

REFERENCES

HADR radome of the German Bundeswehr
near Marienbaum/Kalkar



Reconnaissance radome of the German Bundeswehr
on the mountain ridge „Hohenbogen“
(now privately owned as complex sektor.f)



Research radome of Nippon Antenna Co. Ltd. (EU) GmbH
near Itzehoe (today: Antenna Technology Center (Europe) ATC)



CONTACT

Hahlbrock GmbH – Faserverstärkte Kunststoffe
Wischhöfers Weg 6 – 7
31515 Wunstorf – Germany
phone: +49 (0) 5033 / 938 – 0
e-mail: info@hahlbrock.de
web: www.hahlbrock.de

Current approvals „security clearance SÜ2 - sabotage
protection“ for work in military security areas are available

Hahlbrock is certified in accordance with ISO 9001:2015
by TÜV Rheinland
Certificate No. 01 100 188024



Radar Antennas
highly protected in the long term

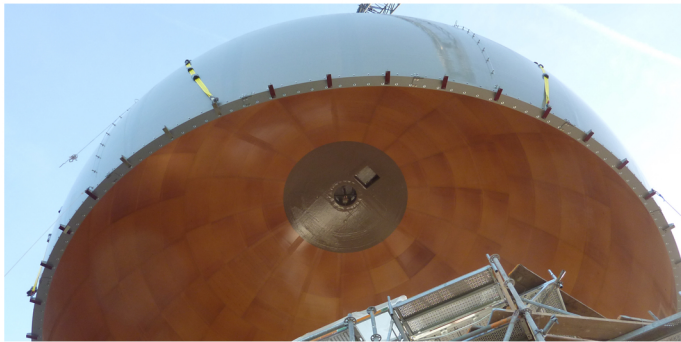


Picture by courtesy of German Bundeswehr

Large radomes
Antenna camouflage
Antenna windows
made of sandwich composites (GFRP)

RADOMES BY HAHLBROCK

Radomes and antenna camouflage must protect sensitive radar units and antennas against partly extreme weather conditions and unwanted observation over decades. Stresses – especially due to wind pressure, frost, UV exposure and, if applicable, snow load – at exposed installation sites are considerable for these shell-like lightweight constructions. Hahlbrock – Faserverstärkte Kunststoffe has more than 30 years of experience in the production of self-supporting large radomes and antenna camouflage made from fibre composites in sandwich construction as well as in the production of very thin and HF-permeable GFRP layers.



CONSTRUCTION

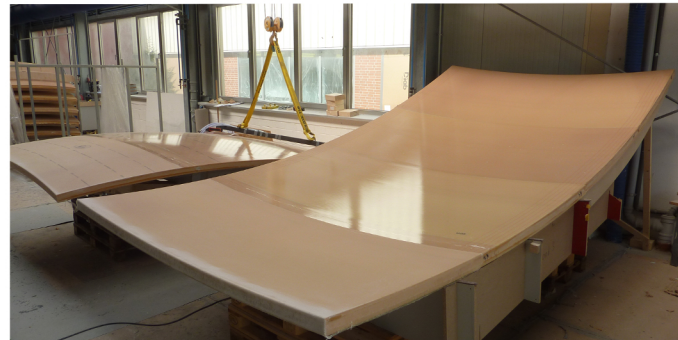
The lightweight, sufficiently rigid sandwich composites construction is very well suited for large, self-supporting shell structures used for spherical and cylindrical radomes. As this material composite must also have the lowest possible damping effect in relation to high frequency radiation in the GHz range, medium density foam made from PVC (density between 60 and 100 kg/m³) or PUR, if required, as well as thin cover layers made from glass fibre reinforced plastic (GFRP) are used.

Minimal damping can be achieved by adapting the wall structure (foam core and composite layers).

In case of a risk of heavy hail, using shock-resistant aramid fibre reinforced plastic (AFRP) on the outside of the radome may be useful.

By using a special consolidation procedure, Hahlbrock is able to produce fibre composite cover layers with great consistency with regard to their thickness and generally thinner than 1 mm for large-sized, convex sandwich segments. Butt joints between the components are executed in such a way that the same resistance of materials as in the radome component is given. A relevant impairment of the dielectric sandwich properties in the butt joint area is avoided by the joining process practiced by Hahlbrock as all metallic components such as screws etc. are not necessary for joining.

Of course, screwable flange joints may also be realised between the segments.

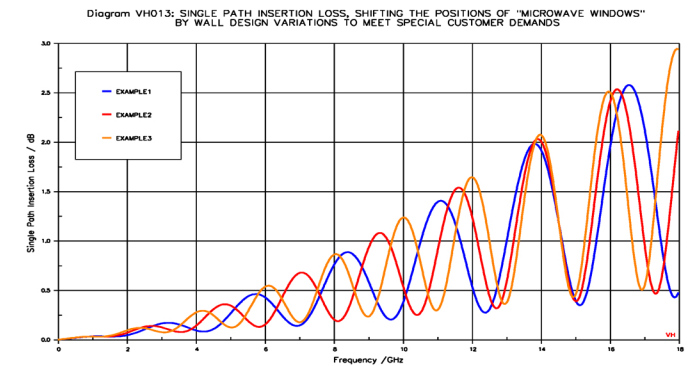


MATERIALS

- High-strength, closed-cell, unslotted PVC foams
- Glass fibre fabric or aramid fibre fabric
- Epoxy, vinyl ester or unsaturated polyester resin as a matrix
- Material and HF-compatible adhesives for sandwich core and segment butt joints
- Permanently weather and UV-resistant lacquers

OUR SERVICES

- Spherical, conical or cylindrical radomes with a diameter of 4 to over 26 m in segmental construction as well as special forms
- Large-sized planar and convex antenna windows and covers
- Calculation, construction, dielectric measurements



- Fire protection tests and mechanical material tests
- Production, custom-fit through CNC-assisted contour milling
- Production of foot ring mounting profiles and base skirts
- Integration of hatches, ventilation, lighting, lightning protection, flight obstruction lights, rotatable inspection platforms
- On-site assembly of radomes including scaffolding and lifting by mobile cranes
- Disassembly and disposal of old radomes
- Repair of existing GFRP radomes

