

SHEERGARD®

Protecting Under Pressure

HIGH PERFORMANCE RADOMES

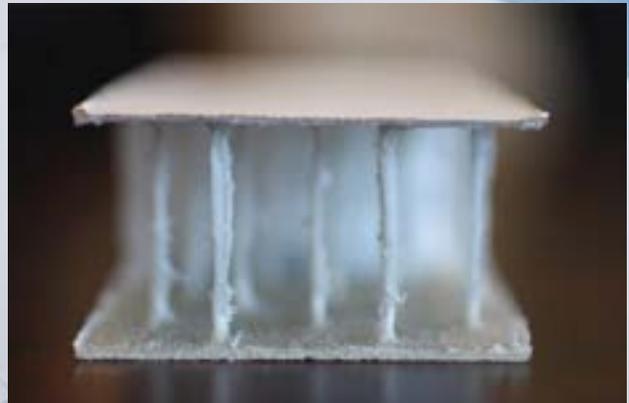
SANDWICH RADOMES

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SHEERGARD® sandwich radomes are rigid, self-supporting structures designed to protect various communication systems. They operate as a transparent electromagnetic protective structure for systems with frequencies up to 12GHz (X-Band). SHEERGARD® sandwich radomes are the first of their kind to offer a non-delaminating, permanently hydrophobic panel construction that requires minimal maintenance to remain fully operational over their 20 year service life.

The technological advancements were developed and validated through the United States Air Force's SBIR program which focused on removing the ongoing maintenance and repair costs currently associated with the radome industry. The technology was certified through rigorous testing and full scale prototyping to ensure the demands were met.

- **Sandwich radome technology developed with US Air Force**
- **Permanent hydrophobicity**
- **Maintenance free surface**
- **Non-delaminating**
- **No-painting or resurfacing**



HOW WE PREVENT DELAMINATION

In order to guarantee structural integrity, sandwich radomes must maintain the bond between their skins and the core. If this bond is broken, even a small area of delamination can result in catastrophic failure.

SHEERGARD® sandwich radomes are the first of their kind to use 3D fiber reinforcements within its composite structure. They fundamentally prevent delamination of the skin from the core by providing a tangible connection between the top and bottom skins.

Tests such as 'ASTM E2004' quantify delamination resistance by measuring the force required to peel the skin from the core. In like-for-like testing, the presence of 3D inserts provides 10X the delamination resistance than that of a traditional sandwich panel.

A PERMANENT COATING IS THE ONLY WAY TO REMOVE THE COST OF RESURFACING AND MAINTAIN SUPERIOR ELECTROMAGNETIC PERFORMANCE



HOW WE ELIMINATE SURFACE MAINTENANCE

Permanent hydrophobicity of a radome's outer surface is critical. Since water has both a high dielectric constant and loss tangent, even a minor loss of hydrophobicity would allow water to sheet on the radome's surface and cause extremely high transmission losses. A permanent coating is the only way to remove the cost of resurfacing and maintain superior electromagnetic performance.

SHEERGARD® radomes utilize the 70+ years of Saint-Gobain's fluoropolymer radome experience to provide permanent hydrophobicity with a PTFE coated fiberglass fabric. Air-supported sites that use this same technology have been in operation for decades without any need for surface maintenance.

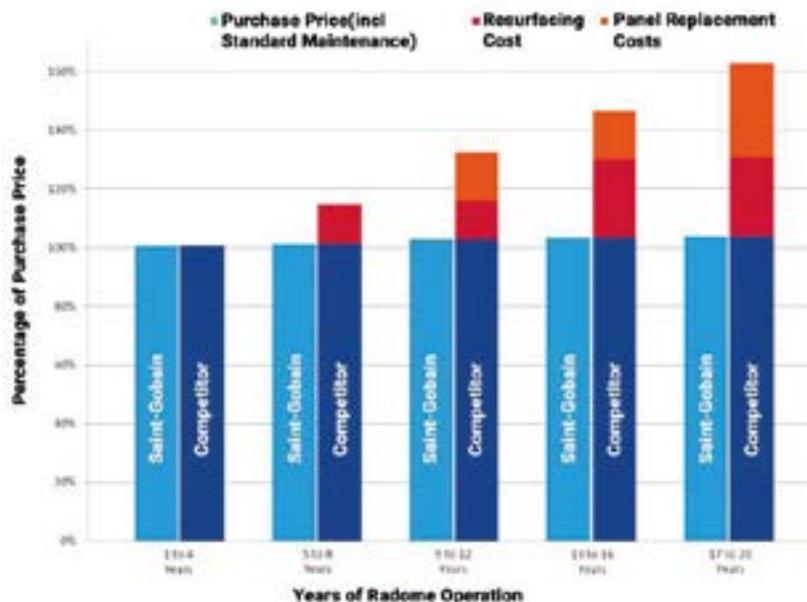
The material's PTFE coating provides superior life-long hydrophobic performance, so no reapplication of surface finish is ever required. As compared to other standard industry products, QUV testing has shown that only a fluoropolymer layer such as PTFE will provide this permanent hydrophobicity.

