替代有机汞铅锡 聚氨酯环保催化剂

Substitutes for Organo-Mercury/Lead/Tin Eco-Friendly Polyurethane Catalysts

广州优润合成材料有限公司

GUANGZHOU YOURUN SYNTHETIC MATERIAL CO., LTD

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CONTENTS

1 Company Profile

Company Profile

Innovation + Eco-Friendly

Guangzhou Yourun Synthetic Material Co., Ltd

YOURUN was founded in 2013, it is a scientific research and production enterprise devotes to the R&D and manufacture of eco-friendly polyurethane catalyst (substitutes for organo-mercury/lead/tin) and functional agents for polyurethane application. Relying on the professional advantages and rich experiences on the polyurethane industry, we provide customers with high-quality and differentiated technical solutions through innovative functional additives.

YOURUN was headquartered in Panyu, Guangzhou. And has a manufactory, Zhaoqing Youchuang New Material Technology Co., Ltd, in Zhaoqing Dawang National High-tech Zone.
Due to the rapid development of YOURUN, a new production base will be established at Guangqing Special Economic Cooperation Zone in 2023. To further our goal of "becoming the most competitive enterprise of eco-friendly organometallic catalysts in China".

Currently, the design production capacity of Zhaoqing factory is 3000 mt/year and the annual output is more than 1000 mt/year. The design production capacity of the new production base will be 8000 mt/year.

Company Profile

- YOURUN is a national high-tech enterprise.
- Obtained ISO9001 Quality Management System Certification
- Obtained Intellectual Property Management System Certification.
- Standardized operation and management. Established a standardized management system for R&D, procurement, production, logistics and product traceability.

2 Products & Applications

Product Line

Leading Products

CATALYSTS

- **CUCAT Series** — Substitutes for Organo-Mercury/lead without bubbles
- **AUCAT Series** — Anti-hydrolysis with good compatibility
- **WCAT Series** — Moisture curing system
- **FOCAT Series** — Foam system
- **BCAT Series** — Organo-Bismuth
- **ZCAT Series** — Organo-Zinc
- **BX Series** — Compound organo-bismuth/zinc

FUNCTIONAL AGENT

- Dispersant Rheological
- Defoaming
- Abrasion Resistant
- Antistatic
- Anti-oxygen Anti-yellowing
- Special Adhesive

CHAIN EXTENDER

- TDMA Series

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Catalysts Characteristics

Eco-Friendly

Substitutes for Organo-Mercury/Lead/Tin

Innovative Functions

Targeting

- Uncatalyzed moisture reacting with isocyanate without bubbles
- Catalyzed the reaction of isocyanate and urethane group

Anti-Hydrolysis

- Inactivation in water-base system

Thermo-sensitivity

- Long potlife

New Functions

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Organo-Bismuth/Zinc BCAT/ZCAT

- YOURUN organo-bismuth/zinc catalysts have seam quality with imported brands.
- YOURUN is one of the most diversified manufacturers of organo-bismuth/zinc catalysts in the world.

Bismuth

General

- BCAT-E16
- BCAT-E20
- BCAT-E25A
- BCAT-E28A

Special

- BCAT-E20CX — Low acid value
- BCAT-T100R — Participate in reaction
- BCAT-T160 — Compatible with polyester

Zinc

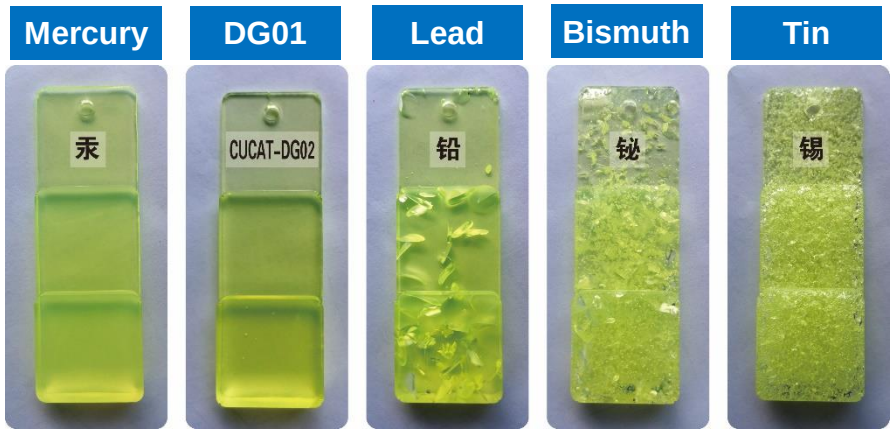
General

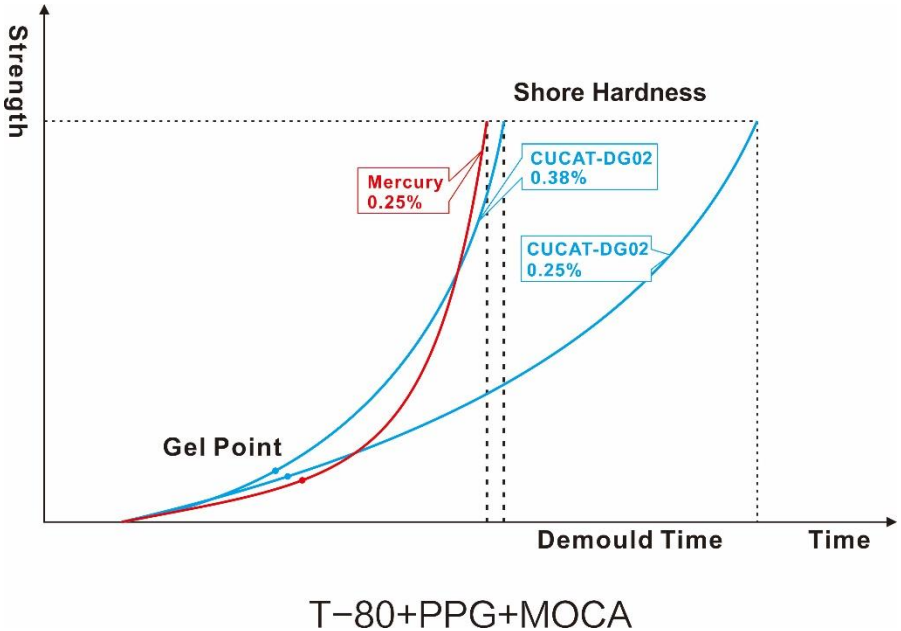
- ZCAT-EY18
- ZCAT-EX16
- ZCAT-EZ19
- ZCAT-EZ22

Special

- ZCAT-T50 — Rapid post-cure

CUCAT Series: Catalytic Properties





T-80+PPG+MOCA

- Insensitive to moisture, uncatalyzed or weak-catalyzed the reaction of -NCO and H_2O, that can solves the problems of pinholes, bubbles, bulges and cracks.

  Solve construction problems which is processed under high temperature and high humidity conditions.

- Long potlife.
- Rapid post-cure to shorten process period.

