

Tingco

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TIANJIN TINGCO TECH CO., LTD

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www.tcfibers.com



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CBAM (Carbon Border Adjustment Mechanism)

01 COMPANY PROFILE

We are more than just a steel fiber supplier. Backed by our dedicated R&D and technical teams, we have expanded our product line to include PP fibers, PA fibers, and our latest innovation - UHPC premix, responding to market demands and clients' needs for diversified solutions.





TINGCO VALUES

Deliver value to our enterprise, Create value for our customers.

With sincerity, resilience, optimism, initiative, continuous learning, and gratitude.



TINGCO VISION

To become a trusted and progressive enterprise that evolves with the times.



TINGCO MISSION

People-oriented, eco-friendly innovation for civil engineering development.

02

PRODUCT PORTFOLIO

Copper Coated
Micro Steel Fiber

Stainless Micro
Steel Fiber

Hooked End
Steel Fiber

PP
Micro Fibers

PP
Macro Fibers

UHPC Premix
Concrete

COPPER COATED
MICRO STEEL FIBER ➡

⊗ **Type** Straight

⌀ **Product Range**
Diameter: 0.16mm-0.32mm
Length: 6mm-25mm
T/S: 2400-3050MPa



⌚ **Popular Spec**

Diameter	Length	Tensile strength
0.16 mm	6 mm	3000 MPa
0.20 mm	13 mm	>2850 MPa
0.20 mm	20 mm	>2850 MPa

⊗ **Type** Hooked End

⌀ **Product Range**
Diameter: 0.16mm-0.32mm
Length: 6mm-25mm
T/S: 2400-3050MPa



⌚ **Popular Spec**

Diameter	Length	Tensile strength
0.20 mm	13 mm	>2850 MPa

STAINLESS MICRO STEEL FIBER

 **TYPE** Straight

 **Popular Spec**

Diameter	Length	Tensile strength
0.20 mm	13 mm	2200 MPa
0.20 mm	20 mm	2200 MPa

 **TYPE** Hooked End

 **Popular Spec**

Diameter	Length	Tensile strength
0.20 mm	13 mm	2200 MPa



HOOKED END STEEL FIBER

 **Type** Loose

 **Product Range**

Diameter: 0.5mm-1.0mm

Length: 25mm-60mm

T/S: 1100MPa, 1300MPa, 1900MPa, 2100MPa



 **Popular Spec**

Diameter	Length	Tensile strength
1.0 mm	50 mm	1100 MPa
1.0 mm	50 mm	1400 MPa
0.70 mm	50 mm	1225 MPa
0.75 mm	50 mm	1225 MPa
0.75 mm	50 mm	2100 MPa
0.90 mm	60 mm	1100 MPa
0.90 mm	60 mm	2100 MPa

Type **Glued**

Product Range

Diameter: 0.5mm-1.0mm
Length: 25mm-60mm
T/S: 1100MPa, 1300MPa, 1900MPa, 2100MPa



Popular Spec

Diameter	Length	Tensile strength	fr1	fr2	fr3	fr4
0.55 mm	35 mm	1300 MPa	3.2	3.1	2.87	2.58
0.75 mm	60 mm	1225 MPa,	2.99	3.16	3.33	3.25
0.75 mm	60 mm	2100 MPa	5.52	7.71	8.29	8.02
0.90 mm	60 mm	1900MPa	4.38	6.32	6.68	6.49

PP MICRO FIBER

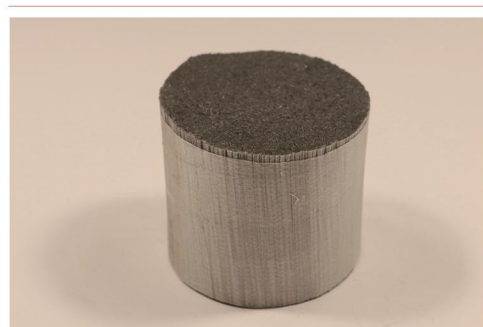
Material	Raw polypropylene
Diameter	18/30μm
Length	6/12/18 mm or Customize
Specific Gravity	0.91g/cm³

Tensile strength	450 MPa
Melting Point	165℃
Moisture	<0.1%



PP Macro Fibers

Material	Raw polypropylene
Diameter	0.7-0.9mm
Length	38/50 mm or Customize
Specific Gravity	0.91g/cm³
Tensile strength	>600 MPa
Melting Point	165℃
Moisture	<0.1%



