



**FLANN
MICROWAVE**

Unlocking the Power of Waveguide



Using our design, manufacturing and calibrating expertise to solve your waveguide problems for almost 70 years. Setting the global standard for precision, reliability and integrity.

Introduction



Flann Microwave Ltd is a global market-leading designer and manufacturer of precision passive RF, Microwave and Millimetric products, solutions and services. For almost 70 years Flann has set the bar for performance and reliability. Our workforce of 65 highly skilled engineers and professionals enable us to export 85% of turnover annually.

Flann produces critical components and sub-systems required to deliver, test, measure and calibrate systems operating from 300MHz to 1.1THz. Our technologies range from components such as: antennas, diplexers, adaptors, attenuators, switches, couplers, terminations, through custom waveguide assemblies to integrated networks.

As our markets move higher in frequency, our continual developments in mm-wave and sub mm-wave bands enable customers to meet the most challenging performance criteria.

Flann's on-going policy of maintaining the highest standards ensures that the Company's global reputation for quality, reliability and performance will continue into the future.



Reliable, Repeatable Precision

We're trusted by many of the World's National Test Facilities including NPL (UK), NIST (US), PTB (Germany) & more.

Products include:

- Horn Antennas
- Waveguide Switches
- Waveguide Calibration Kits
- Waveguide to Coaxial Transitions
- Precision Rotary Vane Attenuators
- High Frequency products up to 1.1THz

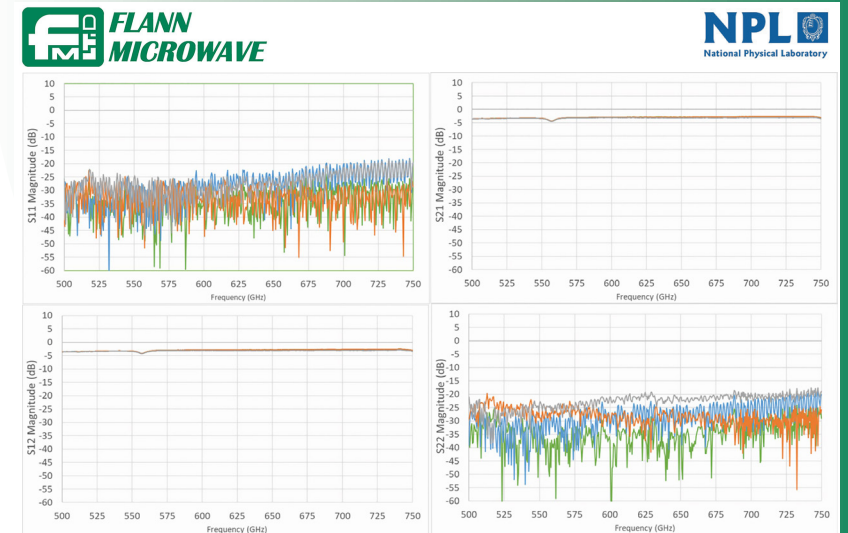
Our metrology grade Calibration kits are used as the 'Gold Standard' to verify/calibrate other manufacturers' waveguide product performance.



Moving to THz frequencies



We recently delivered a range of WM-250 (750GHz - 1.1THz) and WM-380 (500GHz - 750GHz) straights in lengths of 1 and 2 inches to the National Physical Laboratory (NPL). These are from our seamless semi-rigid range which is available in lengths up to 300mm with the possibility of forming complex bend and twist solutions.



Results: WM-380 Flann 2'' section - 4 connections in different orientations

6G Development

As humanity becomes ever more dependent on faster data transfer, our customers need us to undertake ever more challenging cutting edge projects. As our products continue to evolve, we find ourselves increasingly content living at the boundaries of waveguide performance.

5G is now being rolled out to many countries and 6G development is well underway; with an aim to begin deployment in 2030+. Flann are already providing high performance waveguide solutions to our customers' development laboratories.

Waveguide is the only solution able to support the power levels that 6G will require. As the waveguide expert, Flann's capability to supply products up to 1.1THz makes us an unparalleled partner in 6G development.

