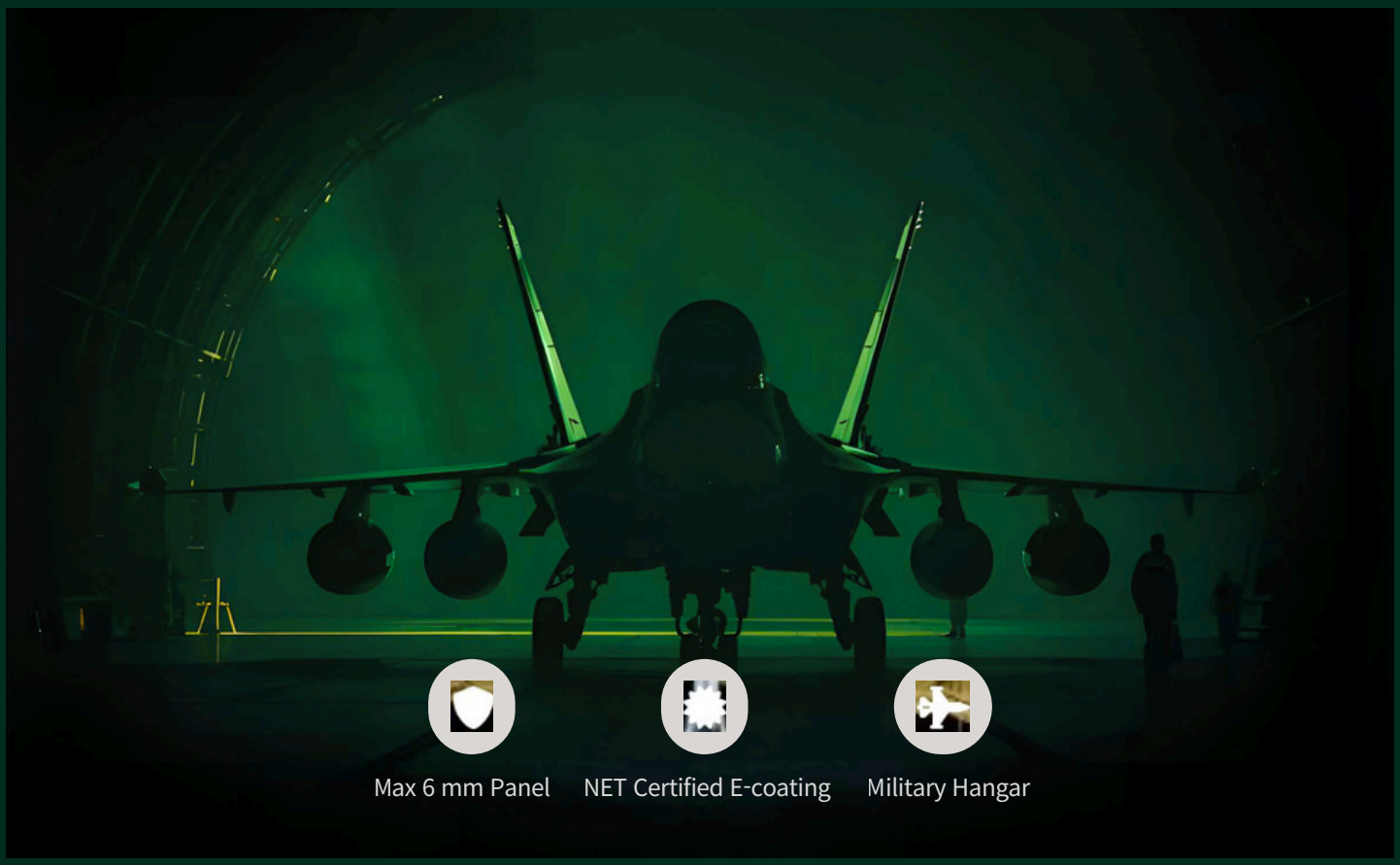
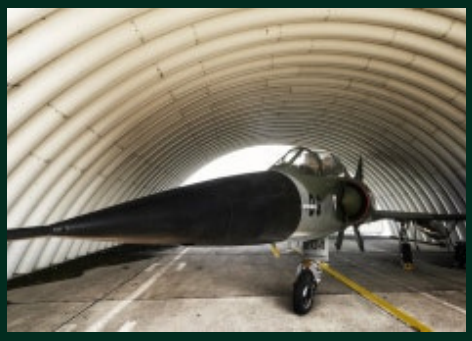
REXSTEEL