PP Twisted Fibers

Material	Raw polypropylene
Diameter	0.3-0.5mm
Length	25/54 mm or customize
Specific Gravity	0.91g/cm³
Tensile strength	>600 MPa
Color	White/Grey/Black



NEWLY LAUNCHED PRODUCT — UHPC PREMIX

Product Features

Items	Characteristics
Premix	White, Composed of cement, admixtures, sand and additives
Fiber	Stainless steel fiber, 13mm in length, 0.2mm in diameter
Superplasticizer	Translucent liquid
Recommended water to Material ratio	0.08-0.09

Main technical indicators of UHPC (28d standard curing)

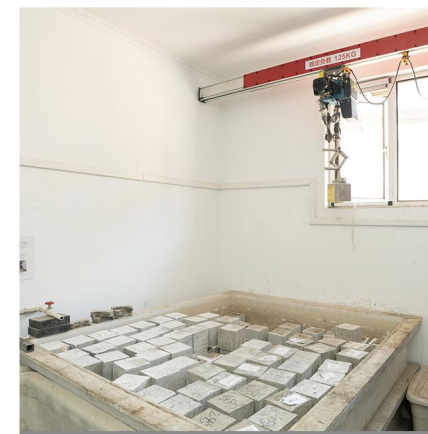
Items	Performance Index	Items	Performance Index
Spread value/mm	650-700	Flexural strength /MPa	≥20.0
Compressive Strength/MPa	≥120.0	Shrinkage/μE	≤300
Tensile strength/MPa	≥9.0	Chloride ion diffusion coefficient/10-12(m2/s)	≤0.1
Elastic Modulus/Gpa	45.0-50.0	Freeze-thaw cycles/Times	≥500

Application Method and Matters Needing Attention

Materials	Premix	SP	Fiber	Water
Dosage	1000kg	8-10kg	60-100kg	85-90kg

03 LABORATORY FACILITIES

Standard EN14651
ASTMC1609



Test specimen: Beam with steel fiber (Ductil) No.2
Specimen information: Length = 600 mm, Width = 149 mm, Height = 150 mm
Span length (L): 500 mm
Date of testing: 5 February 2020
Age of sample at testing: 27 days

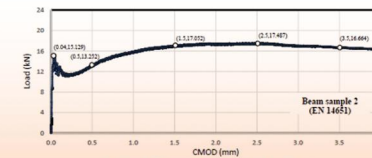


Figure 5: Relationship between load and CMOD

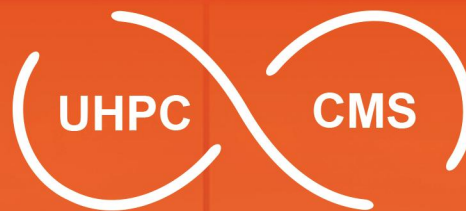
Table 2: The properties of the sample

CMOD ₁	0.05 mm	F ₁	15.120 N	LOP	4.95 MPa
CMOD ₂	0.50 mm	F ₂	13.252 N	f _{B,1}	4.33 MPa
CMOD ₃	1.50 mm	F ₃	17.052 N	f _{B,2}	5.58 MPa
CMOD ₄	2.50 mm	F ₄	17.487 N	f _{B,3}	5.72 MPa
CMOD ₅	3.50 mm	F ₅	16.664 N	f _{B,4}	5.46 MPa

04 CERTIFICATIONS



05 TECHNICAL TEAM



UHPC

TECHNICAL EXPERT

VICTOR YANG

Senior Engineer (Research Professor level)

Industrial Professor at Nantong University

Yang Zhiqian is a Senior Engineer (Research Professor level) and Industrial Professor at Nantong University, specializing in engineering fibers and ultra-high-performance cement-based composites (UHPC). He is a member of the American Concrete Institute and the Jiangsu Society for Composite Materials.

With extensive expertise in UHPC technology, Professor Yang has led key national research projects, including initiatives under the National Natural Science Foundation of China. His work has contributed to the successful application of UHPC in landmark structures, such as the Xiamen New Convention Center and the Jiangyin Guoyue Island Concert Hall.

