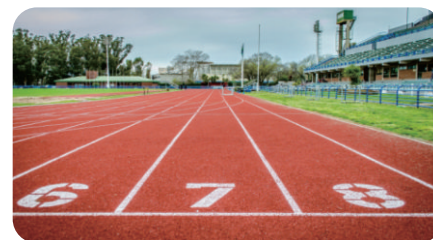


## Catalyst, Chain Extender and Additive for Plastic Runway and Stadium

- Solve the problem of TVOC exceeding the regulated emission standard
- Solve the problem of foaming stability of micro foamed PU
- Solve the problem of slow curing at low temperature
- Solve environmental problems without MOCA
- Solve the problem of slow curing of one component non yellowing polyurethane



### 1. Catalyst for Plastic Runway

#### 1.1 General Purpose Organic Bismuth / Zinc Catalyst

Recommended Products: BCAT-20AP, ZCAT-X16, BX1124, BX2123

- ◆ It has the common characteristics of organic bismuth and zinc: bismuth is of high activity and zinc promotes post curing
- ◆ Comparable to top brand organic bismuth, stable quality, fine control production, no difference in catalytic performance.



#### 1.2 V series catalysts of low TVOC to resolve the TVOC problem

Recommended Products: CUCAT-V17, CUCAT-V18

Two years of market practice after the release of the new national standard GB36246-2018 for the sports floor industry, more and more enterprises have realized that TVOC (total volatile organic compounds) is the main test item that leads to the unqualified test of plastic runway. The research results of Yourun are highly consistent with the big data traceability analysis results of authoritative third-party testing institutions—The main reason for TVOC exceeding the standard is the catalyst.

Yourun V series catalysts are developed especially for the strict requirements of TVOC in the new national standard GB36246-2018. It is fully guaranteed by the two characteristics of high boiling point and reaction, and solves the problem of exceeding the standard of TVOC caused by isooctanoic / neodecanoic acid in organic bismuth / zinc catalysts.

- ◆ The boiling point exceeds the upper limit of TVOC specified in the GB36246-2018 standard, the TVOC of raw materials and finished products will not be increased.
- ◆ V17/V18 are reactive catalysts, which can be grafted into the polymer chain segment and become a part of the polyurethane polymer runway. There is no free state, so it will not increase the TVOC of the plastic runway.
- ◆ V18 is the main catalyst and V17 is the auxiliary catalyst to promote post curing. Reasonable combination of V18 and V17 can ensure sufficient leveling time and moderate curing time.

### 2. Catalyst for Silicon PU: resolve the problems of bubbling and slow curing at low temperature

Recommended Products: WCAT-WS2, WCAT-WS8

- ◆ It provides sufficient flow time and effectively reduces bubbles and bulges. Compared with T-12, the synthetic glue has lower viscosity and is more stable for storage. 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. The excellent feature of promoting the rapid curing of PU at low temperature is applicable not only to silicon PU, but also to the rapid curing of two-component plastic runway at low temperature (below 10 °C) in winter. Only 0.1-0.5% WCAT-WS8 of component B is added to the organic bismuth / zinc of the existing plastic runway, which solves the quality and construction period problems caused by slow / non curing of silicon PU and plastic runway at low temperature in autumn and winter.
- ◆ WS8 has higher catalytic activity than WS2 and performs even better in TDI system

### 3. Catalyst for non yellowing adhesive: solve the problem of slow curing of one-component non yellowing polyurethane

Recommended Products: WCAT-WP01A

- ◆ High activity: compared with T12, the material surface and internal curing time can be increased by more than 2 times.
- ◆ Fast curing at low temperature in winter: when organic tin T-12 is used in non yellowing aliphatic isocyanate glue, it cures slow at high temperature in summer, and will not cure in winter.
- ◆ Eco-friendly: it does not contain high toxic butyl tin, which is more suitable for the pavement of kindergartens, primary schools and other places.

### 4. Catalysts for micro foaming materials: solutions to the problems of foaming stability.

Recommended Products: CUCAT-W11A, CUCAT-HC

- ◆ The catalytic activity is stable and controllable, effectively avoiding uncontrollable violent foaming under high temperature and high humidity conditions. By using the combination of HC and W11 according to the catalytic activity difference between water and isocyanate, the stability and effectiveness of micro foaming reaction under various temperature and humidity conditions are controlled.
- ◆ The pores are fine, uniform and stable. Avoid large bulging and bubble collapse.