Wonder Arch HAS system

HAS(Hardened Aircraft Shelter)

A Revolutionary Protective Solution for the Future Battlefield





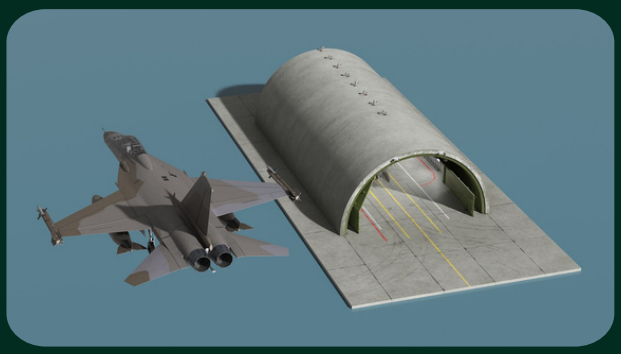
Evolving Threats, Essential Protection

The nature of modern warfare has changed

The Russia-Ukraine war and Middle East conflicts clearly show the rise of asymmetric threats. Asymmetric attacks using low-cost drones and high-precision missiles have emerged as a key threat. It has become common for state-of-the-art fighter jets, worth tens of millions of dollars, to be destroyed by drone attacks costing only a few hundred dollars.

The Necessity of Hardened Aircraft Shelters

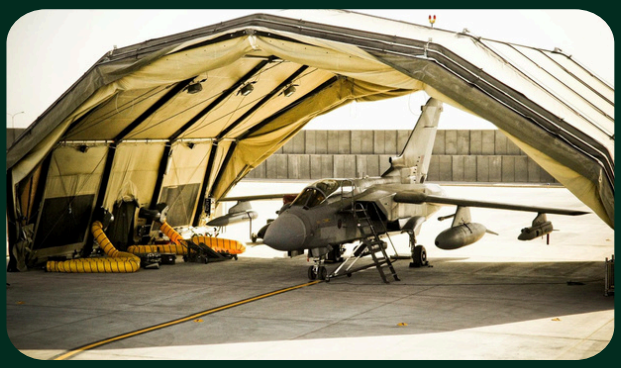
Without physical facilities to safely protect high-value aviation assets, the entire air force, built with a massive budget, could be neutralized. The Hardened Aircraft Shelter (HAS) is no longer an optional upgrade but an indispensable element of national security.



Serious Gap in Protective Infrastructure

Global Infrastructure Deficiency: Even the world's most powerful military, the U.S. forces, lacks sufficient permanent HAS and uses temporary fabric facilities with significantly lower protective performance.

Increasing Domestic Demand: Due to an increased need for hangars and military facility expansion projects, the demand for military facilities like HAS and ammunition depots is exploding.

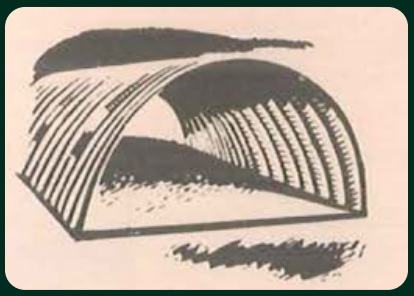


Introducing the REXSTEEL WonderArch HAS System

WonderArch: The Game Changer

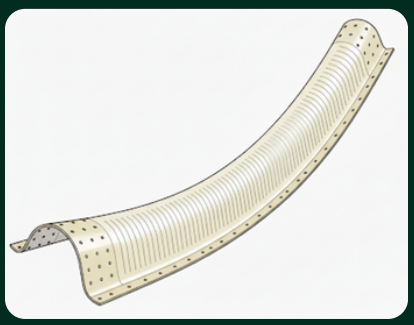
WonderArch is not just a simple construction material, but a 'game changer' that can alter the paradigm of protective structure construction.

