

## Application of Catalyst and Additive in waterproof coating & floor coating

### 1. Spray Polyurea (Polyurethane Urea)

Recommended products: CUCAT-HA02, organic bismuth BCAT-E16, etc

Compared with the general organic bismuth 8118, HA02 has the stronger characteristics of target and non foaming, and high activity at low temperature.

- ◆ Effectively avoid foaming and bulging, the colloid is dense without bubbles and the strength is higher. It improves the adhesion fastness between the coating and the base surface. Compared with organic bismuth, it can effectively avoid the reaction between water and isocyanate, and greatly reduce the influence of wet substrate and water vapor on the coating under high temperature and high humidity conditions, which avoid the occurrence of hollowing and peeling caused by air bubbles at the bonding interface.
- ◆ The curing is faster than organic bismuth at low temperature, which is more suitable for winter construction. Compared with organic bismuth, HA02 maintains higher catalytic activity in a wider temperature range.
- ◆ It has better anti-aging effect than organic bismuth. HA02 has better aging resistance than organic bismuth.
- ◆ The formula is flexible in material selection and reduces the cost. It has higher catalytic activity than organic bismuth, and allows more PPG to be used in the formula and reduces the use of expensive amine ethers and aromatic amines (DETD/ E100). Even if MOCA + PPG is used as active hydrogen component, it will not produce undesirable phenomena such as foaming and bulging.



### 2. Polyurethane Waterproof Coating

- ◆ Solve the problems of bulge, bubble and pinhole of single and two-component waterproof coating, and improve the physical properties; Solve the problem of slow curing at low temperature.

#### 2.1 Two Component Waterproof Coating

Recommended products: AUCAT-F1/F2, CUCAT-PD

Reducing VOC in waterproof coatings to zero is the inevitable trend of industry development. However, reducing or not using solvents at all is bound to greatly increase the viscosity of the material system. High viscosity will not only increase the construction difficulty, but also have problems such as poor flowability, thick coating, more bubbles, etc. Therefore, one of the key technologies of solvent-free coatings is how to reduce the viscosity. In addition to the redesign of formula and the reselection of various main raw materials, the applicability of various additives must also be re evaluated and selected. For example, the polarity of solvent is one of the factors affecting the reaction speed. Reducing solvent will shorten the pot life of construction, reducing catalyst will extend the pot life, but the coating will not cure.

AUCAT-F1/F2 is an eco-friendly catalyst developed according to the process characteristics of solvent-free two-component waterproof coating, with the following characteristics:

- ◆ Extend the flow time but shorten the curing time. F1 has high catalytic activity, and the viscosity and strength of the coating increase rapidly at the initial stage. F2 has mild catalytic activity, has little effect on viscosity increasing, and promotes the curing of the coating. Through the different proportion of F1 / F2, the construction pot life and curing speed can be flexibly adjusted. This characteristic is very important for the design of solvent-free formula.
- ◆ Avoid foaming, bulging and peeling. The PU is dense without foam and more waterproof. It has the unique characteristic of not catalyzing the reaction between trace water and isocyanate, which avoids the problems of bubbling, bulging and peeling caused by tin (T-12 dibutyltin dilaurate) catalyst under high temperature and high humidity conditions. Improve the adhesion fastness between PU adhesive and base surface, especially wet base surface, and greatly improve the impermeability.
- ◆ The catalytic activity does not decay or fail during storage. Reducing or not using hydrophobic aromatic solvent in solvent-free formula will reduce the hydrolysis stability of traditional catalysts such as organic tin, which may lead to the attenuation and failure of catalysts. The F1 / F2 structure is stable, which can avoid non curing and other accidents caused by catalyst failure.
- ◆ Eco-friendly and does not contain organic tin, so as to reduce the toxicity to workers and the environment, and ensure to meet the stringent requirements of environmental protection regulations at home and abroad. The early PU waterproof coating traditionally used organic tin catalyst T-12, and its toxicity and environmental harm have long been well known. In recent years, many environmental protection laws and regulations at home and abroad have strictly restricted or even banned T-12, which is not suitable for the development and needs of the industry.



