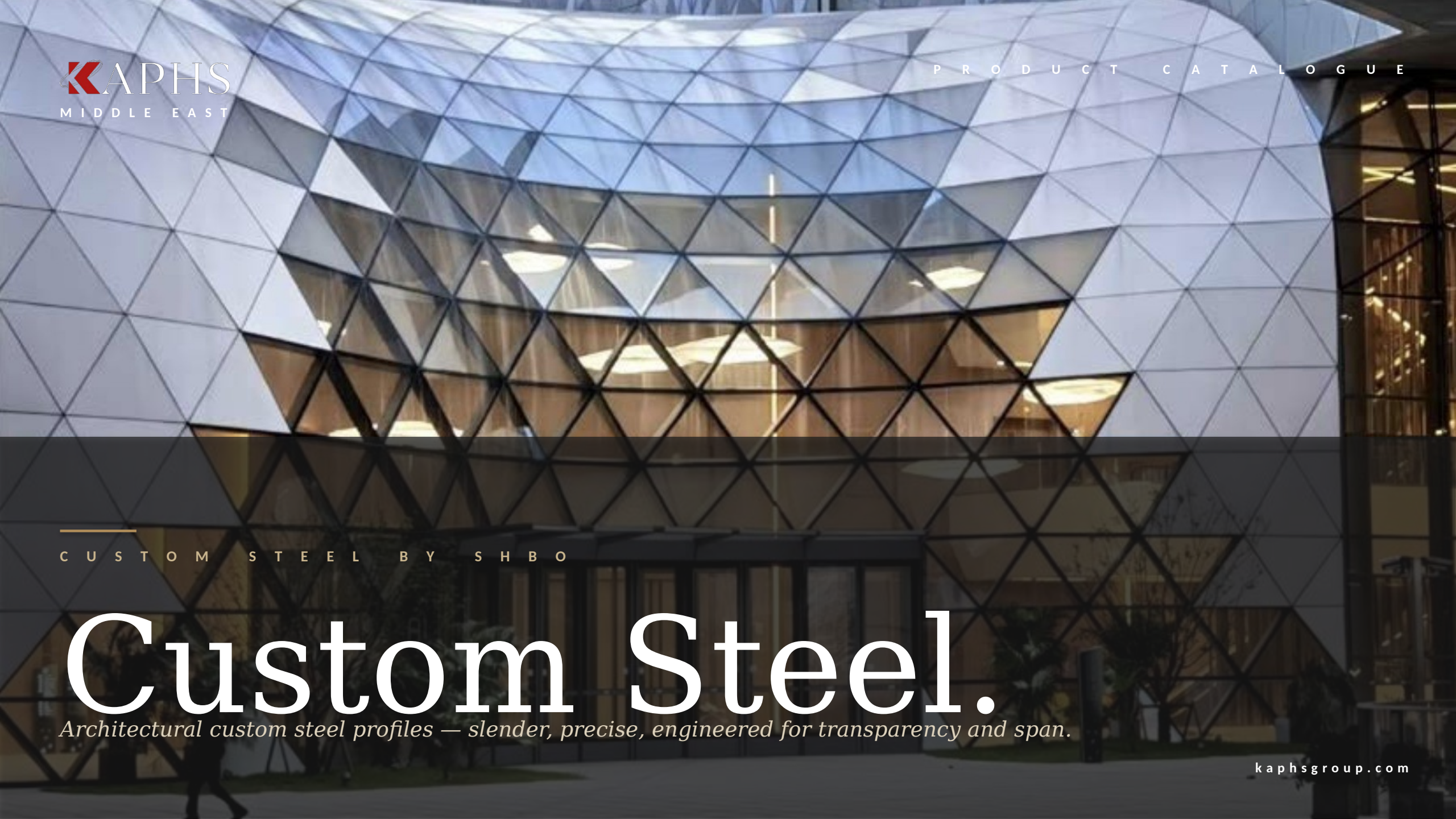
KAPHS
MIDDLE EAST

PRODUCT CATALOGUE



CUSTOM STEEL BY SHBO

Custom Steel.

Architectural custom steel profiles — slender, precise, engineered for transparency and span.

kaphsgroup.com

KAPHS

Contents

A complete guide to the KAPHS Custom Steel system by SHBO — concept, capabilities, product range and projects.