Professor Yang's achievements have been recognized with prestigious honors, including the Jiangsu Provincial Science and Technology First Prize and the Jianhua Engineering Award. He has published over 30 research papers, including 10 indexed in SCI/EI journals, filed 36 patents (22 granted), and played an active role in the development of UHPC industry standards.


Project Name:

Pingtung Wangye Boat Cultural Center, Taiwan


Steel Fiber Specifications:

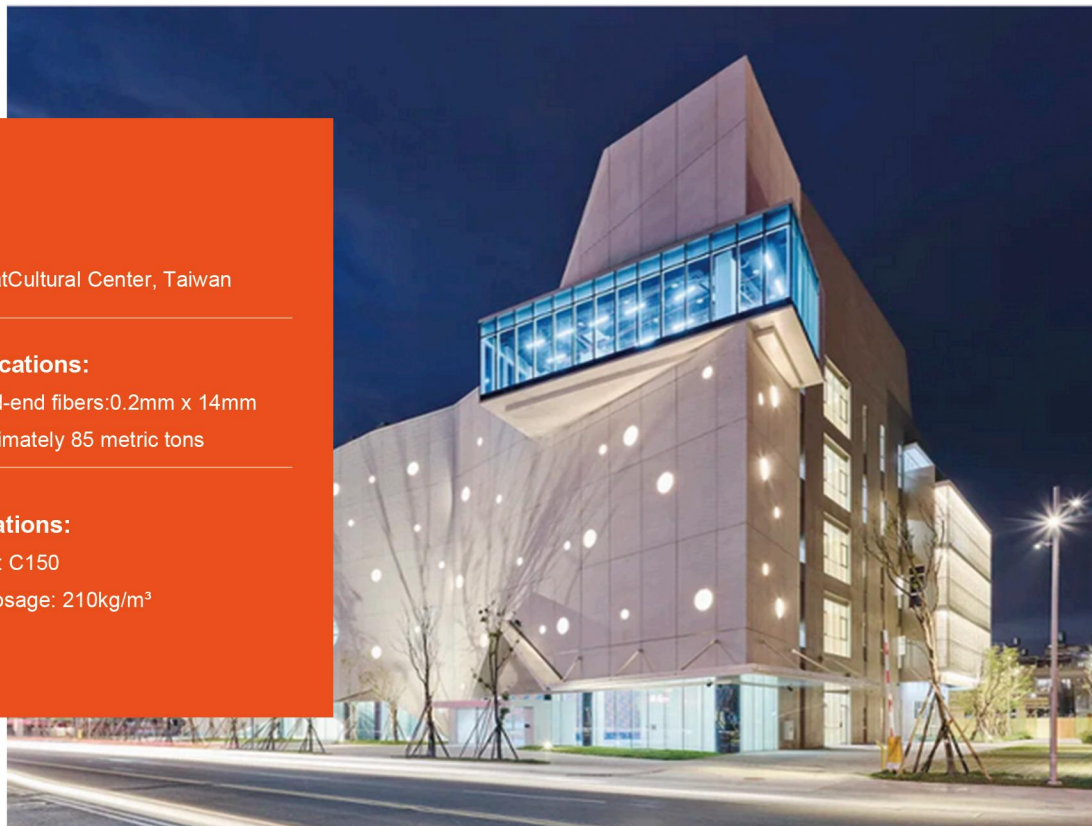
Stainless steel hooked-end fibers: 0.2mm x 14mm

Total quantity: Approximately 85 metric tons


Concrete Specifications:

Compressive strength: C150

Stainless steel fiber dosage: 210kg/m³


Project Case:

Galaxy Hotel Dome Structure, Macau (Integrated Structural and Decorative Design)


Steel Fiber Specifications:

Type: Stainless Steel Hooked-End Fiber

Dimensions: 0.2 mm(diameter)x 14 mm(length)

Total Quantity: Approximately 60 metric tons

Stainless Steel Fiber Dosage: 210 kg/m


Concrete Specifications:

Concrete Strength Grade: C150

CMS

TECHNICAL TEAM

CMS has been well recognized as a specialist for the industrial floor construction and engineering materials.

Our expertise can be proved by our excellent records of full support of engineering design services and supervisions at the jobsite to our customers.



CMS

TECHNICAL TEAM

CMS's in house design program.They design base on TR.344th Edition and reliable international standard.