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CUCAT Series: Representative Products

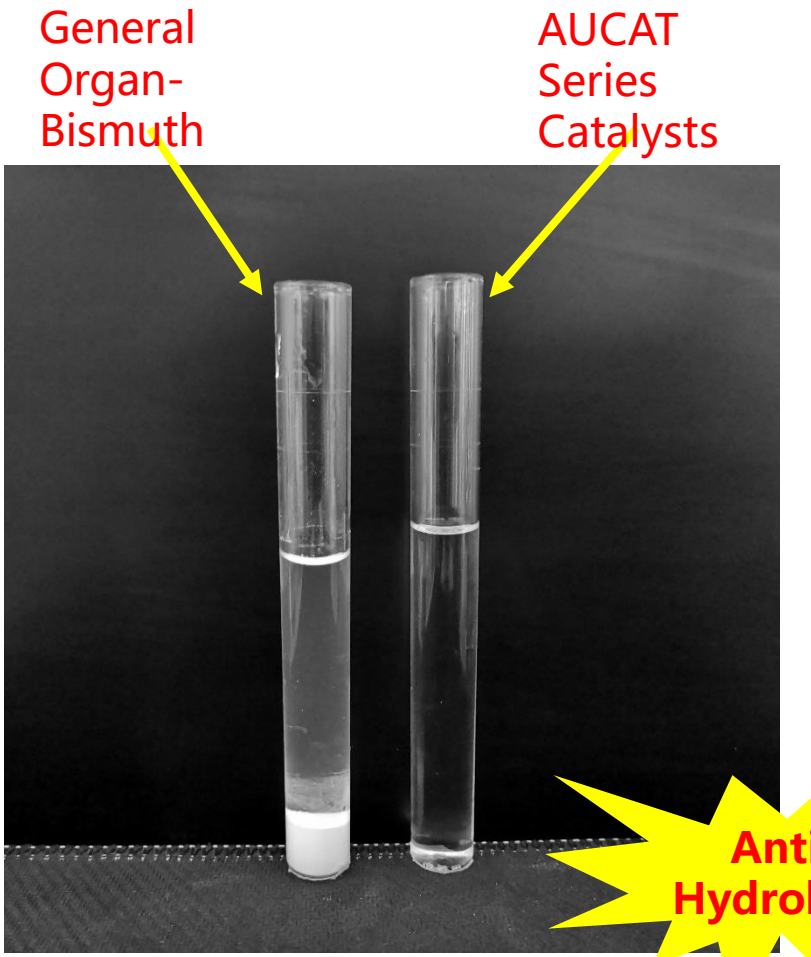
Substitutes for Organo-Mercury/Lead

Trade Name	Recommended Application	Characteristics	Trade Name	Recommended Application	Characteristics
CUCAT-ET01	Various elastomers, especially for soft PU	Fast post-cure, light color with non-coloring the finished products	CUCAT-DG01 CUCAT-DG02	Casters, forklift wheels, Hydrocyclones, spray polyurea, high-rate damping PU, railway ballast PU, etc.	Thermal activity with long potlife and short post-curing time, especially recommended for TDI+PPG+MOCA system.
CUCAT-PD	General use，such as casters, forklift wheels, cyclones and waterproof coatings	Insensitive to moisture, high catalytic activity	CUCAT-GF02	Electronic encapsulating PU	Long potlife and short post-curing time, non-bobbles, non-butyltin.
CUCAT-HA01 CUCAT-HA02	Spray polyurethane-urea	To shorten gel time, insensitive to moisture without bulges and cracks	CUCAT-V Series	Pavement materials of sports runway and basketball courts	Extremely low TVOC, to meet the requirements of national standard (GB36246-2018)
CUCAT-HAB	Adhesive, sealants, nameplate PU, electronic encapsulating PU and coatings	General use, especially for aliphatic isocyanate	CUCAT-SW Series	Mine screen, scraper	Thermal activity with long potlife and short post-curing time.
CUCAT-HS	Various elastomers of MDI system materials，such as casters	Long potlife and short post-curing time	CUCAT-WN Series	Inorganic grouting reinforcement materials	Good compatibility in inorganic materials without delamination, performing moderate exothermic during reaction process

AUCAT Series: Anti-Hydrolysis Organometallic Catalysts

Long-term storage in hydrous materials without deactivation.

- **Long-term storage stability in waterborne latex without deactivation.**
- **Appling in PU foam as gel catalyst, that can be pre-added into polyol components.**
- **And other applications……**



Water content of the system: 30%
Catalyst content: 10%
Hydrolysis condition: two weeks in the 60℃ oven

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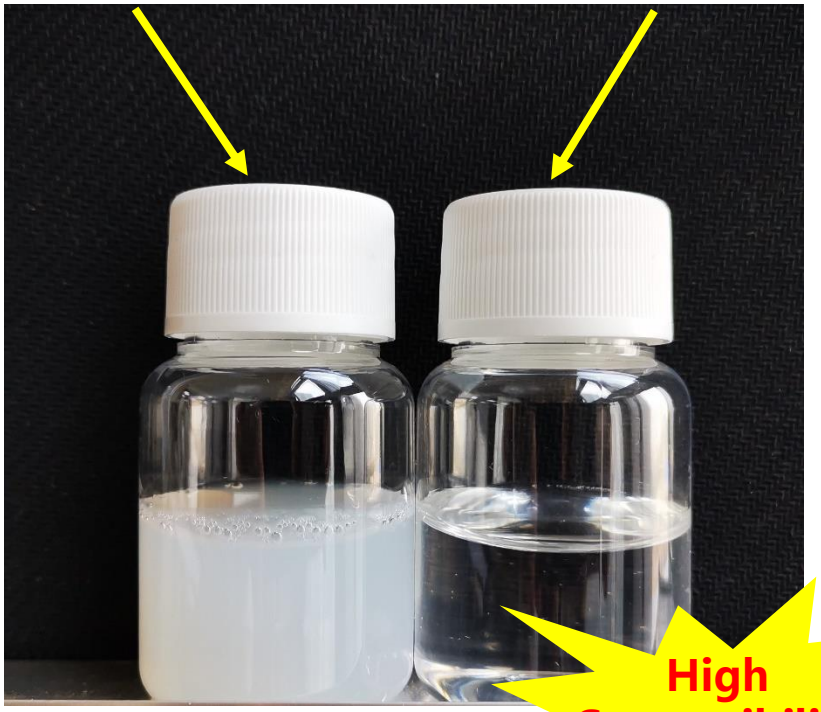
AUCAT Series: High Compatibility in Polyester Polyol

No effect on transparent

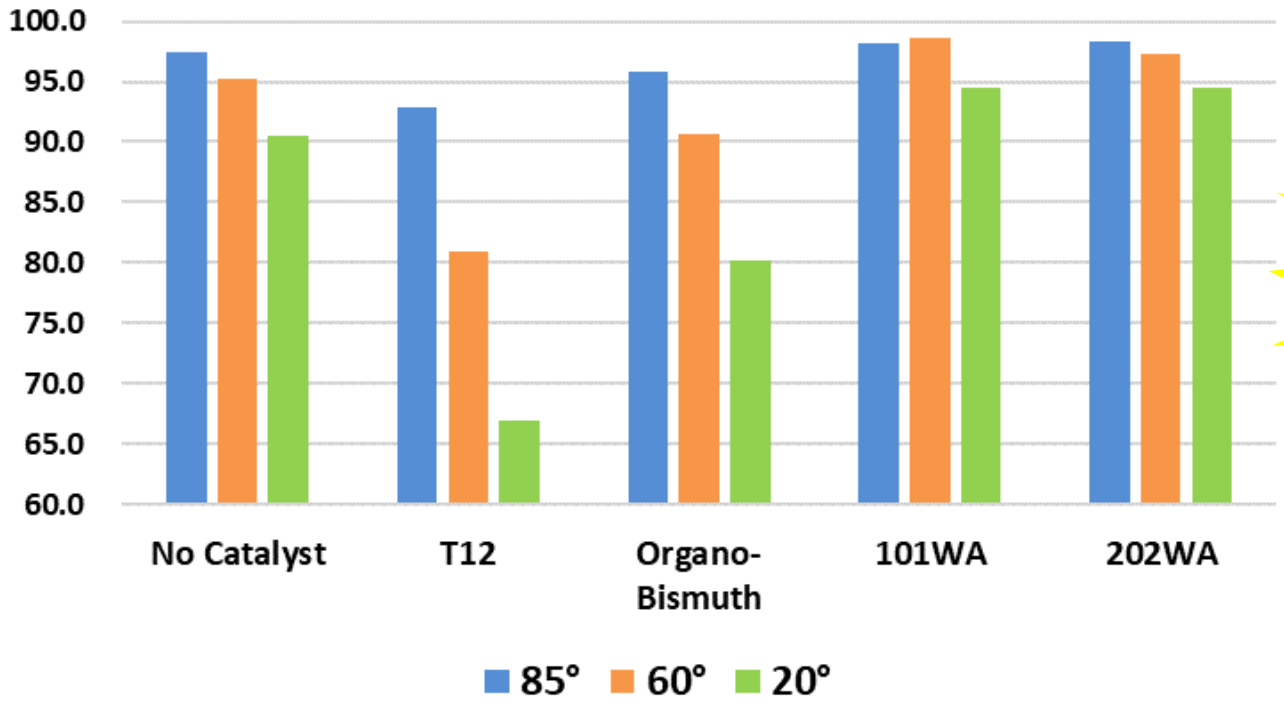
- Appling in synthesizing of **high transparent modified polyurethane UV resin.**
- Appling in tin-free transparent PU shoe materials.
- And other applications……