Strength made slender.

KAPHS Custom Steel by SHBO is an architectural profile system that delivers the slender appearance of aluminium with the structural performance of steel. Engineered for large spans, ultra-high transparency and bespoke façade geometries, it solves the pain points that conventional aluminium and traditional steel cannot.

Pioneered by SHBO Group — co-editor-in-chief of the national Technical Specifications for Custom Steel Profile Curtain Wall Systems — Custom Steel has been delivered on more than 100 landmark buildings across China and is now available in the Middle East through KAPHS.

100+

LANDMARK BUILDINGS

30

PATENTED TECHNOLOGIES

25+

YEARS COATING LIFE

An aluminium look, with the strength of steel.

ARCHITECTURAL CUSTOM STEEL PROFIL

KAPHS Custom Steel is a high-precision, made-to-order steel profile system designed specifically for architectural curtain walls. Profiles are produced from carbon, weathering or stainless steel and finished with premium fluorocarbon coatings (AkzoNobel, Jotun, PPG).

Because steel has roughly three times the elastic modulus of aluminium, Custom Steel can carry far greater loads at a fraction of the cross-section — enabling long spans, super-tall window walls, and high-permeability façades that aluminium cannot achieve.

Custom Steel ships either as profiles, assembled unitised steel frame panels, or full space grid structures, reducing on-site work and tightening tolerances.

The World Laureates Forum, Shanghai — ~900 t Custom Steel, 28 m arc spans

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How Custom Steel is made.

An eight-stage process condensed into four disciplines — precision cutting, dual-head welding, fully automated grinding, and a constant-temperature coating line.

01

LASER CUTTING

20 kW CNC laser blanking. Positioning accuracy 0.05 mm, repeat 0.02 mm. Profiles are nested digitally from 1:1 three-dimensional lofting.

02

WELDING

Dual-head robotic CO_2 shielded welding and laser welding — up to 4× faster than manual arc welding, all welds to Level 2 quality.

03

GRINDING

The first fully automated grinding line in the industry. CNC groove-planing to ±0.01 mm, surface roughness Ra 0.8–1.6 µm, R-angle ≤ 0.5 mm.

04

COATING

Integrated sandblast → spray → bake line, constant-temperature rooms. Three-coat fluorocarbon system to ISO 12944-2018; 20-year warranty.

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Applications

Where Custom Steel earns its place — transportation hubs, exhibition landmarks, public buildings, super-tall towers.

Transportation Hubs

TRANSPORTATION HUBS

High-speed rail stations, airports and subway concourses demand long-span roofs, high transparency, and façades that read as light as aluminium while carrying steel loads. Custom Steel is the system of choice — slender, fire-rated, and engineered for the rhythm of civic-scale architecture.

Qingdao SCO Pearl International Expo Center

Exhibition & Cultural Landmarks

EXHIBITION LANDMARKS

Museums, art galleries, libraries, concert halls and exhibition centres rely on Custom Steel for daylit atria, sculptural roofs, and free-form grid shells. Single-curved and twisted geometries are produced from 1:1 three-dimensional lofting — every component digitally fitted before fabrication begins.

The World Laureates Forum, Shanghai

Public Buildings

PUBLIC BUILDINGS

High-ceilinged lobbies, atriums, daylighting roofs, entrances, canopies and unitised steel frame panels — the everyday architecture of public life. Custom Steel reduces on-site work by shipping as assembled units and grid panels, with tighter tolerances than anything achievable on-site.

Zhangjiang Science Hall, Shanghai

Super-Tall Buildings

SUPER-TALL BUILDINGS

Non-standard irregular nodes, bent and twisted components in super-tall structures. Custom Steel allows architects to express slender tower silhouettes without sacrificing structural integrity — a category of detailing that conventional aluminium and traditional steel cannot reach.

Shenzhen Bay Huiyun Center

KAPHS

Engineered at every scale.

Profiles, unitised steel frame panels, and full space grid structures — delivered from five production bases.

Profiles

Standard architectural Custom Steel profiles cut, welded and finished to spec. Lengths customisable. Suitable for façades, curtain walls, fins and brise-soleil.

