

## Product data sheet

## ZEFFLE SE-405

## High Performance Waterborne Fluoropolymer Emulsion for Coatings

ZEFFLE SE-405 is a high performance, waterborne 1K fluoropolymer emulsion that provides excellent weatherability in coatings. Typical applications include coating of bitumen, concrete, etc.

## Characteristics

- Amorphous type polymer consisting of a VdF copolymer and an acrylic polymer
- Dries at room temperature and medium temperatures to form a film with high gloss

Coating formulations based on ZEFFLE SE-405

- show excellent weatherability, chemical resistance and dirt removability
- offer a wide range of colours
- can be applied using conventional methods like spray, brush, roll, etc.

## Physical Properties

Appearance	Milky liquid
Solid content	51 ± 1 mass%
Viscosity	10 - 100 mPa·s (BM type viscometer, 25°C)
pH	7 – 8
MFT (minimum film forming temperature)	6 - 14°C
Tg	Approx. 14°C (Differential Scanning Calorimeter)
Ionic character	Anionic / non-ionic
Particle size	Approx. 200nm (dynamic light scattering)
Storage stability	OK (4 weeks at 50°C)
Mechanical stability	OK (5000rpm, 1min in a homo mixer)
Freezing stability	OK (below 200% of viscosity increase; 1 cycle = 16 hours at -15°C, 12 hours at 20°C)

Table 1: Typical properties are not suitable for specification purposes.

## Formulation example for a white formulation

### 1. Preparation

Adding rate of additives can be changed depending on product grade used, purpose, etc.

#### Mill base

Ingredient	Mass%
Water	22,2
Dispersant <sup>1</sup>	3,5
Ethylene glycol	4,0
Titanium dioxide pigment <sup>2</sup>	70
Defoamer <sup>3</sup>	0,3
<b>Total</b>	<b>100</b>

High speed grind with glass beads

#### Letdown

Ingredient	Mass%
ZEFFLE SE-405	68,04
Ammonia water (28%)	0,35
Mill base	24,49
Coalescent <sup>4</sup>	5,2
Thickener <sup>5</sup> (17,5% solid)	0,56
Water	1,36
<b>Total</b>	<b>100</b>

Tables 2-3: Formulation using  $TiO_2$  and hardener: Desmodur N3300

### 2. Application method

ZEFFLE SE-405 base coating can be applied by general methods such as brush, roller, spray, etc.

### 3. Drying condition

As a rough guide, SE-405 base coating can be dried for 7 - 10 days at room temperature or for 3 - 4 days at 40°C in a convection oven.

<sup>1</sup>Dispersant examples:

- Disperbyk 190, 199, 2010, Altana
- Nuosperse FX610, Elementis

<sup>2</sup>Alternative rutile type

$TiO_2$  pigments:

- Kronos 2310, KRONOS TITAN
- D2667, Sakai Trading Europe
- Tipaque CR-97, Ishihara Sangyo

<sup>3</sup>Defoamer examples:

- Surfynol DF-110D, Air Products
- Byk 019, Byk 028, Altana
- Dapro DF 7580, Elementis
- TEGO AIREX 902W, Evonik

<sup>4</sup>Coalescent agent examples:

- DBE-IB, Chemours
- Di-ethyl Adipate
- Texanol
- PGDA
- DEDG
- Rhodiasolv RPDE
- Rhodiasolv DIB
- Rhodiasolv IRIS

<sup>5</sup>Thickener examples:

- Byk 425, Altana
- Acrysol RM-8W, Dow Chemical

## Film performance

Representative data: white pigmented film, coated on surface treated aluminium panel

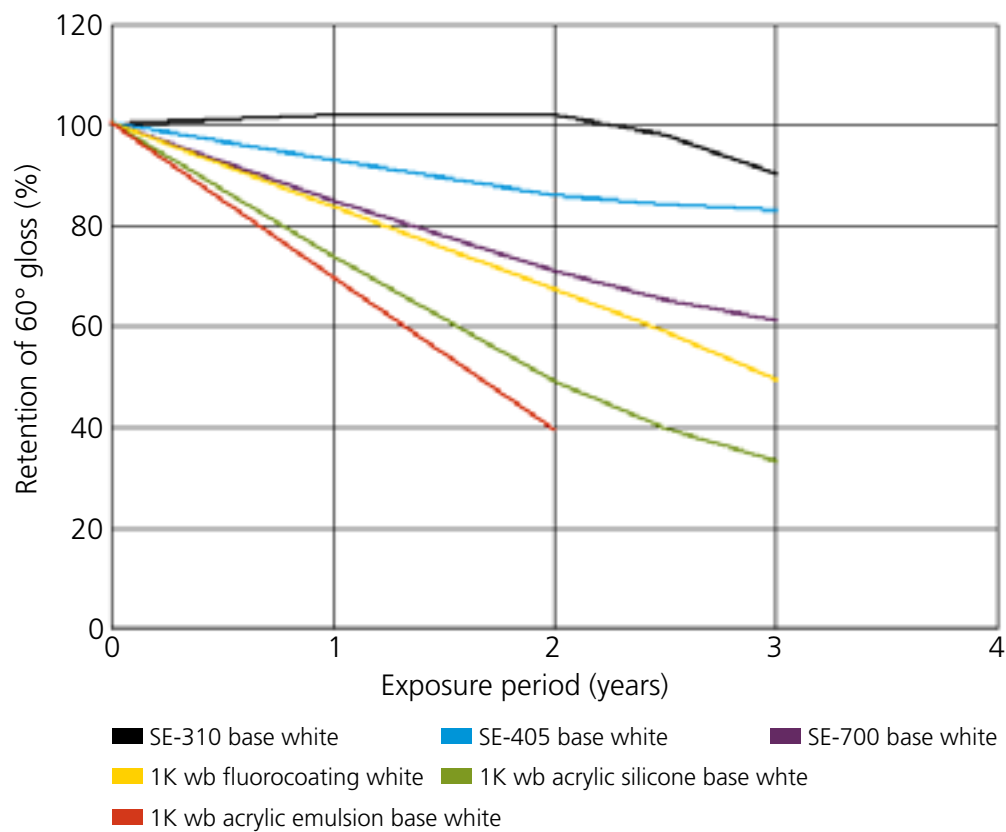


Figure 1: Weather resistance. Outdoor exposure at Miyakojima Island (Japan). Miyakojima shows a subtropical climate similar to Florida and is an internationally recognised location for exposure tests.

### Storage

- Store ZEFFLE SE-405 inside at temperatures between 10 and 35°C (<40°C)
- Keep ZEFFLE SE-405 away from heat, sparks and open flames

### Safety

Please use body protection, protective work clothing and protective gloves.  
Please wear safety glasses to protect your eyes.

Before using this product, please read the current Material Safety Data Sheet and the precautionary statement on the product package.

The information is based on practical experience and is intended for information and guidance only. No liability can be accepted.

### Packaging

ZEFFLE SE-405 is available in 180kg drums.

### ISO 14001 certification

Daikin Chemical Europe GmbH and all its suppliers within the Daikin Group have obtained the ISO 140001 certification, an international standard concerning the environmental management system in our factories. ISO 14001 is a standard established by the International Organization for Standardization which applies to environmental preservation activities. Activities, products and services of our fluorochemicals plants have been certified as being environmentally sound by an internationally recognized certification body.

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