#### 2..2 One Component Moisture Curing Waterproof Coating

Recommended products : WCAT-WS2 / Ws8 / WP01

1) Ws2 / WS8 is recommended for aromatic isocyanate moisture curing system and has the following characteristics:

- ◆ It provides sufficient flow time and effectively reduces bubbles and bulges. During construction, the viscosity is low and rises slowly with good leveling. The mechanical bubbles wrapped in the glue and the bubbles generated by the initial reaction can fully overflow, which greatly reduce the pinholes and wrinkles on the surface after curing.
- ◆ The surface and internal curing is fast at low temperature in winter. Especially at low temperature, it has excellent catalytic curing effect in the middle and late stage of curing. General organic tin catalyst T-12 loses catalytic activity at low temperature. WS2 / WS8 still maintained relatively high catalytic activity at low temperature (10 °C) and ambient humidity below 35%, which can effectively shorten the process time of silicon Pu pavement at low temperature and solve the problem of slow curing in winter construction of the industry.

- ◆ Compared with T-12, the synthetic viscosity and storage viscosity are lower. The viscosity of single component formula after synthesis is lower than that of T-12; The viscosity increases little and the stability is better during storage.
  - ◆ Ws8 has higher catalytic activity than WS2 and performs even better in TDI system
- 2) WCAT-WP01 is recommended for non yellowing aliphatic isocyanate moisture curing system. It is super active. Compared with T12, the surface and internal curing time of material can be increased by more than 2 times, the advantages is more obvious at low temperature in winter.

### 3. Polyurethane Floor Coating

After mixing, it has long flow time, no foaming and fast curing.

Recommended catalysts for two component material: CUCAT-FR01, AUCAT-T62, ZCAT-T50

Recommended catalysts for one component material: WCAT-WS2 / Ws8 / WP01, details refer to 2.2

- ◆ The overall characteristics are slow viscosity rise, long pot life and fast curing after mixing.
- ◆ Both T62 and T50 are catalysts for promoting post curing after gelation. Compared with T50, T62 has the characteristics of hydrolysis resistance and better storage stability.
- ◆ T62 and T50 are not sensitive to temperature and still have relatively high catalytic activity at low temperature. It is indispensable for fast curing construction at low temperature in winter.
- ◆ The activity of FR01 is relatively high. Collocates with T50 or T62, the surface curing time and post curing time can be flexibly adjusted.

Attached table: product selection guide for application in waterproof coating and floor coating

Product Name	Model	Recommended Application Field			Property
		Waterproof PU Coating		PU Floor Coating	
		two component	one component		
Catalyst	CUCAT-PD	★★			High activity, insensitive to water and non foaming
	CUCAT-HA01/HA02	☆			Fast gelling and high density.
	CUCAT-HAA	☆			Fast gelling, fast curing, suitable for wet construction.
	CUCAT-DG02				Fast gelling, fast curing, suitable for wet construction.
	CUCAT-FR01			★★	Low mixing viscosity, long pot life and high strength
	AUCAT-F1	★★		☆	High activity, hydrolysis resistance, no foaming
	AUCAT-F2	★★		☆	Rear stage catalysis, quick curing
	WCAT-WS2		★★		Good storage stability and no deactivation at low temperature
	WCAT-WS8		★★		Less addition, good stability and no deactivation at low temperature
	WCAT-WP01		★★		High activity, suitable for moisture curing of aliphatic system
	AUCAT-T62			★★	Long pot life, good leveling, stability and no failure
	ZCAT-T50			★★	Long pot life, good leveling, quick post curing
	BCAT/ZCAT series			☆	General purpose organic bismuth / zinc
Anti-settle Dispersing Agent	YRFC-01	★★	★★	★★	Prevent the bottom of powder barrel from hardening
	YRFC-03	★★	★★	★★	Anti sagging, anti powder settlement and easy dispersion
Viscosity Reducer	YRFC-06A	★★	★★	★★	High efficiency pigment and filler dispersion viscosity reducer, excellent powder sedimentation reduction, good leveling.
Defoaming Agent	YRXP-02				Non silicon defoamer, does not affect interlayer adhesion
	YRXP-06	★★	★★	★★	High efficiency defoamer, excellent foam inhibition and breaking effect.
Water Removing Agent	CUWR-WB20	☆	★	☆	Eliminate the influence of trace moisture in raw materials and reduce the phenomena of bubbles, bulges, hollows, pinholes and so on caused by the reaction of trace moisture with isocyanate to generate CO2.
	CUWR-WB50T	★	★	★	

Meaning of Logo: ★★ — strongly recommended    ★ — recommended    ☆ — usable

The above models are only some of the products in application.