Throughout our history, Flann has developed many application specific products to overcome customer and industry challenges. Through continual close collaboration with market leaders in the telecoms sector, we've developed a range of new or improved products to meet the future trends of the 6G market.

To date, these products include:

- **Full band OMT**
- **Corrugated / Scalar Horns**
- **Compact Waveguide Switches**
- **Formable / Flexible Waveguide Solutions**
- **Sub-mm Seamless Waveguide**
- **Waveguide to Coax Transitions incl. 1.0mm & 0.8mm**
- **Filters / Diplexers / Multiplexers & more**





Waveguide Switch



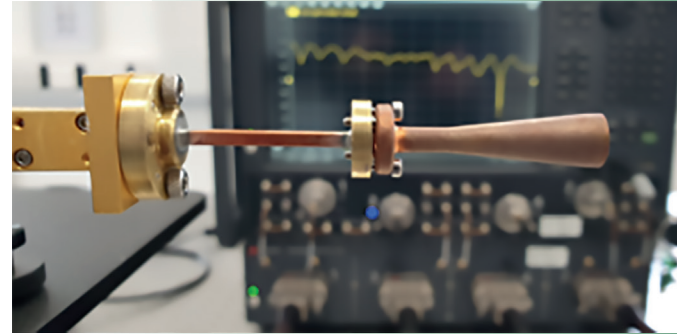
Antennas and Horns



Precision Rotary Attenuator

Additive Manufacturing

As telecoms frequencies increase, waveguide is currently the only practical option to make 6G viable. Flann are now utilising additive manufacturing techniques to overcome limitations with conventional machining, specifically for instruments such as corrugated horns.

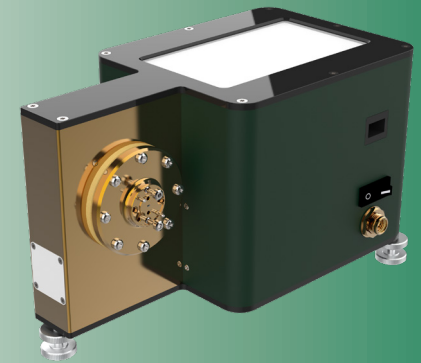


Ethernet Variable Attenuator

Our new range of Ethernet controlled Programmable Rotary Vane Attenuators replace the need for an external control processor and enable local or worldwide network connectivity.

High accuracy and repeatability are ensured by the use of a high resolution stepper motor and optical encoder. In addition to Ethernet control, a touchscreen readout allows user friendly manual operation.

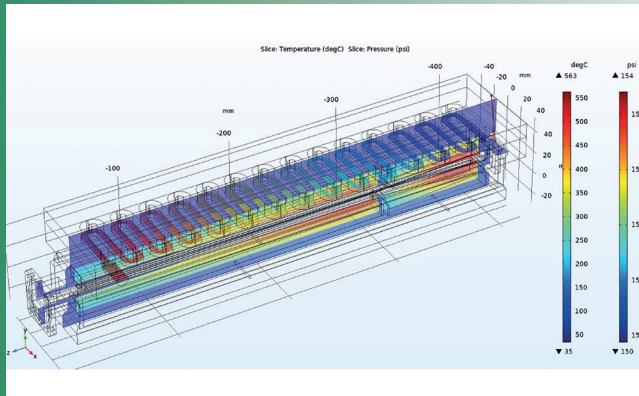
Models are available up to 500GHz



High Power

Ever more sectors are making use of higher powers for many different applications; whether this is for Satellite or Space Communications, Defence & Security or cutting-edge Research facilities.

We have been building our waveguide knowledge for almost 70 years. Combining this experience with the latest technology and software programmes, we are able to stretch the capabilities of waveguide to design, manufacture and validate high power solutions for many industries and applications.



Above is an image simulating the heat transfer through a water cooled high power termination when being used with 4.5kW mean power and under specific usage conditions.