Unitised Panels

Pre-assembled steel frame panels with glass and infill ready for site lift. Reduced on-site work, tighter tolerances, faster programmes.

Space Grid Structures

Complete reticulated and grid shell structures with bespoke nodes — delivered as transport-ready assemblies for cultural, public and transport architecture.

Standards, certifications, recognition.

SHBO is the co-editor-in-chief of the national Custom Steel Profile Curtain Wall standard.

ISO 9001:2008

Quality Management System certification across all production bases.

National Standard (Co-Editor-in-Chief)

Technical Specifications for Custom Steel Profile Curtain Wall Systems.

Shanghai High-Tech Enterprise

Assessed 2020 by Shanghai Science & Technology Commission.

Specialized, Refined, Featured & Innovative

Recognised " 专精特新 " enterprise (Shanghai).

Polaris Architecture Awards — Best of the Best

Two-time recipient of the 至尊奖 (top architecture honour).

Shanghai Curtain Wall 718 Innovation Award

Three-time recipient.

30 Patents, 9 Software Copyrights

Proprietary IP across cutting, welding, grinding and coating processes.

100+ Landmark Buildings

Delivered across China; now available in the Middle East via KAPHS.

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Why Custom Steel, not aluminium.

Four material properties that change what's possible on the façade.

PROPERTY	CUSTOM STEEL	ALUMINIUM	ADVANTAGE
Elastic Modulus	2.06 × 10^5 N/mm²	0.7 × 10^5 N/mm²	*3× stronger*
Linear Expansion	1.2 × 10^{-5} / °C	2.35 × 10^{-5} / °C	*2× more stable*
Thermal Conductivity	50 W/(m·K)	200 W/(m·K)	*4× lower*
Melting Point	1,538 °C	660 °C	*2.3× higher*

Combined with thin intumescent coatings, Custom Steel achieves 2-hour fire resistance — a slender, safer alternative to both aluminium and conventional steel.

Product Range

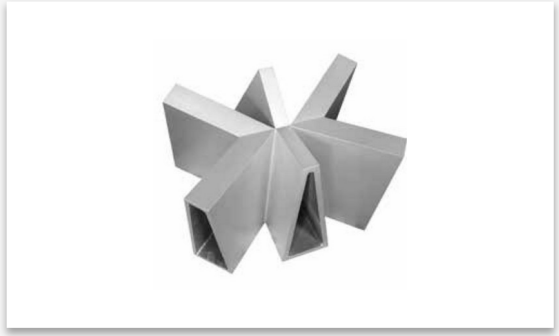
Eight connection nodes — the architectural vocabulary of Custom Steel.

The complete node family.

Eight standard node geometries — each can be customised in size, material and finish.

