

Commercial Proposal for Supply

Geodesic & Stratodesic Dome Structures for Commercial Use

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B2B / B2C | GLOBAL PROCUREMENT

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Executive Summary

Geodesic and stratodesic domes represent one of the most materially efficient structural forms in modern architecture. By distributing loads uniformly across a self-supporting shell, domes achieve 30–40% material savings compared to rectilinear buildings of equivalent enclosed volume, while delivering superior seismic resilience, aerodynamic stability, and thermal performance. Applications span exhibition pavilions, planetariums, eco-resorts, event venues, and premium glamping lodges. Metal-Asia.pw provides **Global Procurement** of engineered dome systems from audited Chinese manufacturers, complete with **Supply Chain Compliance**, independent materials verification, and worldwide installation supervision.



Geodesic dome structures for exhibitions, hospitality and eco-resorts

Client Pain Points in Direct China Procurement

- **Structural Analysis Complexity.** Geodesic domes require 3D finite-element modelling for wind, seismic, and point-load cases. Chinese vendors frequently supply only 2D sketches or GB-code internal calculations without EN 1993 or AISC 360 equivalence, leaving buyers without engineer-of-record approval.
- **Node-Fabrication Precision.** Steel or aluminium connectors must maintain angular tolerances within $\pm 0.5^\circ$ to ensure shell integrity. Without independent dimensional inspection, delivered nodes exhibit gaps, eccentricities, and stress concentrations that complicate field assembly and reduce fatigue life.
- **Climatic & Material Mismatch.** Chinese timber and membrane suppliers often specify materials rated for -20°C to $+50^\circ\text{C}$, whereas projects in Northern Europe, Central Asia, or high-altitude regions demand certification to -50°C and UV resistance per EN 12216 / ISO 4892.
- **Packaging & Logistics Risk.** Struts 2–5 m long and precision-machined hubs require rigid crating with VCI corrosion protection. Inadequate packaging leads to transit

deformation, galvanic corrosion, and costly on-site rework.

- **Regulatory Documentation Gaps.** Domes classified under HS 9406.90 require CE/UKCA marking, structural DoP declarations, and fire-classification reports (EN 13501-1). Direct suppliers rarely provide this bundle, causing customs detention and permitting delays.

Our Professional Solution: Supply Chain Compliance & Direct Access

Metal-Asia.pw closes every gap in the dome procurement lifecycle through verified transparency and technical control:

- **Factory Technical Audit** covering CNC machining tolerances, ISO 9001, and welder certification to EN ISO 9606.
- **Independent Materials Verification:** spectrometric analysis of hub steel, tensile testing of aluminium struts, timber moisture and grade verification.
- Structural peer review by chartered engineers against EN 1993, EN 1999 (aluminium), and Eurocode 8 seismic provisions; PE-stamped drawings where required.
- **Trade Compliance & Logistics** — correct HS classification, duty-drawback, origin-certificate management, and heavy-haul route planning.
- **Installation Supervision** by dome-assembly specialists at any global site.
- Milestone payment (30/40/30) linked to Factory Acceptance Testing, dimensional verification, and packing-list audit.

Complete Product Range

Table 1. Geodesic Domes (Triangulated Frame)

Model	Diameter, m	Height, m	Floor Area, m ²	Frequency	Strut Material	FOB Price, USD
GD-01 "Mini"	6	3.6	28	2V	Pine / larch 45 x 70 mm	8,500 – 10,500
GD-02 "Standard"	10	6.0	79	3V	Pine / larch 45 x 95 mm	18,000 – 22,000

GD-03 "Business"	15	9.0	177	3V	Aluminium 50 x 50 mm + steel hubs	42,000 – 50,000
GD-04 "Premium"	20	12.0	314	4V	Aluminium 60 x 60 mm + steel hubs	78,000 – 92,000
GD-05 "Large"	25	15.0	491	4V	Steel tube Ø48 x 3 mm	115,000 – 135,000
GD-06 "Mega"	30	18.0	707	5V	Steel tube Ø60 x 3.5 mm	165,000 – 195,000

Table 2. Stratodesic Domes (Meridian Arches)

Model	Diameter, m	Height, m	Floor Area, m ²	Arch Material	Finish	FOB Price, USD
SD-01 "Classic"	8	5.0	50	Glulam 80 x 180 mm	Bituminous shingles	22,000 – 26,000
SD-02 "Eco"	12	7.5	113	Glulam 80 x 200 mm	Timber shingles / planken	48,000 – 56,000
SD-03 "Commercial"	16	10.0	201	Glulam 100 x 220 mm	Bituminous shingles + membrane	82,000 – 95,000
SD-04 "Residence"	20	12.5	314	Glulam 120 x 240 mm	Copper shingles (optional)	125,000 – 148,000

Table 3. Coverings, Glazing & Options

Component	Description	Price, USD
PVC roofing membrane	PVC 1.5 mm, 15-year warranty	12 – 18 / m ²
Bituminous shingles	Scandinavian collection, 20-year warranty	18 – 25 / m ²
Triangular glazing units	Double low-E argon, 4-16-4	220 – 350 / m ²
Entrance door set	Aluminium 900 x 2100 mm, thermal break	850 – 1,400
Foundation system	Helical piles Ø108 mm + perimeter channel	3,500 – 7,500
Internal lining	Tongue-groove, plasterboard, rock wool 150 mm	35 – 55 / m ²
MEP package	Electrical, HVAC, water, underfloor heating	on request