Experimental system: Polyester type UV resin.
Catalyst content: 1%

AUCAT Series: Appling in Waterborne Coatings

Effect of different catalysts on film gloss of waterborne varnish



Without Loss of Gloss

Experimental system: 2K hydroxyacrylic varnish

Catalyst addition: 0.1%

Wet film thickness: 50 μm

Solid content: 45%

According to above chart, AUCAT-101WA and 202WA have no effect on film gloss.

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AUCAT Series: Representative Products

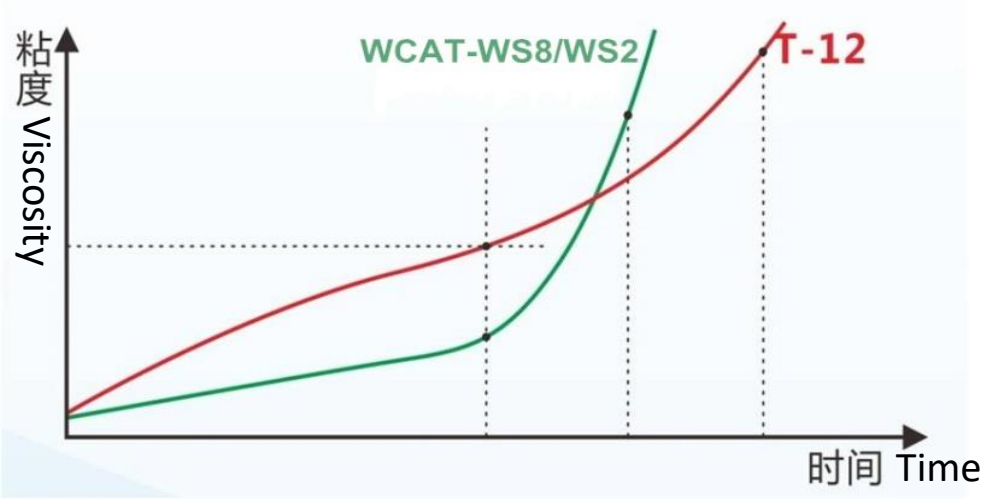
Type	Trade Name	Characteristics	Recommended Application
Functional Catalyst	AUCAT-101	The function of 101 is similar to organo-bismuth and 202 is similar to organo-zinc, which can be used in combination with different ratio to meet various process requirements.	General use, such as elastomers, coatings, PU resin, PUD, etc.
	AUCAT-202		
	AUCAT-1001E	Insensitive to moisture, non-bubbles, fast demolding.	General use in PU CASE, especially for the systems using aromatic amine as chain extender, such as skateboard wheels.
	AUCAT-T62	Special for post-cure catalyst, no effect on potlife.	CASE, floor coatings
	AUCAT-1301	Thermal activity, similar catalytic activity to organo-tin.	Substitute for butyltin, applying in footwear adhesive, aliphatic PU resin。
	AUCAT-501	Anti-hydrolysis eco-friendly tin catalyst	PU foam
Thermo-sensitive Catalyst	AUCAT-RM301	Thermal sensitive, high catalytic activity, very long potlife and short molding time.	MDI mine screen, electronic soft foam, carpet adhesive, solvent-free PU leathers.
	AUCAT-RM401A	High thermal sensitivity, moderate catalytic activity.	High reactive system (MDI), large components, etc.
Waterborne catalyst	AUCAT-101WA	Appling in waterborne system materials with long-term storage, and without deactivation, without loss of film gloss. Traditional catalyst like DBTL or organo-bismuth that are incompatible with waterborne materials. Catalyst is added into iso-harder would cause yellowing, viscosity increase or packaging expansion. AUCAT waterborne catalysts can be applied to solve above problem perfectly.	2K waterborne coatings and 1K stoving enamels based on blocked isocyanates，including hydroxyacrylic coatings, polyurethane coatings, such as wood coatings, auto finish, etc. RM301WA is a waterborne thermosensitive catalyst.
	AUCAT-202WA		
	AUCAT-RM301WA		

WCAT Series: Catalytic Properties

WCAT series catalysts are recommended to moisture curing PU systems, the advantages comparison with DBTL as following:

The viscosity stability of non-solvent PU sealant

Catalyst	Content %	24h	7day
		Viscosity mPa.s 25℃	
T-12	0.05%	49100	50260
WS8	0.05%	29250	29450



- The viscosity of sealant material using WS8 is much lower than which using T-12.
- WCAT series catalyst can provide long potlife and short curing time.
- Due to the low viscosity and long potlife, the surface defects of pinholes and bubbles would be decreased significantly.
- **WCAT series catalysts performs high activity at low temperature conditions (＜5℃),** no worries about outdoor construction in winter.

WCAT Series: Representative Products

Catalysts for moisture curing PU

Trade Name	Recommended Application	Characteristics
WCAT-WS8	Sealants, waterproof coatings, PUR, coatings.	General use，eco-friendly tin catalyst，moderate catalytic activity.
WCAT-WS17	Waterproof coatings, basketball courts.	General use, moderate catalytic activity，decreasing surface pinholes and bubbles.
WCAT-WS13A	Waterproof coatings, basketball courts, coatings.	General use, high catalytic activity, especially suitable for outdoor construction in winter.
WCAT-WP01	Aliphatic PU sealants, coatings.	High catalytic activity, suitable for aliphatic isocyanates PU
WCAT-WH03	For high eco-friendly requirements application. sealants, PUR., coatings.	Tin-free, keep catalytic activity in low temperature.

WCAT-NS series: Catalysts for MS Sealant

The NS Series is chelated tin catalysts with much higher catalytic activity than T-12, recommending to apply in silane modified polyurethane adhesive.

- To promote deep curing.
- High activity with small dosage, low cost in materials.
- Good storage stability.

WCAT-NS01 is similar to NITTO U-220H.

WCAT-NS02 is similar to NITTO U-303.

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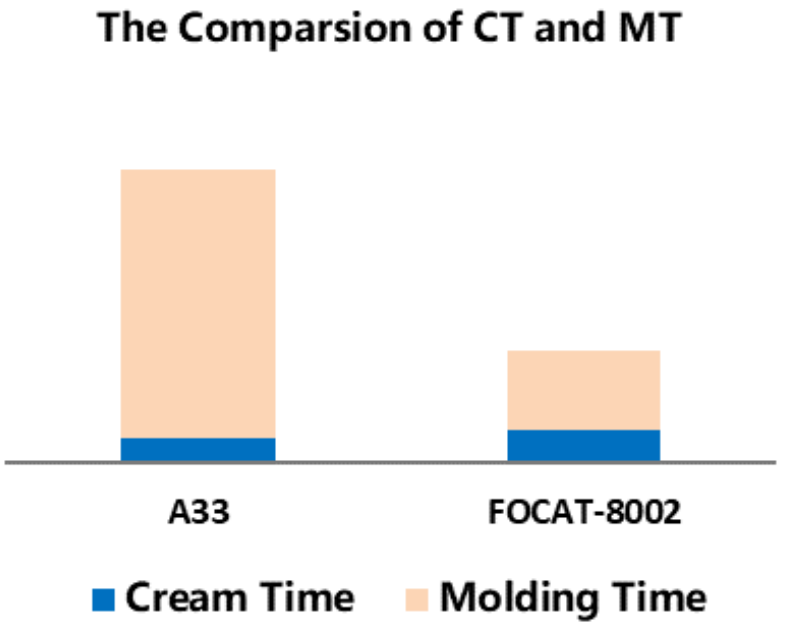
FOCAT Series: Catalytic Properties

PU foam catalysts for water-blown and rigid foam

FOCAT-8002

- Catalytic Properties: Long cream time and short molding time comparing with A33.
- Applications: Sole, insole, imitation wood, rock wool board, etc.



