DAIKIN

TECHNICAL DATA SHEET

ZEFFLE GK-870

FEVE Resin

Fluoropolymer, Weather, Chemical/ Solvent, and Stain Resistant Coating

Characteristics

Solventborne copolymer of tetrafluoroethylene and vinyl monomer

Chlorine free

Excellent weather resistance with decades of performance

Anti-corrosion, chemical resistance, and staining reduction / elimination

Various gloss and colors can be obtained

Curing from room temperature to 150°C

Cured with polyisocyanate or melamine-type crosslinking agents

Applications can be performed by various methods, including spraying, brushing, roller painting and in roll to roll processes

Low vapor permeability

Common ZEFFLE Applications:

Photovoltaic Backsheets

Industrial Paints

Protective Films

- Overlaminates
- Signage
- Automotive
- Window

Electronics Coatings

Chemical Resistant Topcoat

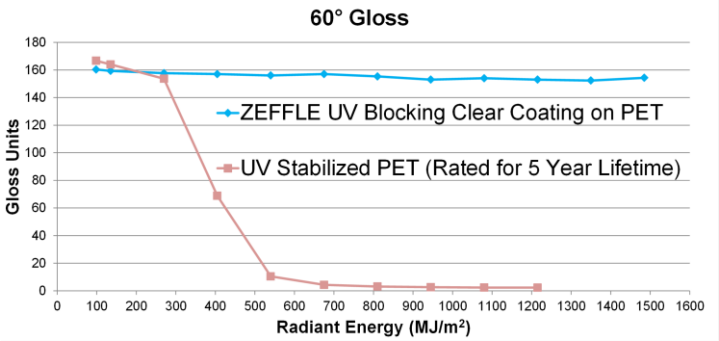
Real World Performance:

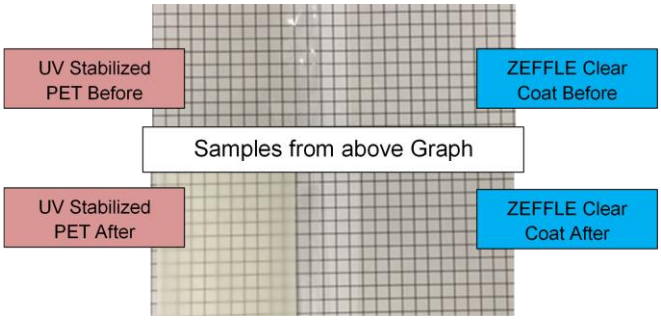
ZEFFLE GK-870 (TFE Based)

Competitor FEVE (CTFE Based)

Corrosion test (clear coat on Stainless Steel without primer):
4 years real world outdoor exposure in semi-tropical marine environment (Miyakojima Island in Okinawa, JP)

Xenon Arc Weathering of ZEFFLE Clear Coat on PET





Properties*	Value
Resin Viscosity (25°C; 10 sec^{-1})	550-1300 cps
Molecular Weight	Moderate
Resin Solids (wt%)	65%
Tg (°C)	25-28
OH Value (mg KOH/g polymer)	61-65
Acid Value (mg KOH/g polymer)	< 5
Solvent Blend	n-butyl acetate
VOC (Calculated via EPA Method 24)	396 g/L

***Typical properties are not suitable for specification purposes.**

Basic ZEFFLE Hardener Calculation:

Using Covestro AG, Desmodur N3300A as an example

All numbers should be referenced from COA

Grams of polyisocyanate for 100 grams of GK-870 varnish =

$$\frac{100 * (\text{solid content}/100) * \text{OH number} * \text{NCO formula weight} * (\text{NCO/OH mole ratio})}{(\text{KOH molecular weight}) \times 1000 \times (\text{NCO content in polyisocyanate}/100)}$$

- Solid contents of GK-870: 65 mass %
- GK-870 solid hydroxyl value: 64 mg KOH/g
- NCO formula weight: 42 g/mole
- NCO/OH mole ratio: 1.0 (Based on desired performance)
- KOH molecular weight: 56.1 g/mole
- Polyisocyanate NCO content: 21.8 mass % (ex. Desmodur N3300A)

$$= \frac{100 \times (65 / 100) \times (64) \times (42) \times (1.0)}{(56.1) \times 1000 \times (21.8 / 100)} = 14.3 \text{ g}$$

Recommended Curing:

For Films

120°C for 5-6 minutes film temperature OR
150°C for 2 minutes film temperature
Cool to 40°C before rolling
Allow extended curing at 40 to 60°C for 2-3 days

For Paints

Ambient cure for ~72 hours or use catalyst or elevated curing temperatures.

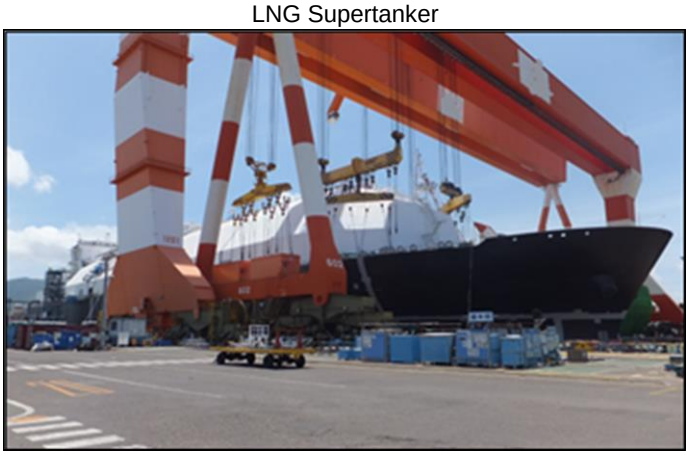
Comparison Chart

(Immersion Testing)

	Test Conditions	ZEFFLE	Current Acrylic Silicone	Current Acrylic Urethane
8% Buffered HF	1 hr @ RT	A	B	C
50% HF	1 hr @ RT	A	C	C
60% Sulfuric Acid	24 hr @ RT	A	A	A
	2 hr @ 60°C	A	A to B	B
50% Nitric Acid	2 hr @ RT	A to B	C	C
35% HCl	2 hr @ RT	A	A	A
50% Acetic Acid	2 hr @ RT	A	A to B	A to B
10% NaOH	14 days @ RT	A	A to B	A to B
10% H_2O_2	14 days @ RT	A to B	B	C
Butyl Acetate	24 hr @ RT	A	A to B	A to B
MEK	24 hr @ RT	A	A to B	A to B
Chloroform	24 hr @ RT	A	A to B	B
Petroleum Benzene	24 hr @ RT	A	A to B	B

Notes: A (Excellent), B (Fair), C (Poor)

LNG Supertanker



UV Protection of PET	
Xenon Arc Testing	
1500 hrs Modified ASTM G-155 Cycle 1 from 0.35 to 1.5 W/m^2	
White Outer Layer	**20° Gloss**
ZEFFLE	95%
PVdF	71%
PVF	9%
UV Stabilized PET	4%