Their design parameters come from the actual testing results that specified in the design guideline

Project name: T.088 HW (Packaging, Power Supply, Utilities)
 Customer: T. Transilvania
 Design Update: 11.01.21

This document shall not change the mechanical properties (PMS) and shall be valid regardless to TEMA 4th edition.

5. PLE ARRANGEMENT

Dimensioned by PMS

Width of pipe	$B_1 = 300$ mm	
Length with pipe cap	$B_2 = 900$ mm	not required if none of width of pipe
Maximum width of pipe cap	$B_3 = 600$ mm	not required if none of width of pipe
Spacing width of pipe on beam	$B^* = 150$ mm	justified if $B^* \geq 2 \times \text{flange}$

Center-to-center gaps

Longer interstitial gaps	$L_{inter1} = 2.00$ m
Shorter interstitial gaps	$L_{inter2} = 2.80$ m
Longer perimeter gaps	$L_{perim1} = 3.00$ m
Shorter perimeter gaps	$L_{perim2} = 2.80$ m

Effective gaps

Longer interstitial gaps	$L_{inter1} = 2.27$ m	$L_{eff} \geq 1.5 \times B_1$
Shorter interstitial gaps	$L_{inter2} = 2.00$ m	$L_{eff} \geq 1.5 \times B_1$
Longer perimeter gaps	$L_{perim1} = 2.04$ m	$L_{eff} \geq 1.5 \times B_1$
Shorter perimeter gaps	$L_{perim2} = 2.28$ m	$L_{eff} \geq 1.5 \times B_1$

Steel vessel

Thickness of steel (perimeter gap)	$P_{steel} = 200$ mm	
Thickness of steel (interval gap)	$P_{steel} = 180$ mm	$P \geq 10 \times t$
Thickness of steel (perimeter gap)	$P_{steel} = 200$ mm	
Effective depth (perimeter gap)	$P_{steel} = 172.6$ mm	$P \geq 10 \times t$

Project name: 10-668 [Packaging, Power, Signals, ...]
 Design number: 10-668-01
 Design update: 11-01-21

CMV **DÜCTIL**

This document contains all details of non-confidential content (NC) and/or partially before registration in TEAM 4th edition.

Scope of Applicability

A design of the non-confidential content (NC) cannot be used without our written consent.

Designs of parts and their assemblies cannot be used without our written consent.

This document starts with a table of the specified parts and materials.

Missing parts of our assemblies have to be checked with the material list in 10-668-01.

Technical details of parts are not available for the materials of the NC.

Full Design Report

II	A. MATERIAL PROPERTIES	
	Characteristic compressive strength	$f_{ck} = 35 \text{ MPa}$
	Standard deviation	
	Specimen length	DUCTIL PLUS 76 S3
	Tensile strength	$f_{tk} = 2000 \text{ MPa}$

III	B. DESIGN PARAMETERS	
	Load	
	Superimposed Deadload	$DL = 0.00 \text{ kN/m}^2$
	Live Load	$LL = 20.00 \text{ kN/m}^2$
	Uniform Uniform Load	$UL = 0.16 \text{ kN/m}^2$
	Wind Load	$W_d = 10.00 \text{ kN/m}^2$
	Wind Load	$W_s = 10.00 \text{ kN/m}^2$
	Uniform Moment due to SHM	$M = 6.00 \text{ kNm}$

Minimum design loads

Larger internal gap?

Shofter internal gap?

Parameter q_{10}

Width of ULS gap

Normal size of IP gap

$f_{td} = 3.50 \text{ MPa}$

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II	A. SLAB THICKNESS	
	Internal gap	Thickness = 200 mm
	Parameter h	Thickness = 200 mm

III	C. DESIGN SUMMARY	
	Design Items	Requirement Capacity Check
	Capacity against Factored Wind Load (ULS)	68.0 68.28 OK
	Capacity against Factored Wind Load (ULS)	14.0 14.16 OK
	Capacity against Factored Wind Load (ULS)	280.0 770.39 OK
	Capacity against Factored Wind Load (ULS)	10.0 10.12 OK
	Capacity against Factored	

Project name: 3D-600 W (Packaging, Power Supply, Validation)
 Customer: Lamspeed
 Storage Upgraded: 10-01-2015

CMV **DAUTH**
 CONSTRUCTION MANAGEMENT & VERIFICATION

This document shows final design of these structural elements (CPD) after all safety before acceptance in 19304-07 edition.

