant demand curve was generated by plotting Brookfield viscosity versus the level of dry dispersant on dry powders. Next, the minimum dispersant levels were determined.

The matt paints were then formulated at two levels: 2x and 4x the minimum dispersant level. The gloss paint was formulated at 2x the minimum dispersant level. The paints were then tested for initial viscosity, viscosity variation with time, contrast ratio, gloss, scrub resistance and drying time. A summary of the key observations follows.

#### II. Evaluation In Matt Paint (77% PVC/23% Volume Solids)

##### a) Dispersant Demand



#### Conclusion

OROTAN™ N-4045 Pigment Dispersant demonstrated similar efficiency as Competitor 1 and both were more efficient than Competitor 2 in the matt paint that was evaluated.

##### b) Drying time (300µm application)

Dispersant at 2x the minimum level			
Thickener	OROTAN™ N-4045 Pigment Dispersant	Competitor 1	Competitor 2
HEC	23 min.	20 min.	19 min.
ACRYSOL™ DR-73 ER Thickener	22 min.	21 min.	20 min.

Dispersant at 4x the minimum level			
Thickener	OROTAN™ N-4045 Pigment Dispersant	Competitor 1	Competitor 2
HEC	22 min.	21 min.	22 min.
ACRYSOL™ DR-73 ER	20 min.	20 min.	19 min.

### Conclusion

The paints formulated with OROTAN™ N-4045 Pigment Dispersant had drying times similar to those of the two competitive polyacid dispersants.

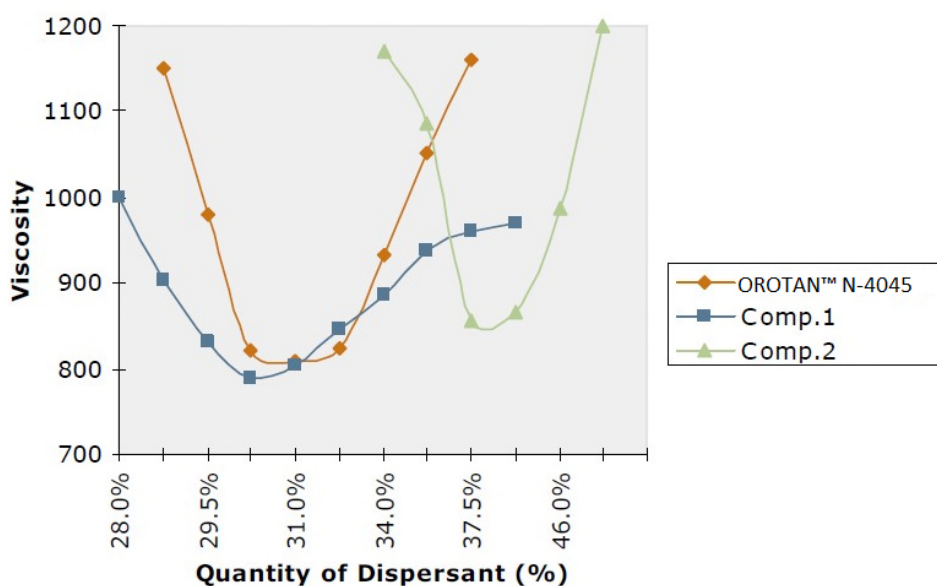
### c) Scrub Resistance (number of cycles to reach 50% loss)

### Conclusion

The matt paints formulated with OROTAN™ N-4045 Pigment Dispersant provided a similar level of scrub resistance as paints formulated with the two competitive polyacid dispersants.

## III. Evaluation In Silk Paint (35% PVC/26% Volume Solids)

### a) Dispersant Demand



### Conclusion

In the silk paint, the efficiency of OROTAN™ N-4045 Pigment Dispersant is similar to that of Competitor 1, however both OROTAN™ N-4045 Pigment Dispersant and Competitor 1 are more efficient than Competitor 2.

### b) Gloss Measurement

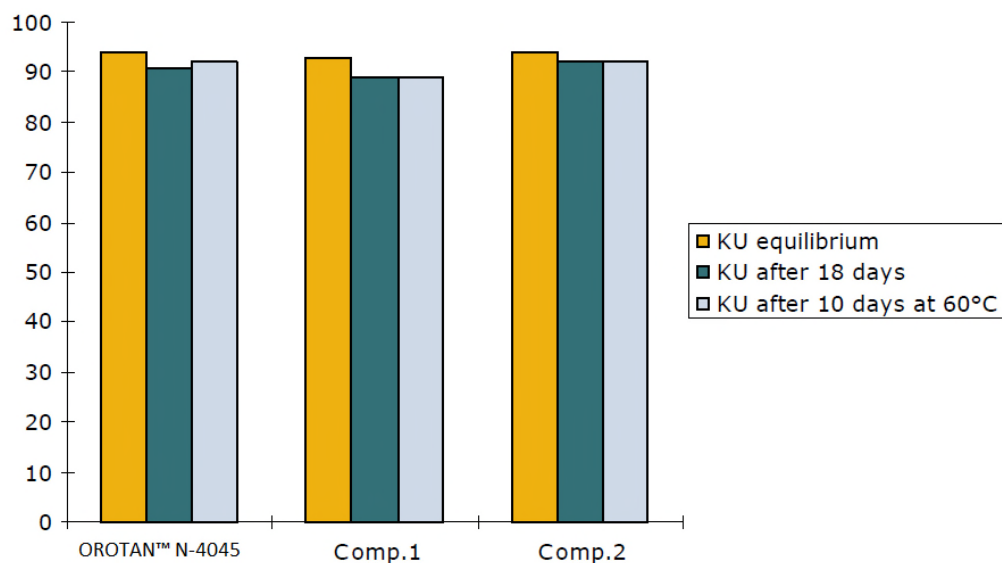
Cellulosic thickened paints			
	Gloss 20°	Gloss 60°	Gloss 85°
OROTAN™ N-4045 Pigment Dispersant	21.4	60.1	88.1
Competitor 1	21.9	60.3	88.2
Competitor 2	17.2	56.4	86.5

Acrysol™DR-73ER thickened paints			
	Gloss 20°	Gloss 60°	Gloss 85°
OROTAN™ N-4045 Pigment Dispersant	18.6	57.1	85.3
Competitor 1	18.3	56.5	83.4
Competitor 2	14.1	52.2	81.6

#### Conclusion

Gloss level was comparable among the silk paints formulated with OROTAN™ N-4045 Pigment Dispersant and Competitor 1, however, both provided higher gloss levels than the silk paints formulated with Competitor 2.

### c) Viscosity Stability on Heat Ageing



#### Conclusion

Paints formulated with all three dispersants demonstrated similar viscosity stability.

**Handling Precautions** Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

**Storage** Store products in tightly closed original containers at temperatures recommended on the product label.

**Disposal Considerations** Dispose in accordance with all, local or national regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local or national regulations. Contact your Dow Coating Materials Technical Representative for more information.

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To contact us, call:  
**Europe, Middle East, Africa & India:**  
**+31 115 672 626**

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