Triangle Node

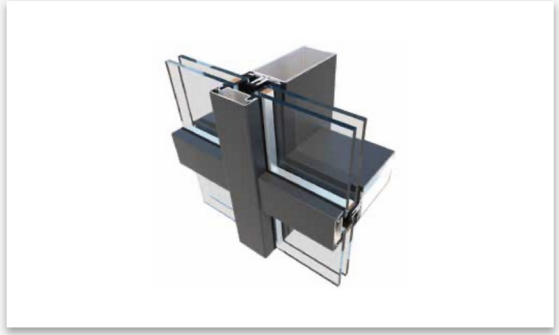
Diamond Connection Node



Diamond Connection Node II

Diamond-Head Connection Node

Rectangular Connection Node



Rectangular Thermal-Sensitive Node

Steel Plate Connection Node

Curved Connection Node

KAPHS

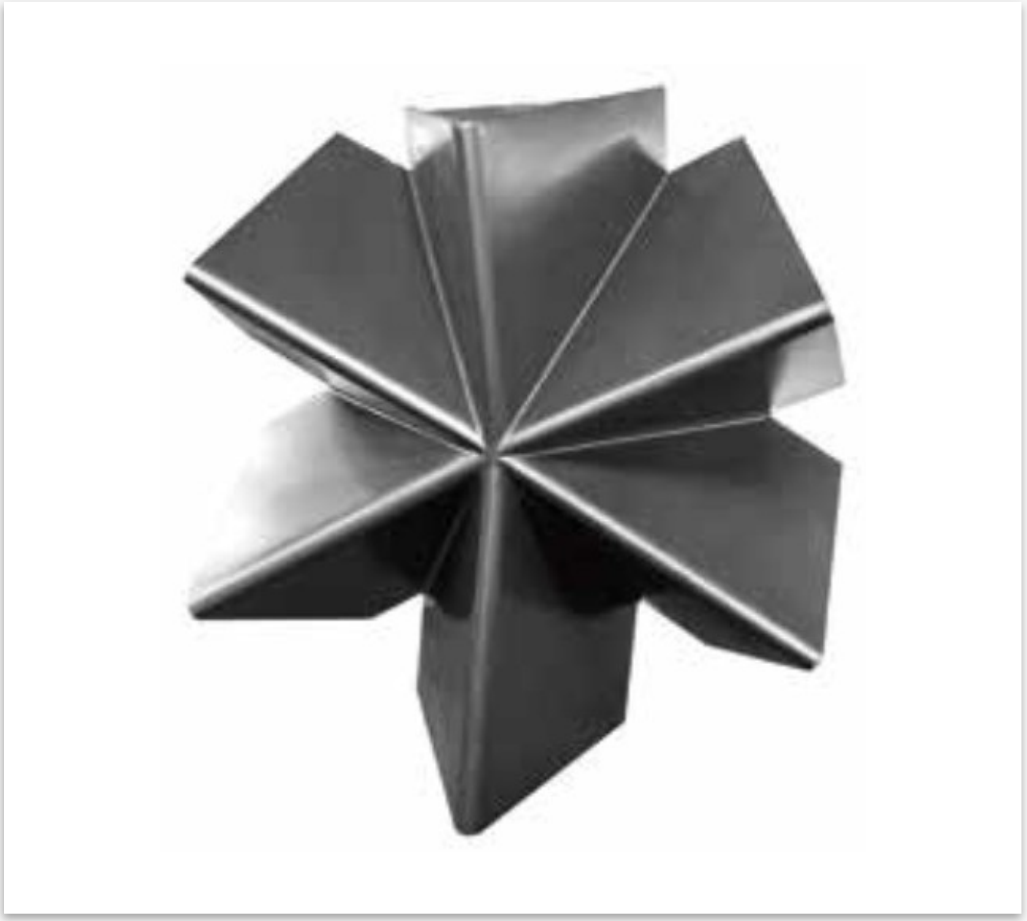
Triangle Node

ABOUT THIS NODE

A clean three-sided node optimised for triangulated façade grids and diagrid frames.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection



Geometry — Triangle Node

Diamond Connection Node

ABOUT THIS NODE

Sharp four-sided connector for diamond-pattern façades and feature grid shells.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection

Geometry — Diamond Connection Node

Diamond Connection Node II

ABOUT THIS NODE

Deeper diamond variant for higher load and longer span applications.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection

Geometry — Diamond Connection Node II

Diamond-Head Connection Node

ABOUT THIS NODE

Tapered diamond head for sculptural intersections and decorative expression.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection

Geometry — Diamond-Head Connection Node

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Rectangular Connection Node

ABOUT THIS NODE

The workhorse — orthogonal, high-stiffness connector for unitised curtain wall frames.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection

Geometry — Rectangular Connection Node

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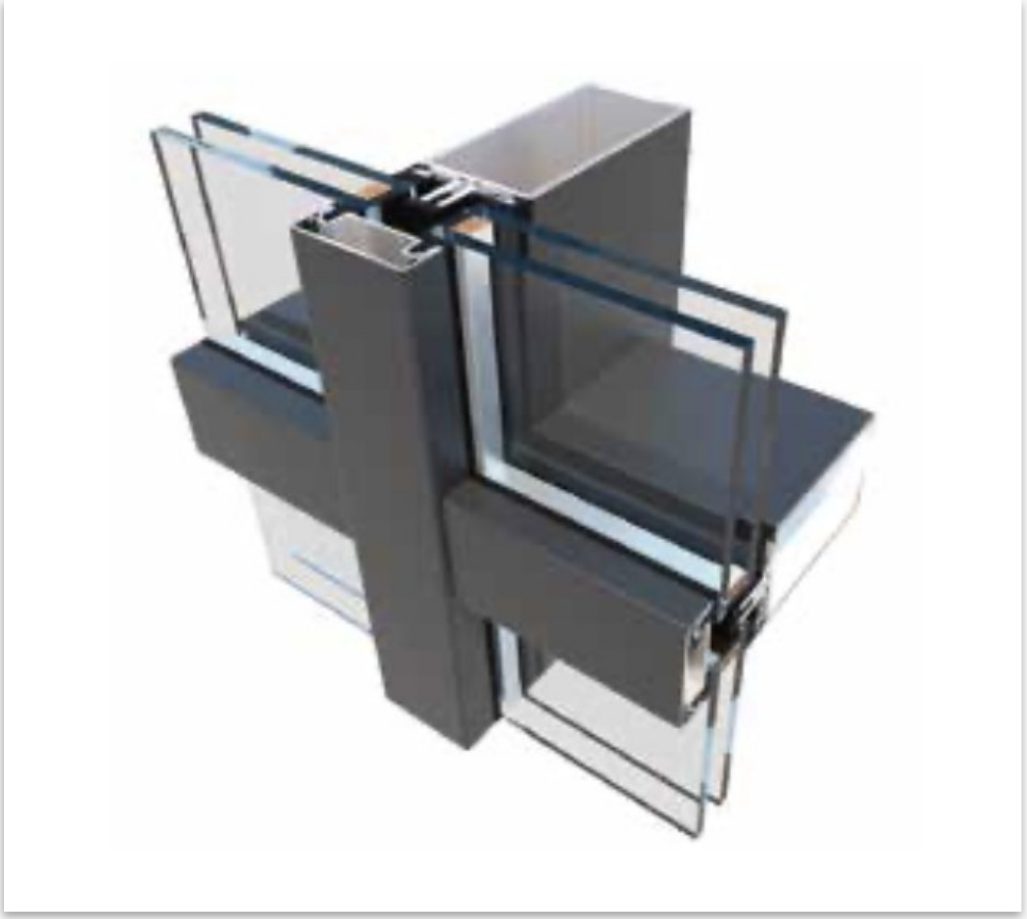
Rectangular Thermal-Sensitive Node

ABOUT THIS NODE

Thermally broken rectangular node for high-performance, energy-efficient envelopes.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection



Geometry — Rectangular Thermal-Sensitive Node

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Steel Plate Connection Node

ABOUT THIS NODE

Flat-plate connector for cable-stayed structures and tension grids.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection

Geometry — Steel Plate Connection Node

Curved Connection Node

ABOUT THIS NODE

Continuously curved node for free-form, twisted and arc geometries.

AT A GLANCE

MATERIAL	Q235B/Q355 carbon, 304/316 stainless, weathering steel
TOLERANCE	±0.05 mm position, ±0.01 mm groove, Ra 0.8–1.6 µm
FINISH	Three-coat fluorocarbon, custom RAL / wood / metallic
CONNECTION	Welded (rigid), bolted, or pin-connection

Geometry — Curved Connection Node

Reference Projects

Over 100 landmark buildings delivered worldwide — a selection.

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Zhangjiang Science Hall

SHANGHAI, CHINA

ARCHITECT — Christian de Portzamparc

A special-shaped spatial grid structure with thin fire-protection requirements. The project was split into 40 transportable units and assembled with 1:1 three-dimensional positioning lofting. Themes: sunlight, earth, water, air.

15 m	150 t	1,200 m²
SPAN	STEEL	AREA

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The World Laureates Forum

LIN-GANG SPECIAL AREA, SHANGHAI

ARCHITECT — Arcplus Institute of Shanghai Architectural Design & Research

"Future wings and green aesthetics." Feather-like, overlapping BIPV panels integrated into the roof — a symbiosis of architecture, city and nature. 21 m beams and 28 m arc components, ~5 t each, in single-curved Custom Steel.

28 m arc	~900 t	5,000 m²
SPAN	STEEL	AREA

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Qingdao SCO Pearl International Expo Center

JIAOZHOU, QINGDAO

ARCHITECT — Cui Kai (Chinese Academy of Engineering)

"Sea of blossoms, glowing pearls and shells" — Qingdao's coastal heritage rendered in white Custom Steel. 50-day production cycle, 0.1 mm hole-distance tolerance on cable-stayed ear plates, all welds to Level 2.