Key Structural Characteristics



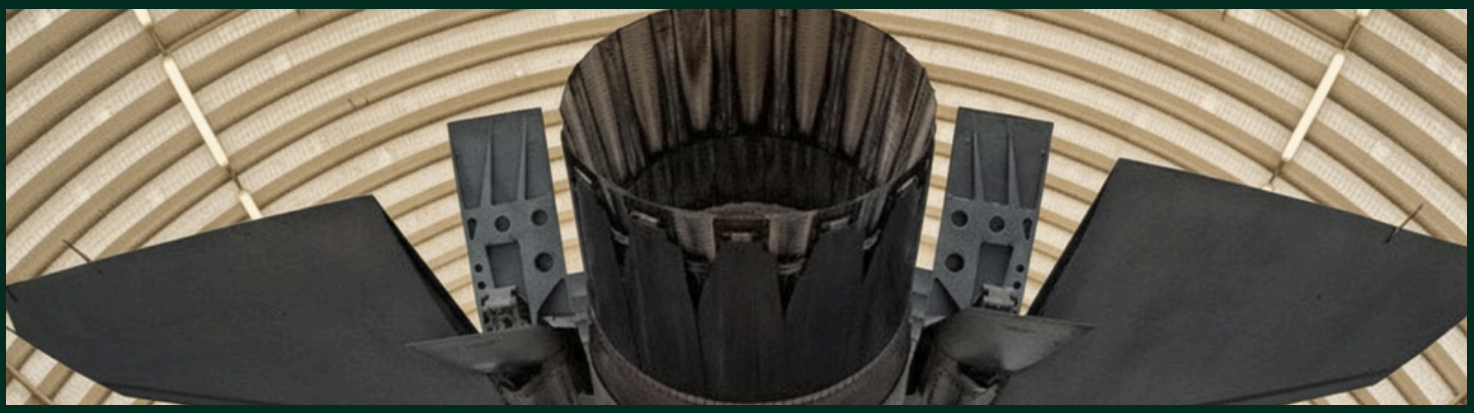
Self-Supporting Arch Structure

It is an arch-shaped structure without structural steel trusses. Wonder Panels are connected with bolts of a suitable standard to form a structural arch. It maximizes structural efficiency without trusses or frames, reducing labor costs and construction time by up to 50%.



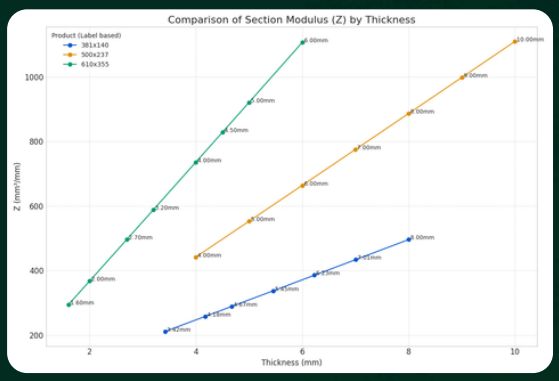
Double Corrugation Design

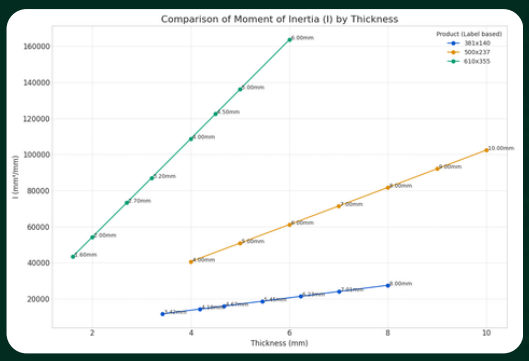
Each Wonder Panel is corrugated with small folds using the 'Coro-Crimped' method. The assembled panels form large corrugations at intervals of about 2 feet (610mm). This double corrugation and the Coro-Crimped process introduce a secondary vertical corrugation to the panels, enhancing stiffness in multiple axes.



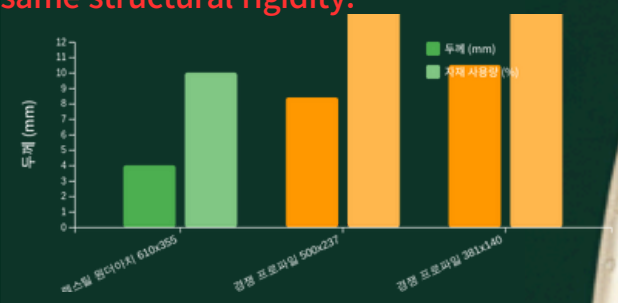
WonderArch's Technical Superiority: Structural Efficiency

REXSTEEL's WonderArch 610x355 profile, at only 4.0mm thick, exhibits a level of stiffness (moment of inertia) that conventional large corrugated steel plates (500x237) can only achieve at a thickness of 8mm or more.