Technical Specifications

- **Seismic resistance:** Geodesic triangulation enables survival at intensities up to 9 MMI; loss of up to 40% of struts does not precipitate global collapse.
- **Aerodynamic performance:** Spherical form factor yields minimal wind drag; structures are verified for wind speeds up to 50 m/s per EN 1991-1-4.
- **Thermal efficiency:** Reduced surface-area-to-volume ratio cuts heat loss by 25–35% versus rectangular buildings. Wall U-value 0.18–0.22 W/(m²·K) with 200 mm insulation achieves $R = 4.5\text{--}5.5\text{ m}^2\cdot\text{K}/\text{W}$.
- **Hub material:** S355 steel, hot-dip galvanised 40 µm, or stainless steel AISI 304 for marine environments.
- **Timber struts:** Glulam or solid sawn timber, moisture content 12±2%, treated with vacuum-pressure preservative and EN 335 durability class 3/4.
- **Metal struts:** Aluminium alloy 6063-T6 or S235JR steel tubes with powder coating to Qualicoat class 2.

HS Codes, Customs & Trade Compliance

Product	HS Code	Typical Duty	VAT/GST	Key Document
Steel / aluminium hubs and nodes	7308.90.80 / 7604.10	0–7.5%	20% / state VAT	Mill certificate, origin certificate
Timber struts (glulam / sawn)	4407.99	0–5%	20% / state VAT	FSC/PEFC, phytosanitary certificate
Aluminium struts	7604.10.90	0–5%	20% / state VAT	CE marking, EN 755
Bituminous shingles / PVC membrane	6807.10 / 3925	0–5%	20% / state VAT	CE marking, fire-classification report
Triangular glazing	7008.00.80	0–5%	20% / state VAT	CE marking, EN 1279
Complete dome kit (prefab)	9406.90.10	0–3%	20% / state VAT	CE/UKCA (CPR), DoP, structural report

Metal-Asia.pw vs Direct China Sourcing

Evaluation Criterion	Direct China Supplier	Procurement via Metal-Asia.pw
Structural Calculations	Partial or Chinese-language only	Full set in English: FEM, connection design, PE stamp
Hub Dimensional QC	None	CMM verification , angle and gap inspection
Climatic Adaptation	Standard CN range	Materials rated to -50°C, enhanced UV stabilisation
Packaging & Logistics	Standard; deformation risk	Rigid crating, VCI, shock logging, insurance
Customs Brokerage	Buyer-managed	End-to-end brokerage
Installation Supervision	Not available	Specialist supervisors on site
Tender & EPC Support	None	FIDIC / IFC / World Bank compliant

Integrated Services Portfolio

- [Factory Technical Audit](#) — CNC tolerance, ISO 9001, welding QC.
- [Global Procurement Services](#) — contract-to-commissioning management.
- [Trade Compliance & Logistics](#) — customs, heavy-haul, origin.
- [B2B Supplier Due Diligence](#) — credit, litigation, reputation.
- [Engineered Procurement](#) — specification optimisation.
- [Materials Testing and Coating Verification](#).
- [MEP Engineering](#) — HVAC, plumbing, electrical design.
- [Installation Supervision](#) — assembly management, commissioning.

Frequently Asked Questions (FAQ)

1. What is the lead time for a 15 m diameter dome?

Hub and strut fabrication: 20–30 days. Timber treatment (drying, preservative): 10–15 days. Ocean freight: 20–25 days. On-site assembly: 5–10 days depending on crew experience.

2. Is a building permit required for a dome?

Permanent domes over 500 m² generally require permits and structural certification. Smaller units (under 50 m²) may qualify for simplified registration. We supply engineer-stamped calculations and DoP declarations to support permitting.

3. What foundation is needed?

Thanks to uniform load distribution, domes require minimal foundations. Helical piles Ø108 mm around the perimeter or a shallow ring beam (300 x 300 mm) are usually sufficient. For spans over 25 m, a reinforced ring beam or pad foundations are recommended. We provide foundation briefs calibrated to geotechnical data.

4. Can domes be used in seismic zones?

Yes. Geodesic triangulation provides exceptional seismic resilience. Designs are verified for PGA 0.3g–0.5g (equivalent to 7–9 MMI) per Eurocode 8 or local seismic codes.

5. How is winter thermal performance assured?

Multilayer construction — 150–200 mm rock wool + vapour barrier + ventilated cavity — achieves $R = 4.5\text{--}5.5 \text{ m}^2\cdot\text{K}/\text{W}$. Combined with high-performance triangular glazing, heating demand is comparable to Passive House levels.

6. What warranty is provided?

Metal hubs and connectors: 15 years. Timber struts (with preservative treatment): 10 years. Roofing membrane / shingles: 10–20 years depending on material. Structural frame integrity: 15 years.

7. Can bespoke forms be delivered?

Yes. Our [Engineered Procurement](#) team develops ellipsoidal forms, combined facades, green roofs, internal mezzanines, and multi-dome linked complexes.

8. Do you support public-sector tenders?

Yes. We prepare full tender documentation under FIDIC, IFC, and World Bank procurement guidelines, including performance bonds, advance-payment guarantees, and milestone schedules.

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Order geodesic dome design and supply with worldwide installation support