HOW WE REDUCE LIFE CYCLE COSTS

Life cycle costs of a radome can be best understood by their maintenance requirements. When radomes degrade, so does the system's performance and so maintenance work must take place to restore it back to its original condition.

These costs can be recognized as skilled labor, panel replacements, radome resurfacing and transportation. A traditional radome in the industry routinely faces delamination and hydrophobicity problems, requiring panel replacement or resurfacing efforts to return it to an operational state. Below shows a comparison of the life-cycle costs of two systems using end-user supplied data.

Over 20 years of service, all radomes require a small maintenance effort to ensure bolts remain tightened through standard operation. Through the invention of 3 dimensional reinforcements and the adoption of the PTFE surface from the air-supported product line, SHEERGARD® sandwich radomes are able to operate without panel replacements or surface repairs for their entire 20 year service life.

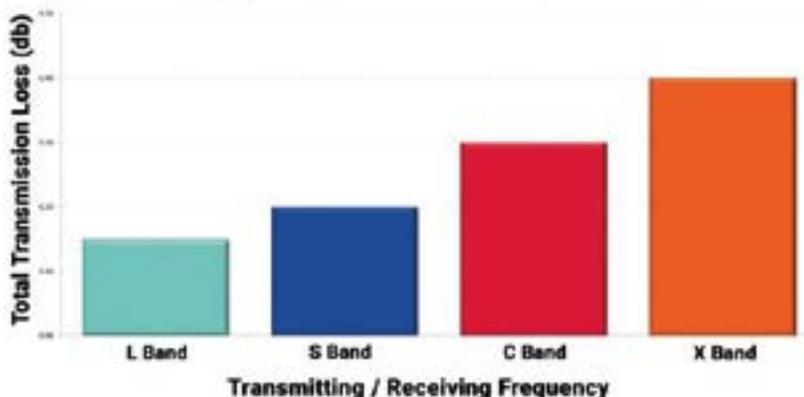


EM PERFORMANCE

A radome has one primary function: to protect a communication system from the environment while causing minimal electromagnetic degradation. In order to provide minimal degradation, a radome system is tuned to operate over a specific transmitting or receiving frequency. Any panel losses are controlled via material selection and core thickness, both of which are selected for the loading requirements at a particular site. Joint losses are controlled via modernized tuning analysis techniques to provide exceptional and unparalleled performance.

The typical electromagnetic performance of a SHEERGARD® radome can be found below. Please note, exact performance depends on both the specific operating frequency within each band and the radome's core thickness as per the structural requirements.

Typical Electromagnetic Performance of Tuned SHEERGARD Radomes



VARIETY OF SIZES AND TRUNCATIONS



SIZE OPTIONS AND CONFIGURATION

SHEERGARD® Sandwich radomes are available in many sizes and truncations to suit any site requirement.

Saint-Gobain uses in-house structural and electromagnetic design teams to provide the right solution.

Please contact us for a ROM, quotation, requests for further information, or visits from our technical sales teams.



**70+ YEARS OF
EXPERIENCE**

designing,
manufacturing
and servicing
radomes



ONE OF THE

100

MOST INNOVATIVE
COMPANIES
IN THE WORLD

PRESENCE IN

66

COUNTRIES

945

PRODUCTION
SITES

8

MAJOR R&D
CENTERS

1 IN 4

SAINT GOBAIN
PRODUCTS SOLD
TODAY WAS
DEVELOPED IN THE
LAST FIVE YEARS

SAINT-GOBAIN FILMS & FABRICS

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