FOCAT-8003M

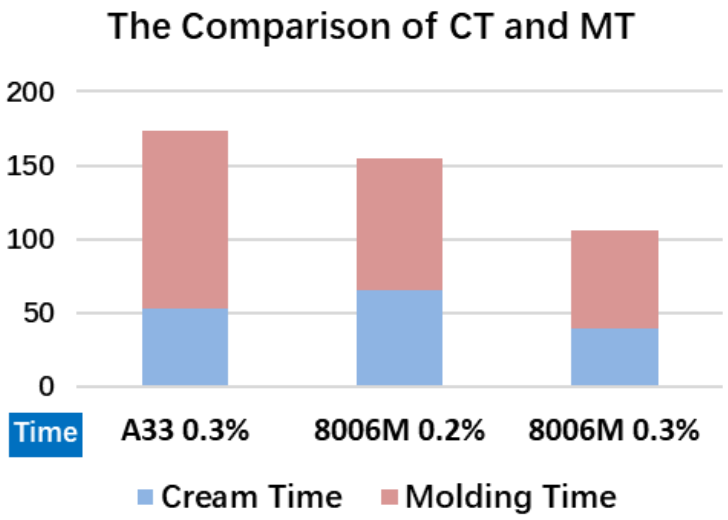
- Catalytic Properties: Gel catalyst, to keep long cream time combination with tertiary amine catalyst, to shorten molding time, and to provide smooth surface for skin-foam.
- Applications: skin-foam steering wheel, PU foam tire, etc.

FOCAT Series: Catalytic Properties

PU foam catalysts for water-blown and soft foam

FOCAT-8006M

- Catalytic Properties: Long cream time and short molding time, increase soft feeling and resiliency.
- 8006M can be used alone to replace traditional combination of tin and tertiary amine.
- Applications: clothing foam, automotive foam, etc.



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FOCAT Series: Representative Products

Catalysts for water-blown PU foam

Trade Name	Recommended Application	Characteristics
FOCAT-8002	Sole, insole, imitation wood, rock wool board, etc.	Tin-free, long cream time and short molding time
FOCAT-8003M	Soft foam, skin-foam steering wheel, PU foam tire, etc.	Tin-free, anti-hydrolysis, replacing organo-tin to combinate with tertiary amine catalyst.
FOCAT-8006M	Soft foam, high elastic foam, slow rebound foam, etc.	Tin-free, short molding time, to provide smooth and stable foam without shrinkage.

Special Functional Catalysts

Thermo-sensitivity

Thermosensitive Delayed Catalysts

According to the different application requirements of MDI high reactive system, YOYRUN has developed RM series thermosensitive delayed catalysts with differentiated thermosensitive temperatures.

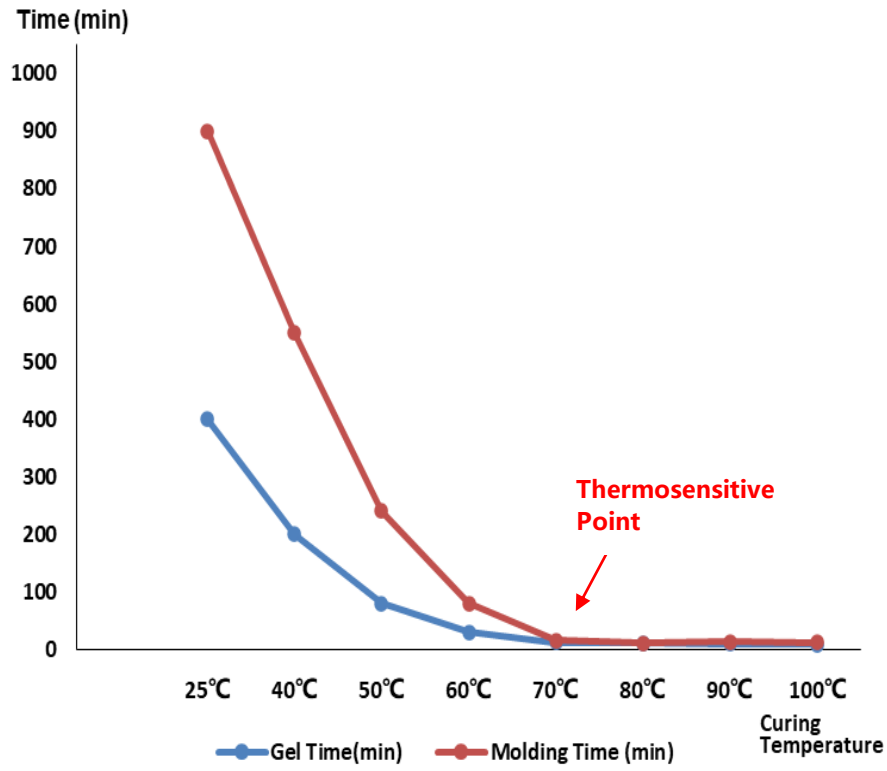
Trade Name	Thermosensitive Temperature	Catalytic Properties
AUCAT-RM301	60-70℃	Insensitive to moisture, to provide excellent mechanical properties to PU
AUCAT-RM401A	80-90℃	
CUCAT-RM50A	50-60℃	
CUCAT-RM70	60-70℃	Fast post-cure
CUCAT-RM90	80-90℃	

Thermo-sensitivity

AUCAT-RM301

- **Long potlife, weak-catalytic activity in room temperature.**
- **Definite thermosensitive temperature, the catalytic activity increases geometrically at thermosensitive point, and the material is molded rapidly.**
- **The catalytic activity is more than 5 times of other commercially catalysts in market.**
- **Eco-friendly without toxic substances.**

Catalytic curves at different temperatures of RM301



The thermosensitive point of RM301 is stable, the catalytic activity will be increased geometrically starting at 60-70℃. According to comparative experiments, setting the molding temperature at 70-80℃, that can provide the best physical properties to PU materials.

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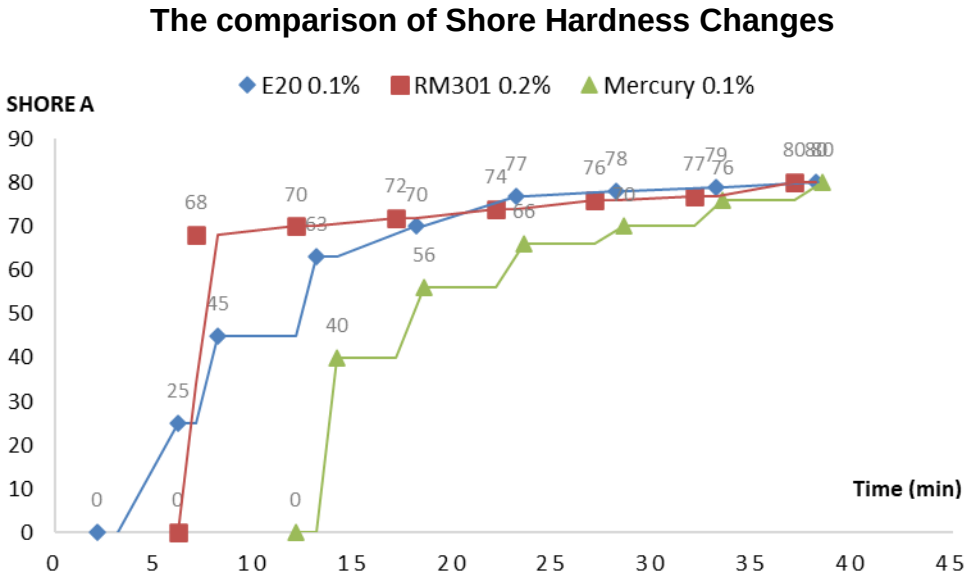
Thermo-sensitivity

AUCAT-RM301

The right figure is hardness-time curve, shows the comparison of AUCAT-RM301, Organo-mercury and Organo-bismuth in the MDI+diol curing system (mixture at room temperature, curing at 80 ℃):

- RM301 provides longer potlife than Organo-bismuth, and the fastest hardness increase compare to mercury and bismuth.
- RM301 is insensitive to moisture without bubbles in PU block, that is similar to mercury.