## 5. Eco-friendly odorless liquid chain extender: solution to environmental protection problems without MOCA

### Recommended Products: TDMA-02, TDMA-G55

TDMA-02 and TDMA-G55 are eco-friendly liquid chain extenders, which are applicable to the strict requirements of Shanghai Group Standard for plastic runway. They are one of the most cost-effective products in the market at present. The selling price is close to MOCA, and the products have good post curing performance. The features are as follows:

- ◆ The product is non-toxic and the plastic runway is odorless. It does not contain MOCA ingredients and has no special odor of DMTDA (E300), which complies with strict environmental regulations.
- ◆ It is liquid at room temperature and easy to use. It can be well miscible with other raw materials without heating. It is easy to use. Although the viscosity increases at low temperature, it will not crystallize.
- ◆ The activity is moderate and easy for construction. It has lower activity than DMTDA (E300) but higher activity than MOCA. Combined with CUCAT-V series or bismuth zinc drier, the construction time can be more than 40 minutes, and it can be dried in 12 hours, which is convenient for construction.
- ◆ Excellent physical properties, improved hardness, tensile strength and other mechanical indexes. After properly adjusting the formula, the physical properties are equivalent to those of MOCA and DMTDA.
- ◆ G55 has a longer pot life time than 02.

TDMA-02 is used to replace MOCA in two-component plastic runway materials. The physical properties of the materials are as follows:

Material Ratio (Component A : B)	Tensile Strength (Mpa)		Elongation (%)		Shore Hardness (A)
	National Standard	Measured Value	National Standard	Measured Value	Measured Value
1:3	≥ 0.5	1.32	≥ 40	298.56	51
1:5	≥ 0.5	1.13	≥ 40	532.83	45

### Attached table: product selection guide for application in plastic runway and stadium

Product Name	Model	Property	Application	
Catalyst	CUCAT-V17	V series products are specially developed for the strict requirements of TVOC in the new national standard GB36246-2018. The products do not contain isooctanoic and neodecanoic acid. The two characteristics of reaction type and high boiling point fully ensure that the products meet the requirements of TVOC in the new national	Two component materials (fully plastic, mixed and composite runway, two-component silicon PU stadium)	
	CUCAT-V18			
	BCAT-20AP			Organic bismuth eco-friendly catalyst, bismuth metal content: 20% ± 0.5%
	ZCAT-X16			Organic zinc eco-friendly catalyst, zinc metal content: 16% ± 0.5%
	BX1124			Bismuth zinc composite eco-friendly catalyst, organic bismuth: organic zinc = 1:4
	BX2123	Bismuth zinc composite eco-friendly catalyst, organic bismuth: organic zinc = 2:3		
	WCAT-WS2	It does not inactivate at low temperature, solve the disadvantage of slow curing of T-12 material at low temperature. In the low temperature (5 ℃) test, it still maintains a good catalytic effect. The curing time is more than twice shorter than that of T-12. The activity of WS8 is much higher than T-12 in MDI / TDI system, and WS2 is relatively high in MDI system. Good storage stability and relatively low material		One component material (silicon PU, glue)
	WCAT-WS8			
	WCAT-WP01A	Suitable for aliphatic isocyanate anti yellowing glue. The catalytic activity is about 2-3 times that of T12. It has high activity at low temperature and significant advantages in winter construction.		Anti-yellowing adhesive
	CUCAT-HC	Suitable for micro foaming playground materials. The two collocates freely (generally HC: W11A = 3 ~ 1.5: 1) to flexibly adjust the foaming ratio, so as to provide stable and controllable fine, uniform and flat microbubble effect, and effectively avoid violent foaming and large bulging.		One or two component micro foaming material
CUCAT-W11A				
Chain Extender	TDMA-02	The calculated equivalent is the same as MOCA, eco-friendly, MOCA free, low odor, liquid at room temperature, good mutual solubility with other raw materials without heating, fast curing and good flexibility of finished products. It can also be used for TDI and MDI silicon PU materials. Directly adding 1% - 2% into silicon PU materials can realize no foaming when the thickness of one construction exceeds 10mm.	Plastic runway, Silicon PU	
	TDMA-G55			
Defoaming Agent	YRXP-06	High efficiency defoaming, suitable for mixing defoaming during runway / silicon PU production and static defoaming after paving.	Plastic runway, Silicon PU	
Anti-settle Dispersing Agent	YRFC-03S	Colorless liquid, which can be dispersed and adsorbed on the surface of a large number of powder particles by adding a very small amount. It effectively reduces the adsorption between powder particles, to achieve the purpose of preventing powder from settling and hardening at the bottom of the barrel.		
Viscosity Reducer	YRFC-06A	High efficiency dispersion viscosity reducer, excellent powder dispersion, significantly reduce the system viscosity, prevent powder from settling and hardening at the bottom of the barrel, improve leveling, reduce the bubble problem caused by the difficult discharge of air in small holes common in the construction of concave convex base, increase the powder dosage and reduce		