Case Study:



Flann:

- **Performed the RF & mechanical modelling, analysis and design using 'state of the art' Electromagnetic, Physical, and Multi-Physics FEA (Finite Element Analysis) tools.**
- **Completed the mechanical design, taking care of issues surrounding: mechanical strength, centre of gravity, mounting and maneuvering of the finished assembly, heat dissipation and transfer, thermal stresses, weatherproofing and environmental aspects etc.**
- **Project managed the build, through a complex supply chain.**
- **Units have been demonstrated and successfully tested.**

The main challenges here were to develop an antenna and feed system that would work at (or beyond) the limit of what is theoretically possible from standard waveguide forms; be field-serviceable, transportable, mechanically compact and robust, and weatherproof.

Flann developed a custom waveguide topology and produced units that fulfilled the brief across a number of frequency bands. The technology is capable of working in a number of different environments including the latest, and most challenging version of the Antenna, which would be ship-borne and able to operate in the hostile marine environment.

Directed Energy Application

One of Flann's main objectives is to enable our customers to be successful. Often this results in our solving of problems that other suppliers aren't able to solve.

A recent case in point is a UK Defence Prime Contractor who needed an antenna for a very high-power directed energy application. The system is capable of bringing moving targets to a controlled stop at a safe distance, without collateral damage, in various environments.

Contact Sales via sales@flann.com or +44(0)1208 77777 for further information

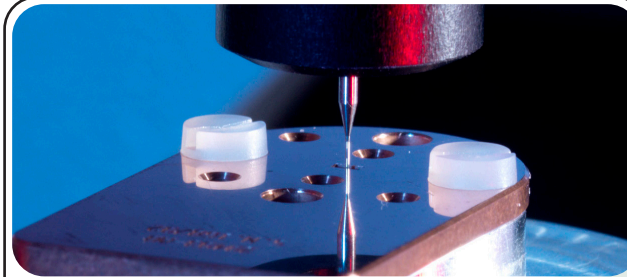
Market Applications



SATCOM & Spaceflight

Flann has been present in the SATCOM market for decades. Our journey into Spaceflight componentry began almost 10 years ago, and we now supply: JPL, Airbus, RAL Space & others.

- Waveguide Switches
- Couplers & Attenuators
- Complex Waveguide Solutions
- TVAC Compatible Components



Metrology, Test & Measurement, R&D & Academia

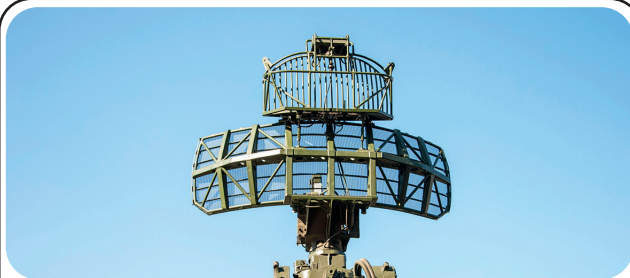
The Flann team has been working with IEEE Standards working group since it was formed in 2008, and the interface drawing of the standard was produced by Flann Mechanical Engineers. Evidence that Flann really deserves its place leading the development of Sub-mm wave technology.



Telecommunications 5G & 6G

The telecoms industry is consistently driving technological developments across Q/V, E, W, D & G-band. Our capability to supply products up to 1.1 THz makes us an unparalleled partner in 6G development.

- Antennas / Horns
- Diplexers / Filters
- Radio Testing Solutions
- High Precision Variable Attenuators



Aerospace & Defence

Defense & Military applications are always challenging. Our ability to customise products to offer high reliability across a range of environments is why we're trusted by the leading organisations in this sector.

- Antennas
- Waveguide Assemblies
- Complex Waveguide Systems
- High Power Solutions

Contact Us

If you have any waveguide problem which you need a solution for, then please contact our sales team who would be happy to discuss your enquiry with you.

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Security

Security screening methods are currently undergoing large technological advancements as new demands are being set to combat illegal activity. Flann are providing critical componentry to aid this cause.

- Attenuators
- Custom Waveguide Assemblies



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