4. LOADS

Uniformly distributed Load (UDL)

- Self-weight of slab
- Superimposed dead load
- Live load
- Total load in parking condition
- Factored load

W_{SL}	=	5.47	kN/m ²
UDL	=	0.00	kN/m ²
LL	=	20.00	kN/m ²
W_{TL}	=	35.47	kN/m ²
W_{TL}^*	=	53.84	kN/m ²

Racking System/Loading

- Load per sq. ft. of racking
- Factored load per sq. ft.
- Clear total width (ft.)
- Track width (in.)
- Back-to-back distance
- Angle width

P_1	=	10.00	kN/sq
P_{1*}	=	15.00	kN/sq
L_1	=	2.45	m
W_1	=	1.35	m
B_1	=	0.30	m
A_1	=	2.00	m

should be larger than Track width

RME Loads

- Weight when raised
- Factored RME load
- Reaction between floor and rear orbit
- Spine between wheel
- Dynamic equilibrium factor

P_r	=	30.00	N
P_{r*}	=	45.00	N
R_r	=	1.80	m
W_r	=	1.15	m
F_r	=	1.40	

All loads applied on front orbit

"Clear width in rear orbit" > value on "Track width"

Ticon Industrial Connection PCL.

TPARK Warehouse 331 Thailand, Chonburi

Facility Type: Ware House

Floor Area: 37,500m²

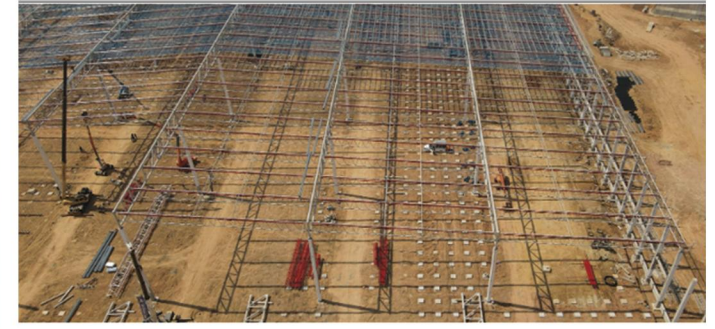


Took Dee Distribution Center Khon Kaen.

Thailand, Khon Kaen (North-East)

Facility Type: Ware House

Floor Area: 66,000m²



06 PROJECT CASES



Gansu Lanzhou Yellow River Bridge Project - Bridge Deck Precast Components



Steel Fiber Specifications:

- Copper-coated straight steel fibers: 0.2mm x 13mm
- Fiber dosage: 200 kg/m³
- Procurement quantity: 230 metric tons



Concrete Specifications:

- Concrete Compressive strength: C130



Novo Nordisk (Tianjin) Slab on Pile flooring

 **Steel Fiber :**
80/60 2100MPa

 **Dosage:**
30kg/m³ Total

 **Thickness:**
250mm, C30

 **Total Uniform Load Design Value:**
79kN/m²



Hangzhou Subway, Tunnel Segment

 **Steel Fiber:**
80/60 2100MPa (Glued)
65/50 2100MPa (Loose)

 **Dosage:**
40kg/m³ Total



07 CBAM

(Carbon Border Adjustment Mechanism)



2 Summary of the production processes, included precursors and production routes, where relevant

(a) Aggregated good produced	Routes	Route 1	Route 2	Route 3	Route 4	Route 5	Route 6	(c) Purchased precursor	Aggregated goods category	Route 1	Route 2	Route 3	Route 4	Route 5	Country code
G1 Iron or steel products	All production routes	All production routes						P1 Wire rod	Iron or steel products						CN
G2								P2							
G3								P3							
G4								P4							
G5								P5							
G6								P6							
G7								P7							
G8								P8							
G9								P9							
G10								P10							
								P11							
								P12							
								P13							
								P14							
								P15							
								P16							
								P17							
								P18							
								P19							
								P20							

Table: Process stages and EPD modules,

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFIT AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Production	Transport from the gate to the	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction /demolition	Transport	Waste processing	Disposal	reuse-recovery-recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X