32 m	~500 t	3,100 m²
LENGTH	STEEL	AREA

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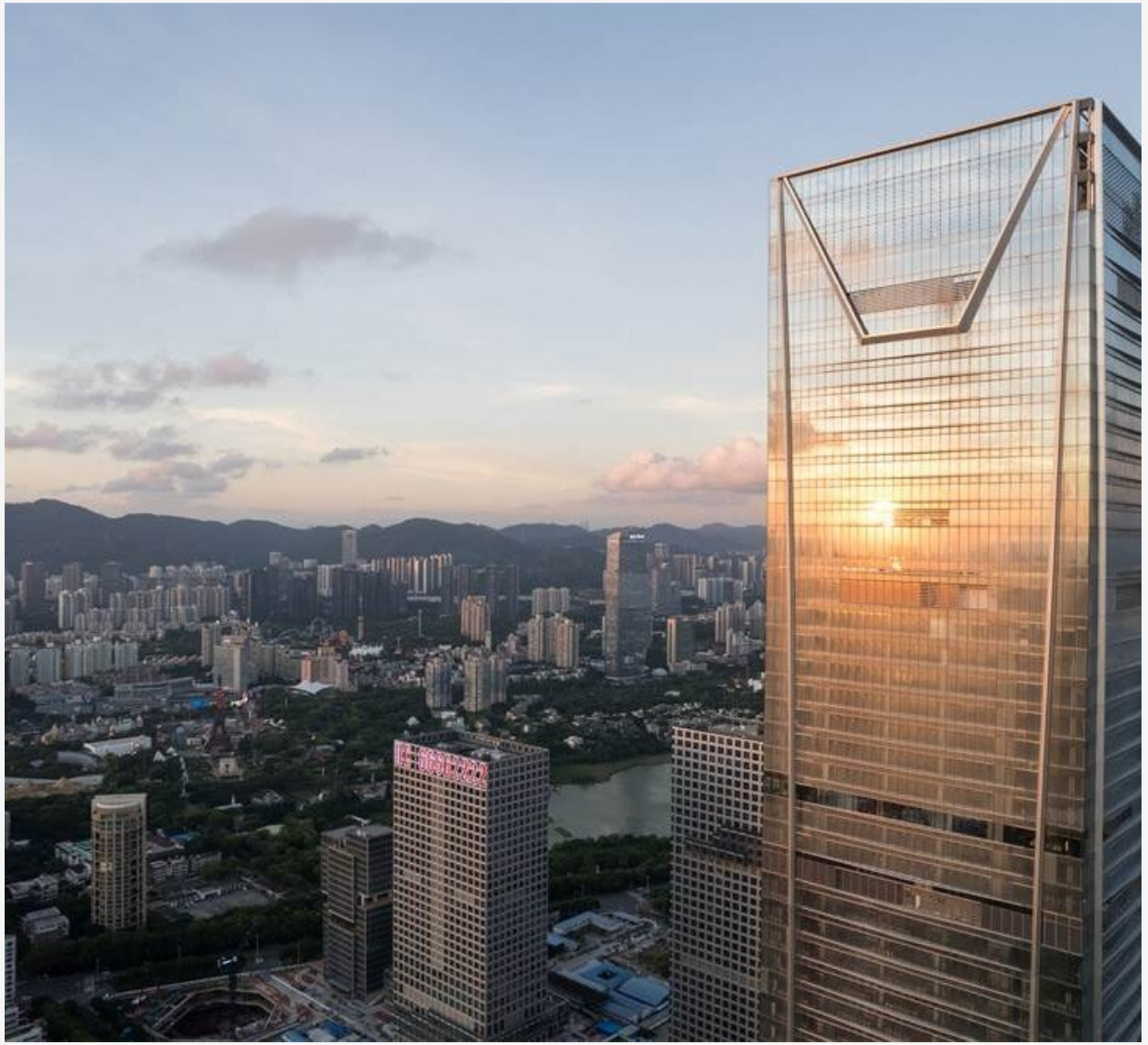
Shenzhen Bay Huiyun Center

NANSHAN DISTRICT, SHENZHEN

ARCHITECT — AREP (France) + Shenzhen AUBE

The first TOD super-complex by Shenzhen Metro Group, inspired by "the lighthouse on the bay." Trapezoidal Custom Steel columns and beams in bright fluorocarbon silver.