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Thermo-sensitivity

Thermosensitive Delayed Catalysts

Representative Application

- Non-solvent PU leather materials
- large-scale PU parts, such as wind power generation facilities
- Electronic protection foam

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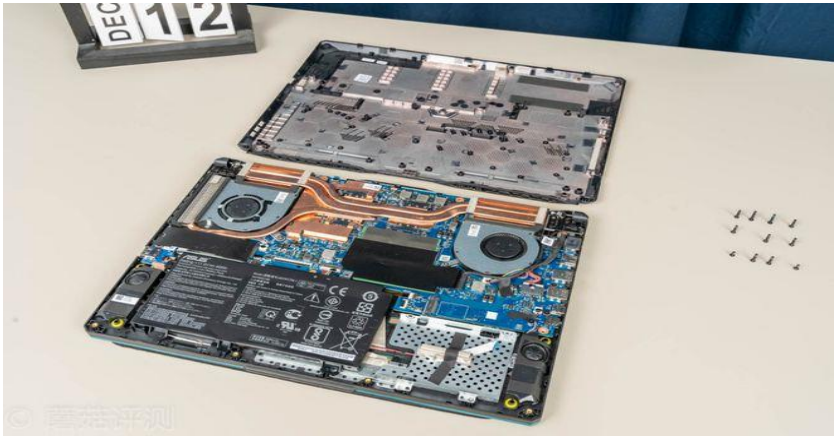

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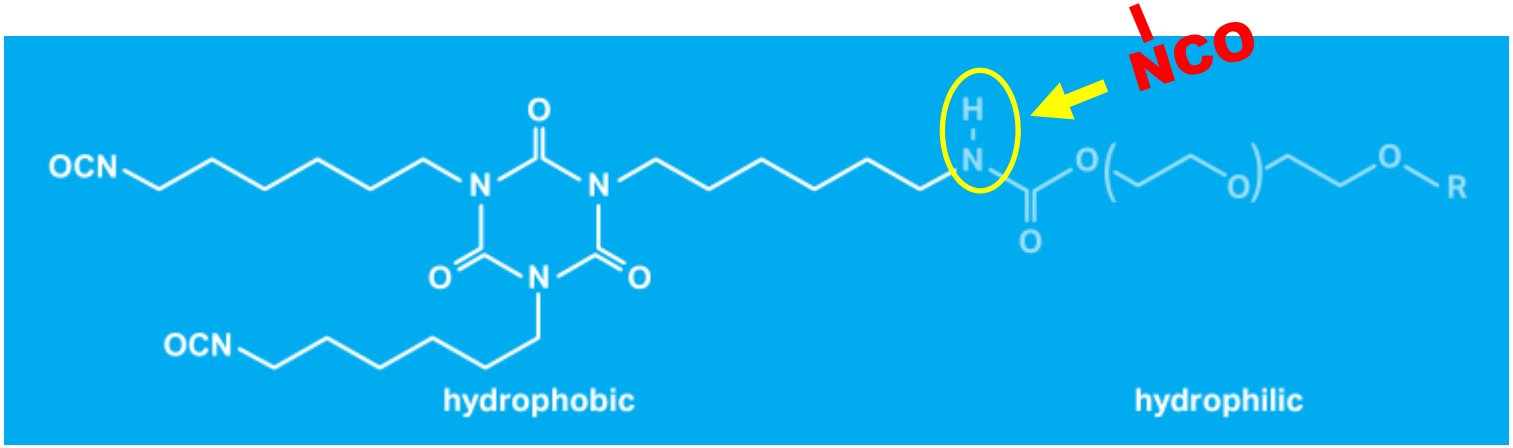
CUCAT-U2 Apply in Synthesizing Waterborne Trimer

Targeting

U2 Catalyzes Targetedly to Generate Allophanate and Biuret

Targeted to catalyze branching reaction of specific active hydrogen and isocyanate, increasing the functionality and reducing the viscosity of trimer, which can significantly improve the water resistance, chemical resistance, scratch resistance, gloss, fullness and other characteristics of dry film.

Other applications need to be further developed.....



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Targeting

CUCAT-G5A Apply in Synthesizing TDI Hardner

G5A Catalyzes Targetedly to self-polymerization of Isocyanates

G5A is trimerization catalyst，which can significantly reduce the free TDI content used in synthesizing TDI hardner and keeps colorless transparent appearance and storage stability.

CUCAT-V Series Apply in Sports Runway

Zero-TVOC

Extremely low TVOC, to meet the requirements of national standard (GB36246-2018)

CUCAT-V18 CUCAT-V17

- Participate in Reaction
- High Boiling Point
- Non-deactivation

Triple-Guarantee to Ensure Zero-TVOC

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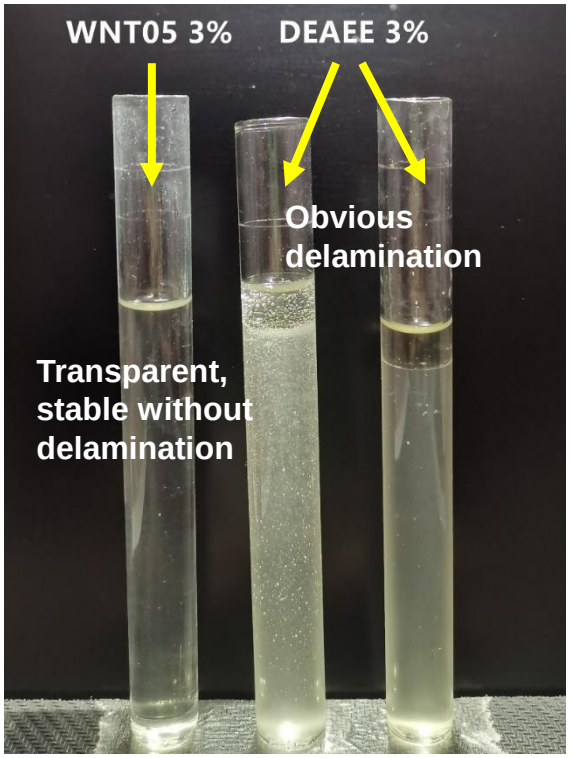
CUCAT-WN Series Apply in Inorganic Grouting Materials