Thickness and material usage for the same structural rigidity.



Relative Material Usage by Thickness (Baseline: Rexsteel WonderArch 610x355 = 100%)

Overwhelming Material Efficiency

- **Raw Material Cost Reduction**
  At least 50% reduction in material costs compared to competing products
- **Reduced Structural Self-Weight**
  Lessens the burden on foundation work due to a lighter structure.
- **Transportation and Cost Reduction**
  Easier to transport and install due to its smaller thickness.
- **Improved Construction Efficiency**
  Reduced installation time and manpower due to decreased structural complexity.

Width: 610mm

Matches the U.S. DoD standard for 2-foot (610mm) sine-wave pitch.

Corrugation Depth: 355mm

Perfectly aligns with the design standards of the Taiwan HAS project.

Material Standard: KS D 3506

Managed under 'WonderArch Specifications' and fully compliant with domestic standards.

Production Capability

- Current Production Capacity:
  Able to produce up to 4.0mm.
- Target Production Capacity:
  Able to produce up to 6.0mm.

Introducing PosMAC

What is PosMAC ?

Innovative Coating Material: Instead of hot-dip galvanizing, REXSTEEL has adopted a patented hot-dip zinc-magnesium alloy coating technology.

Technical Differentiation: PosMAC offers 5-10 times improved corrosion resistance compared to conventional coating materials.

Enhanced Protective Capability: The properties of the magnesium alloy provide an enhanced protective effect, offering greater stability and durability.

Technical Differentiators

Coating Material Comparison

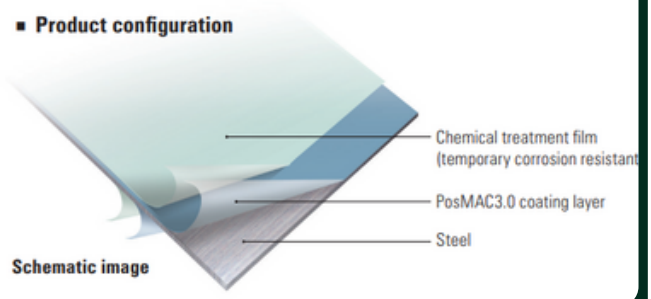
HGI	PosMAC
Hot-dip galvanizing Standard corrosion resistance	Hot-dip zinc-magnesium alloy plating 5-10 times improved corrosion resistance

Key Features of PosMAC

- Long-term protection due to an enhanced corrosion-resistant coating layer from the properties of magnesium
- Improved protection effect from the properties of magnesium alloy
- Provides exclusive technical differentiation

* **PosMAC®3.0** is the registered trademark of POSCO.

■ **Product configuration**



Schematic image

Comparison to galvanized(GI(H)) in corrosion resistance on flat surfaces(CCT)

· PosMAC3.0 shows 5 to 10 times the corrosion resistance compared to galvanized steel sheet on flat surfaces.

CCT	GI(H)				PosMAC3.0		
The coating weight on both sides	120g/m²	200g/m²	300g/m²	600g/m²	140g/m²	200g/m²	275g/m²
10 cycle (80Hr)							
70 cycle (560Hr)							
120 cycle (960Hr)							

Test method : Cyclic Corrosion Test (CCT),
[ISO 14993] 1Cycle : Salt Spray 2Hr(5%NaCl, 35%) → Dry 4Hr(25%RH, 60℃) → Wet 2Hr(95%RH, 50℃)

Innovativeness of NET-Certified(KOREA) Electro-coating Technology

Conventional Method (Post-assembly painting)

WonderArch Method (Assembly after electro-coating)

AUneven manual coating on complex shapes causes cracking and peeling defects within a few years, necessitating frequent repairs.

NET-certified tech coats individual panels before assembly, preventing cracking and peeling for semi-permanent durability.

Proven Protective Performance

WonderArch is not a theoretical or lab-level new technology, but a highly reliable system that has proven its performance over decades in the most demanding military environments.

7-Bar Ammunition Depot and HAS Blast Test

Successfully tested by the U.S. military, it meets the highest explosion resistance standards of NATO and the U.S. DoD.