17 m	150 t	3,000 m²
SPAN	STEEL	AREA

Lululemon Shanghai Flagship

KERRY CENTRE, JING'AN, SHANGHAI

ARCHITECT — AIM Architecture

The largest Lululemon flagship store in the world. Curved columns and arc beams up to 17 m, with crisp 90° edges in pearl white. "A perfect combination of art and engineering."

17 m	12 t	1,041 m²
LENGTH	STEEL	AREA

179 East Nanjing Road

HUANGPU DISTRICT, SHANGHAI

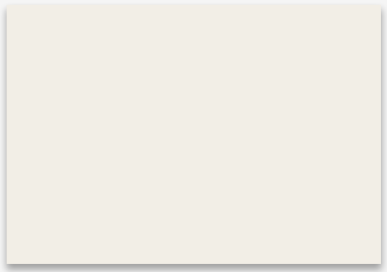
ARCHITECT — Coast Palisade Consulting Group (Canada)

A cross-shaped corridor roof set between four 1920s–1930s historic buildings on Nanjing Road. Silver irregular grid shell, split into 64 maximum-transportable units using 1:1 three-dimensional lofting. "Respecting history, reviving style."

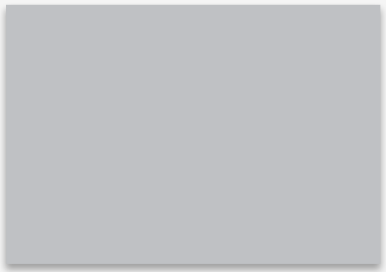
~500 t	2,750 m²	64 panels
STEEL	AREA	UNITS

Surface finishes.

Premium fluorocarbon coatings, stainless treatments, and fully bespoke colour matching.

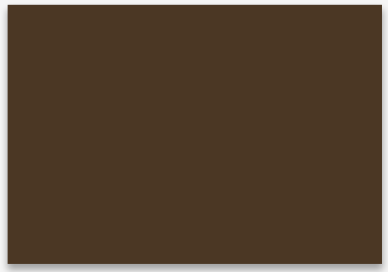

Pearl White

Winland White

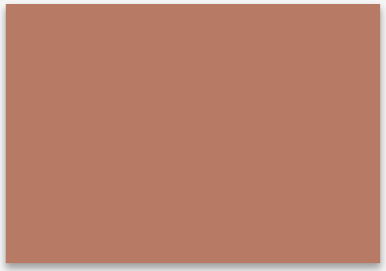

Silver Fluorocarbon

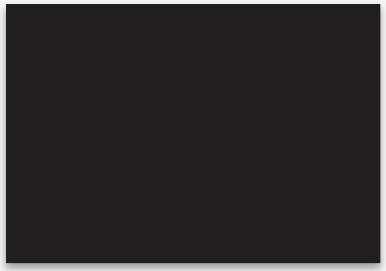
Bright Silver


Coffee Gold


Antique Bronze


Fluorocarbon Gold


Rose Gold


Fluorocarbon Black

Mirror Polished


Wire-Drawing


Apple Sand

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Built to specification.

Every Custom Steel profile is engineered project-specific — material, geometry, finish and connection.

MATERIALS	TOLERANCES	COATING SYSTEM	WARRANTY & FIRE
Q235B / Q355 carbon steel	Laser position ±0.05 mm	ISO 12944-2018 / NORSOK M-501	20-year coating warranty
Weathering steel	CNC groove ±0.01 mm	Epoxy zinc-rich primer 60–80 µm	25+ year coating design life
Stainless 304 / 316	Punch ±0.05 mm	Epoxy micaceous mid 120–140 µm	2-hour fire resistance available
Hot-dip galvanised options	Straightness <0.5‰ L	Fluoropolymer topcoat 50–60 µm	ISO 9001:2008 certified

KAPHS

Let's specify your next façade.

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