High Compatibility

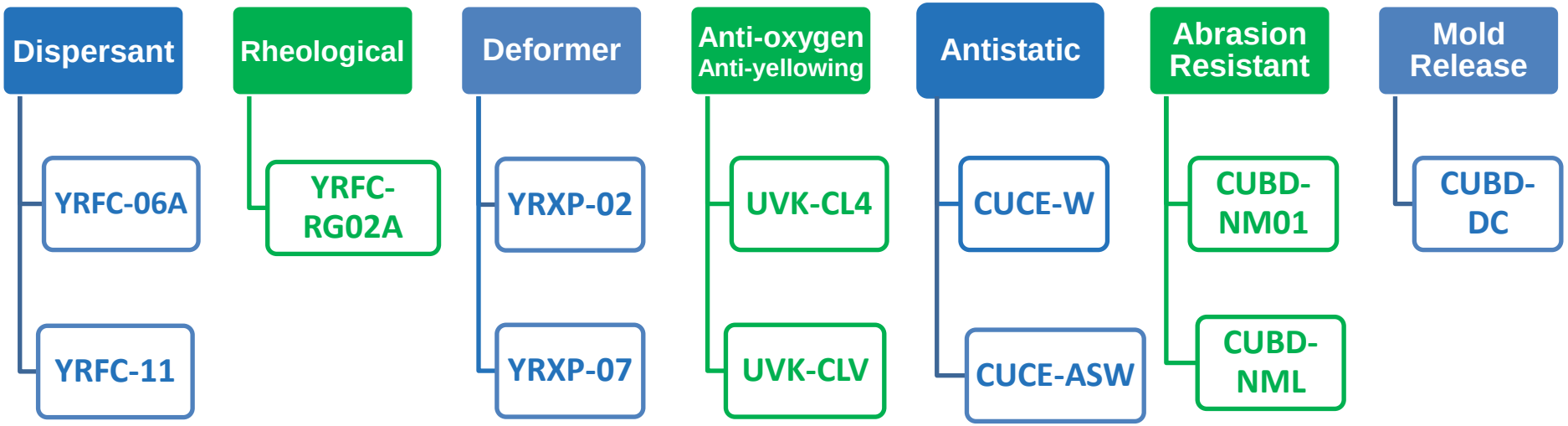
WN series innovative catalysts for Polyurethane-Sodium Silicate Grouting Materials.

- Low odor
- Stable without deactivation
- High compatibility with sodium silicate
- High molding strength



The compatibility comparison of WNT05 and DMAEE in sodium silicate.

Functional Agent



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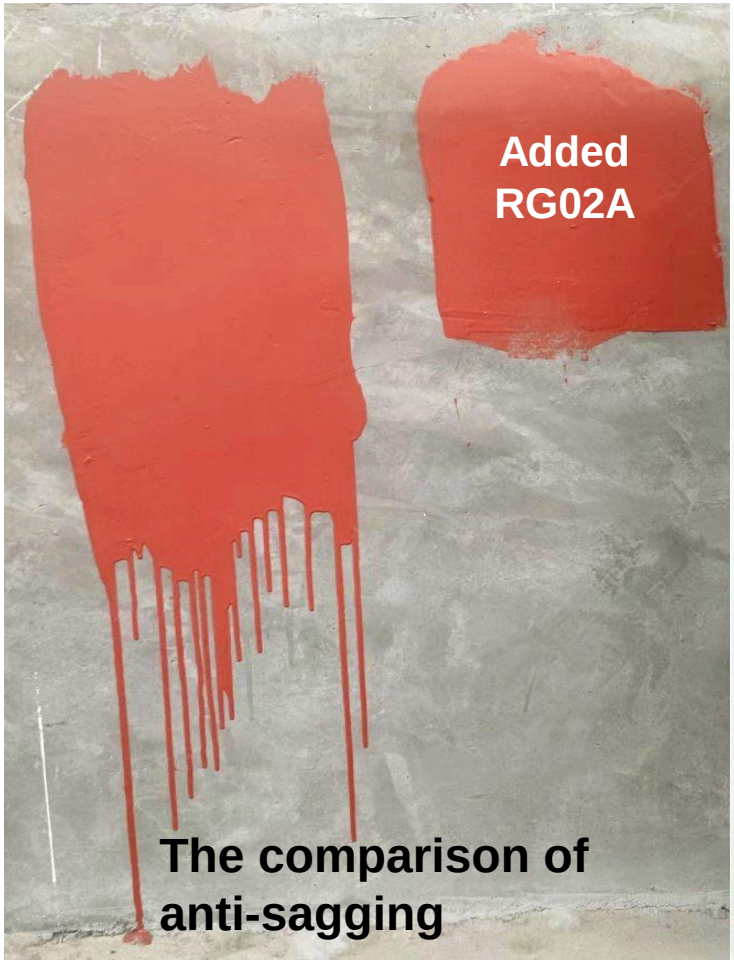
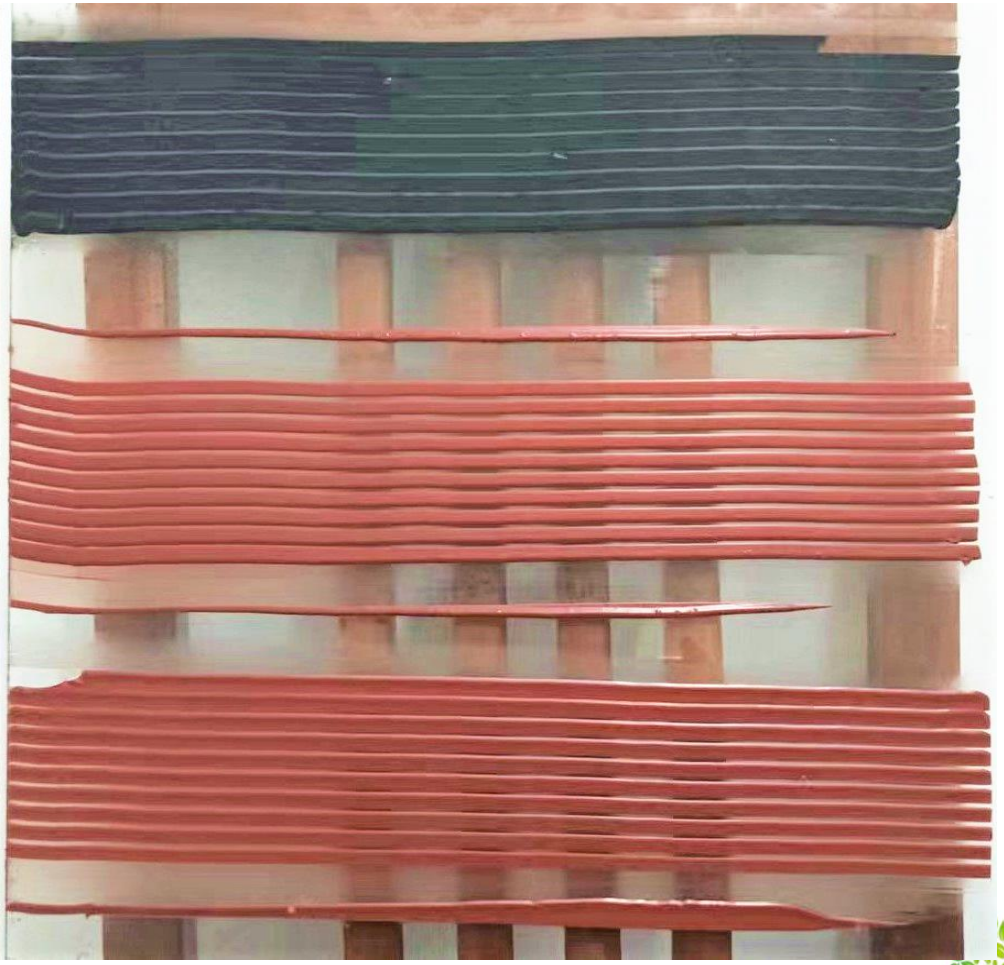
Functional Agent: Rheological

Anti-Sagging

YRFC-RG02A is a high-efficiency liquid rheological agent for anti-sagging coatings.