Napalm Test

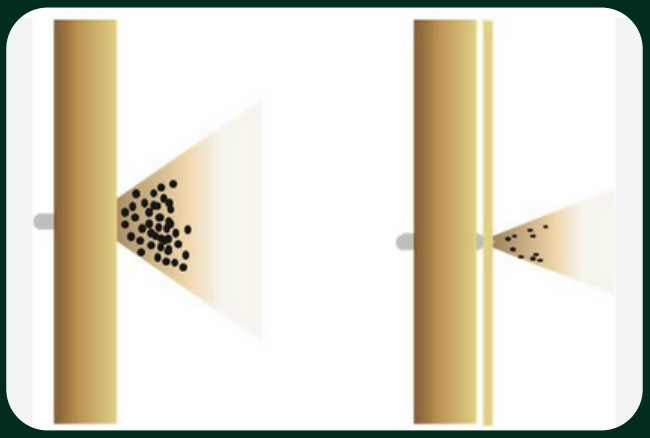
Proved to maintain structural stability even in extreme fire environments. .

Tornado Missile Impact Test

The only arch-type building system to have successfully passed the test conducted at Texas Tech University.

Spall Liner Effect

During a blast impact, deadly secondary fragments from the inner concrete wall destroy internal personnel and equipment. WonderArch, thanks to its own robust structure, provides an effect that suppresses the scattering of fragments.



WonderArch vs. Conventional Hangar Solutions Comparison

Item	Traditional Hangar (Steel/RC Structure)	Rexsteel WonderArch Hangar
Structure Type	Steel truss + Concrete (with internal columns)	Patented steel arch panels (no internal trusses/columns)
Period	Long, requires large-scale equipment	Modular assembly, on-site period shortened by 50%
Construction Cost	Complex structure → High cost	Total cost reduction(labor/material costs↓)
Internal Space	Space limited by trusses/columns	100% usable without columns, space efficiency maximized
Protective Performance	Basic protection (varies by design)	Highest grade 7-Bar blast protection, passed missile impact test
Durability	Concerns of concrete cracking/corrosion	Electro-coating fundamentally blocks corrosion, semi-permanent durability

REXSTEEL WonderArch's Key Competitive Advantage: A 'market leader' level solution that solves the complex structure and maintenance hassles of traditional hangars while providing state-of-the-art protective performance and excellent durability.

WonderArch's Key Competitive Advantages

REXSTEEL's Unrivaled Technology

NET-Certified Electro-coating Technology(KOREA)

Double Corrugation Design
Provides superior resistance to multi-directional loads.

Structural Efficiency
Offers equal stiffness with at least 50% less material than competitors.

Production Capability
Can produce up to 6.0mm thickness, complying with KS standards.

Eco-Friendly
A process that uses baking soda and generates no harmful wastewater.

Protective Performance
Successfully passed 7-Bar blast and tornado missile impact tests.

Value Provided to the Customer

Structural Efficiency
Offers equal stiffness with at least 50% less material than competitors.

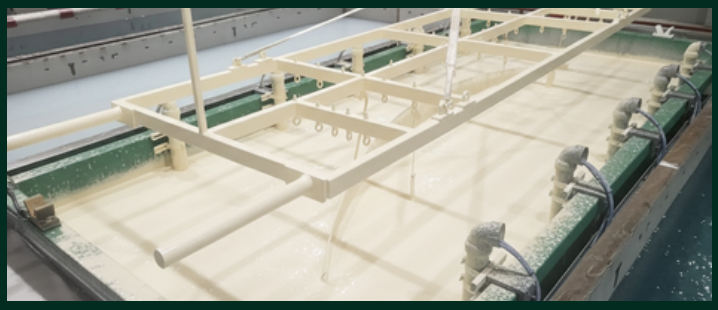
Space Optimization
The self-supporting shell creates 100% unobstructed interior space.

Long-term Durability
NET electro-coating prevents corrosion for semi-permanent durability.

Future-Ready Protection
Effectively counters growing threats from drones and precision missiles.







REXSTEEL

신한스틸파이프(주) SHINHAN Corrugated Steel Pipes Co.,LTD.

대한강관주식회사 DAEHAN Corrugated Steel Pipes Co.,LTD.

www.rexsteel.kr

Head Office/Factory Address : 344-4 Gwangjeong-ro, Haman-myeon, Haman-gun, Gyeongsangnam-do
Phone: +82-55-800-8901 Fax: +82-55-800-8903

Uiwang Office Address : #816, Ace Hi-Tech Vision 21, 732 I-dong, Uiwang-si, Gyeonggi-do
Phone: +82-31-360-0296 Fax: +82-31-360-0297