Nissin Chemical Industry Co., Ltd.

Shin-Etsu Group

CHALINE® E-370 & LC-190 TECHNICAL DATA SHEET

Product description

CHALINE is a hybrid emulsion (coating type) which offers the surface activity of silicone resin and the film-forming ability of acrylic resin as well as being very compatible with other types of resins. CHALINE has a *unique silicone-rich silicone/acrylic composition*. CHALINE can be added to aqueous resin coating materials as an additive to impart surface activity to resin-molded products, resin films, resin sheets, artificial leather and metallic materials.

Product characteristics

- Is very water resistant.
- Improves sliding properties, preventing blocking while improving wear resistance.
- CHALINE forms a hybrid film, as it is highly miscible with both anionic and non-ionic emulsions.

Main Applications

- Vehicle upholstery materials
  - Synthetic leather for interiors
  - Airtight sealing materials for doors and window sashes
  - Soundproofing materials
- Coatings
- Slip agents for ink
- Scratch resistant agent
- Stain resistant agent

General properties

Attributes	E-370	LC-190
Recommended Usage	Providing Good Sliding	Enhancing Wear Resistance
Solid (%)	45	42-45
Viscosity (mPa·s)	≤ 500	≤ 500
Si fraction	Medium	High
Mean particle diameter (nm)	300	300
Acrylic component TG (°C)	104	105
pH	5-8	5-8
Ionic character	Anionic	Anionic

International Chemical Inventories

Attributes	E-370	LC-190
US (TSCA)	Yes	Yes
EU (EINECS)	Yes	Yes
Canada (DSL)	No	Yes
China (IECSC)	*1	Yes
South Korea (KECI)	*2	Yes
Taiwan	Yes	Yes

*1: The simple customs declaration process has been completed by Nissin Chemical Industry

*2: The Confirmation of Exemption from Chemical Evaluation has been completed by Nissin Chemical Industry

Providing Surface Activity

CHALINE can achieve the desired surface activity without compromising transparency.

(Ability to provide water resistance, sliding while preventing blocking)

Evaluation Item	Not added	E-370	LC-190
Coefficient of static friction	0.099	0.018	0.013
Coefficient of static friction	0.054	0.014	0.004
Contact angle (°)	80	85	100
Anti-blocking property	X	O	Δ
Haze value (%) (Glass plate: 0.8%)	1.2	3.0	1.6

* **X:** PET films stick together and it cannot be separated. **Δ**: PET improved but still classified as poor. **O:** PET films are good.

Test Methodology

Application amount: 10µm (dry)

Drying conditions: 150°C x 1 minute

Substrate: Polyethylene terephthalate (PET) film

(glass plate was used only for the haze values)

CHALINE E-370 and LC-190 were mixed with aqueous polyurethane (polycarbonate) at 10% solid.

Coefficient of friction: the coefficient of friction was calculated based on the friction observed when 200g of a metal indenter was allowed to come in contact with the coating perpendicularly, and move at 3cm/min.

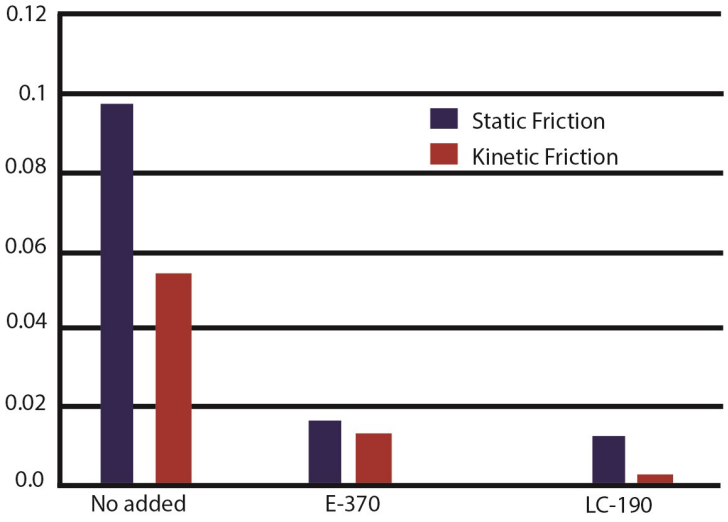
Contact angle: The contact angle of a water droplet was measured 30 seconds after dripping.

Anti-blocking property: After the films were pressed against each other at room temperature at 15kgf using a 50-tpress machine, ease of peeling was evaluated.

Haze Value (transparency): Turbidity was measured using a colorimeter.

CHALINE E-370 & LC-190

Comparison of coefficient of friction



Enhanced Wear-resistance

Test Methodology

Application amount: 10µm (dry)

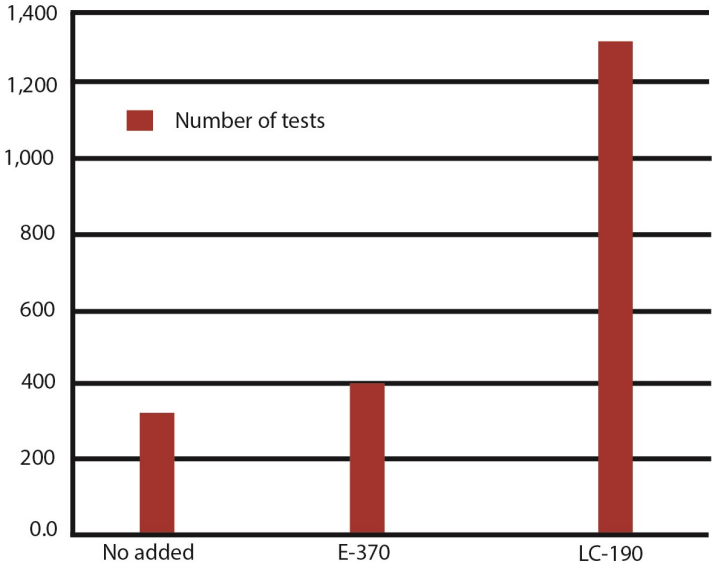
Drying conditions: 150°C x 1 minute

Substrate: Polyethylene artificial leather

CHALINE R-170BX & LC-190 were mixed with aqueous polyurethane (polycarbonate) at 10% solid.

The test piece was allowed to come in contact with a piece of cotton cloth, with 500g applied. The chart below details the number of test cycles after which the substrate broke.

Evaluation item	Not added	E-370	LC-190
Rubber tester (Gakushin-type)	300 times	400 times	1300 times



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Caution

- Follow the precautions in the material safety data sheet and technical references.
- CHALINE for industrial use only.
- The data in this document does not include all specifications. Purchasers must conduct tests of their own before putting the product to practical use to verify its compliance, with their intentions for its employment.
  We give no guarantee that the uses presented in this document do not come in conflict with any patents.
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