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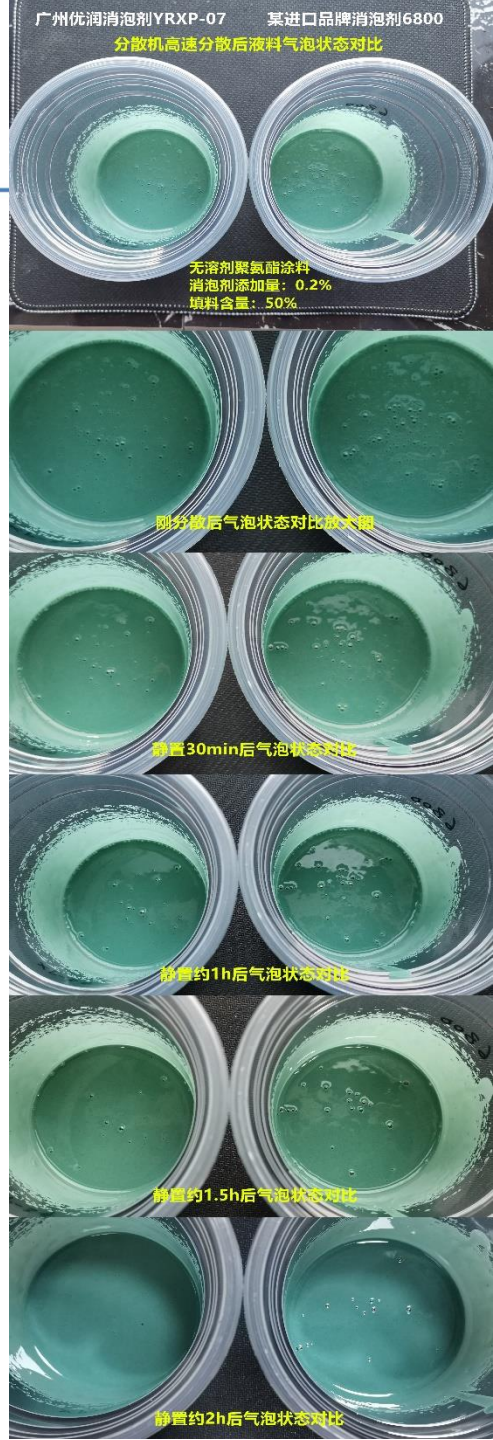
Functional Agent: Defoamer

High Efficiency Defoaming

Defoamer YRXP-07

- **Excellent retard foaming effect:** To possess excellent ability to retard foaming caused by dynamic factors such as mixing and impact.
- **Excellent foam-breaking effect:** Strong foam-breaking effect for the generated foam, to eliminate microbubbles and large-bubbles quickly in various viscosity systems.
- **Less dosage and lower cost.**



Functional Agent: Dispersant

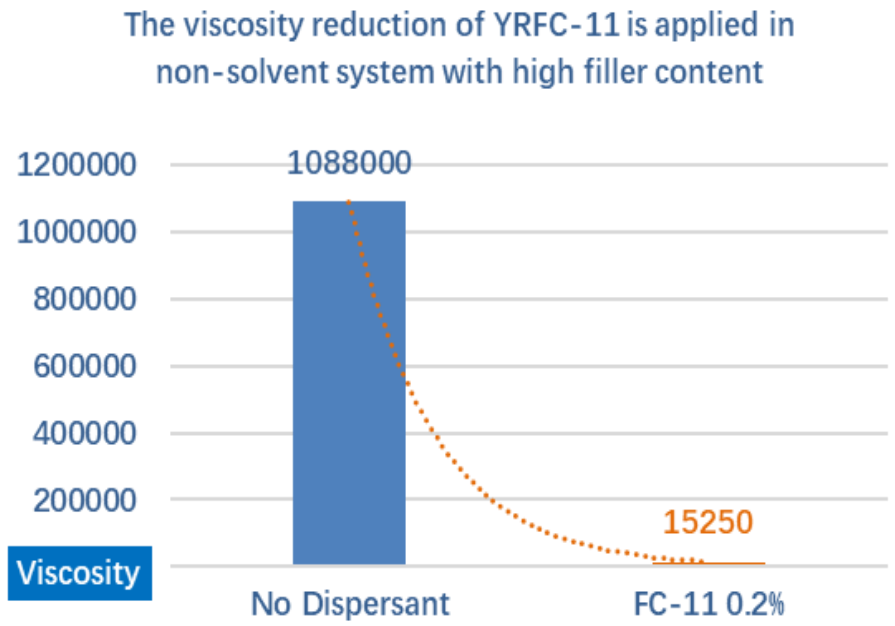
Reducing Viscosity Significantly

High Efficiency Dispersant YRFC-11

YRFC-11 is a high effective dispersant designed for non-solvent system with high fillers content.

The applying properties are following:

- **The viscosity reduction effect is obviously. The system viscosity can be reduced about 70% by small dosage.**
- **Anti-sediment & Anti-agglomeration.**
- **Excellent flowability, to reduce the surface defects of bubbles, bulging and cratering.**



Filler content: 60%

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Functional Agent: Special Adhesive

Bonding for Nylon substrate and CPU: CUBD-NL07

Bonding for Metal substrate and CPU: CUBD-6

- To provide structural firm bonding
- Long potlife, convenient process
- Excellent resistance of water and saline water
- Competitive price

Main Application

- Sports runway and basketball courts
- Waterproof coatings
- Floor coatings

Main Application

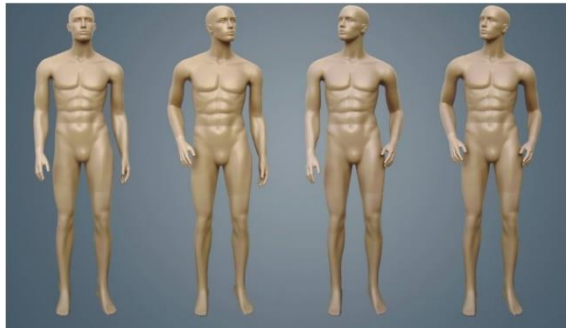
- Spray polyurethane-urea
- high-rate damping PU
- Railway ballast PU

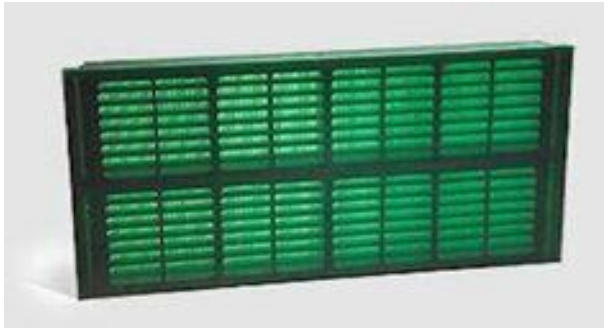
Main Application

- **Grouting and Leaking Stoppage for coal mines**
- **Dam leakage-prevention**

Main Application

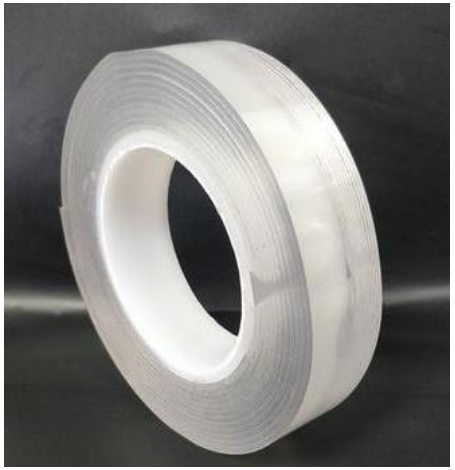
- Wheels, rollers
- Printing Scraper
- Rotating Model
- Hydrocyclones
- Dumbbell glue covered PU
- Mine Screen
- ……





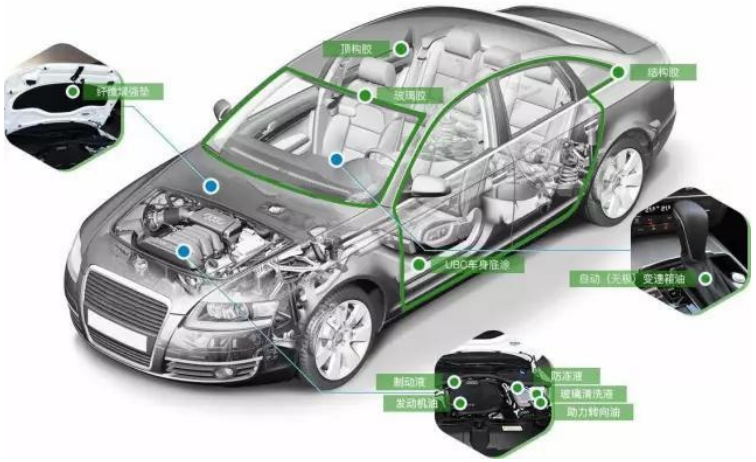
Main Application

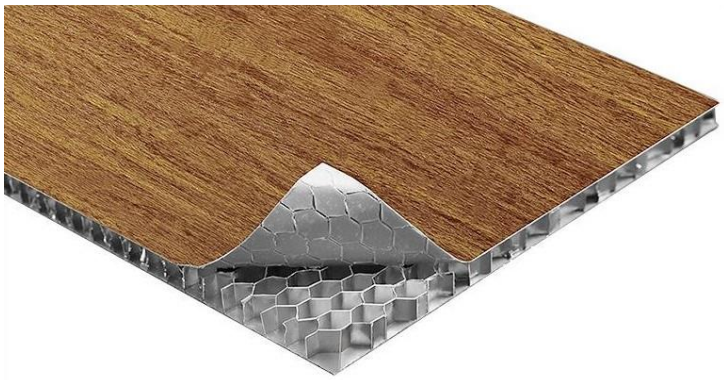
- **Soft PU**
  - ✓ Cold pillow
  - ✓ Mattress
  - ✓ Flexible tape
  - ✓ Mouse pad
  - ✓ ……



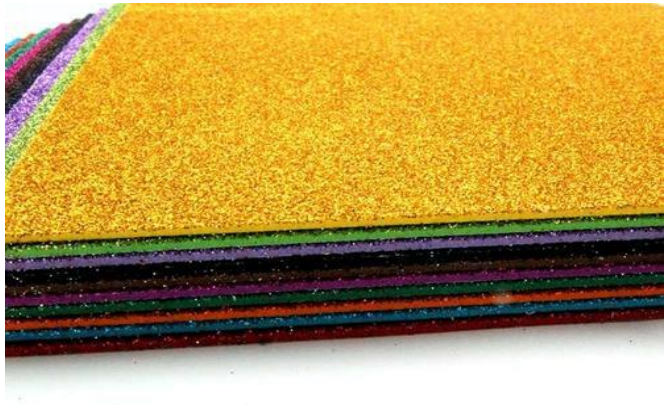
Main Application

- **Adhesive & Sealant**
  - ✓ Structural adhesive
  - ✓ Aluminum honeycomb door panel adhesive
  - ✓ Electric vehicle traction-batter PACK
  - ✓ Vehicle adhesive

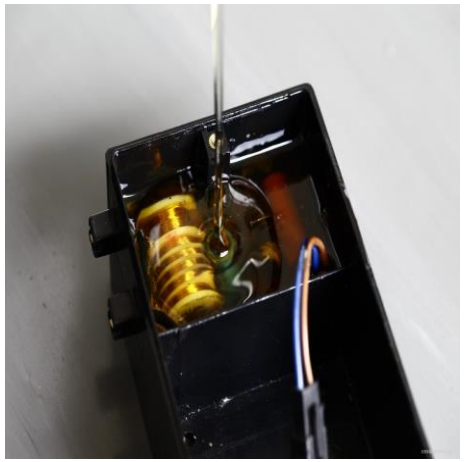




Main Application



- **Adhesive & Sealant**
  - ✓ Electronic encapsulating
  - ✓ Insulating coatings
  - ✓ Lamp strip covered PU
  - ✓ Carpet back glue
  - ✓ PUR

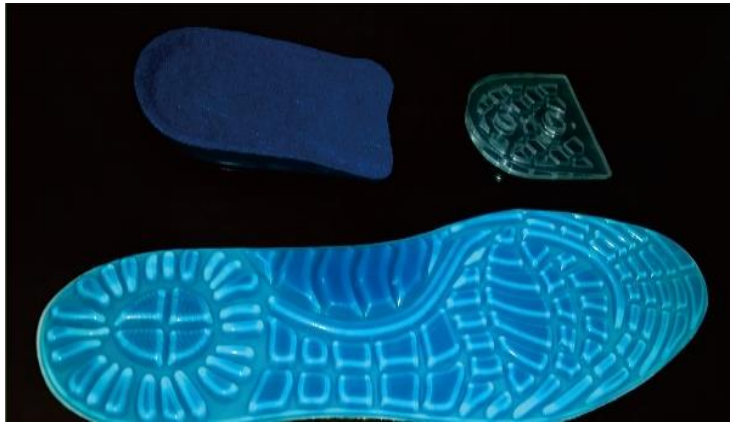


Main Application

- **Adhesive & Sealant**
  - ✓ MS sealant
  - ✓ Building sealant
  - ✓ Automobile sealant
  - ✓ ……

Main Application

- **Shoe Material**
  - ✓ Shoe Upper
  - ✓ Shoe-pad
  - ✓ Soles
  - ✓ Shoe glue



Main Application

➢ PU Leather

- ✓ Non-solvent PU materials
- ✓ Solvent base PU leather resins
- ✓ Waterborne leather coatings

Main Application

Synthetic Polyurethane Resin

- ✓ PUD
- ✓ Solvent base PU resins
- ✓ TPU
- ✓ Isocyanate Hardner

Main Application

Coatings:

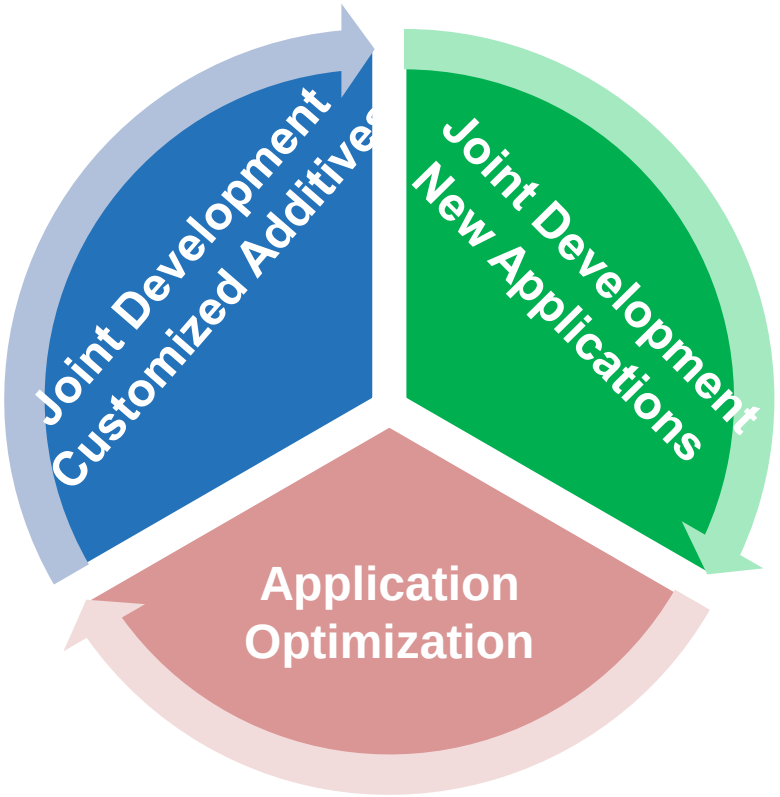
- 2K polyester PU coatings
- 2K hydroxyacrylic coatings
- Alkyd paint
- Moisture curing PU coatings

Such as wood coatings, automotive repair coatings, anticorrosive paint, scribing paint, tank iron paint, building floor coatings, etc.

3 Services & Cooperations

Technology Application Services

Relying on the professional advantages and rich experiences on the polyurethane industry, we provide customers with high-quality and differentiated technical solutions through innovative catalysts and functional additives.



Cooperations

替代有机汞铅锡 聚氨酯环保催化剂

Substitutes for Organo-Mercury/Lead/Tin Eco-Friendly Polyurethane Catalysts

Thanks!

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