



**FLANN MICROWAVE**

## Waveguide Calibration Kits

Series 708/730/750 – OOL 703/720/740 - TRL

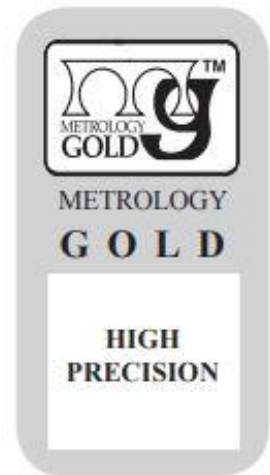
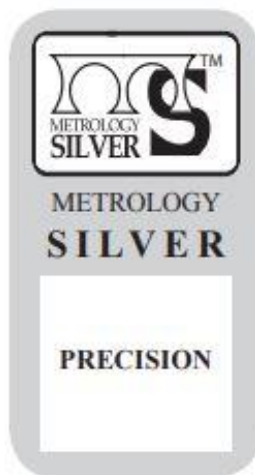
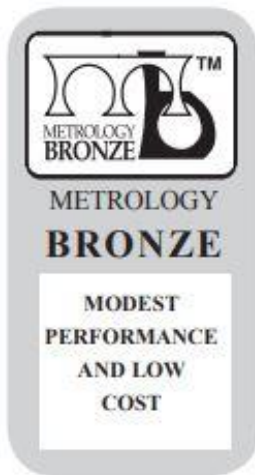
### Features

Three Grades, each with defined accuracy

For use with Vector Network Analysers – 1.14 GHz to 500 GHz.

Three grades of calibration kits and components are available that enable VNA users to select the one most suitable for the analyser type and measurement requirement. Various manufacturing techniques are employed and selected according to waveguide size and required accuracy.

Critical components in each grade of kit have defined accuracies – a feature unique to Flann Waveguide Calibration Kits. Flann calibration kits contain all the components necessary to fully calibrate VNAs configured for waveguide measurements. A typical kit would include waveguide to coax adaptors, fixed terminations, a sliding termination, offsets, flush shorts, and a waveguide section. Kits are supplied in a fitted hardwood case complete with connecting hardware, data disc and handbook.



### Model Selection Table

Kit Grade	Kit Type	
	OOL	TRL / LRL
<b>Metrology Bronze</b>	708 series	703 series
<b>Metrology Silver</b>	730 series	720 series
<b>Metrology Gold</b>	750 series	740 series

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## Specifications

Each kit type contains the following components

Components	Contents	
	OOL	TRL / LRL
<b>Waveguide to Coax Adaptors</b> <b>1.14 GHz to 22 GHz</b> <b>(WG6, WR650, R14) to (WG19, WR51, R180)</b>	2 off	2 off
<b>17.6 GHz to 110 GHz</b> <b>(WG20, WR42, R220) to (WG27, WR10, R900)</b>	2 off optional extra	2 off optional extra
<b>Fixed Termination</b>	2 off	2 off
<b>Flush Short</b>	2 off	2 off
<b>1/8 <math>\lambda</math> Offset</b>	1 off	optional extra
<b>1/4 <math>\lambda</math> Offset</b>	optional extra	1 off
<b>3/8 <math>\lambda</math> Offset</b>	1 off	optional extra
<b>Waveguide Section</b>	1 off	1 off
<b>Sliding Termination</b>	1 off	optional extra
<b>Data Disk</b>	included	included
<b>Torque Driver</b>	included	included
<b>Flange Bolts etc</b>	1 set included	1 set included
<b>Precision Flange dowels</b>	1 set included	1 set included
<b>Hardwood Case</b>	included	included
<b>Handbook</b>	included	included

### Note 1 – Flanges

Flann Calibration Kit components are fitted with “Precision Flanges” that are fully compatible with standard flanges whilst providing enhanced accuracy and repeatability.

Kits are also available fitted with alternative flange styles or special flanges to customer specification. Details on request.

### Note 2 – Waveguide to Coax Adaptors

The Waveguide to Coax Adaptors supplied with Flann Calibration Kits are of sufficient length to ensure the decay of unwanted evanescent modes.

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**Note 3 – Offsets**

The length of each Flann offset section is designed to provide a phase balanced response over the recommended frequency range. Fractional wavelengths are specified with respect to a wavelength  $\lambda_g^\circ$  where: -

$$\lambda_g^\circ = 2 \left[ \frac{\lambda_{ghf} \cdot \lambda_{glf}}{\lambda_{ghf} + \lambda_{glf}} \right]$$

$\lambda_{glf}$  is the waveguide wavelength at the lowest frequency of the operating range and  $\lambda_{ghf}$  is the waveguide wavelength at the highest frequency of the operating range.

**ORDERING INFORMATION REQUIRED**

1. Waveguide designation (size)

Example: WG27

2. Series selected

Example: 730 see above

3. Description

Example: Metrology Silver Grade, OOL type

4. Vector analysers to be used

Example: HP8513

**Complete Ordering Example: 27730 Metrology Silver Waveguide Calibration Kit type OOL for use with HP8513 vector network analysers**

**Please Note: Calibration Kits in WG 20 and higher frequencies (17.6 GHz upwards) do not include Waveguide to Coax Adaptors. Please state at time of ordering if adaptors are required to be included in the kit.**

Flann Calibration Kits have been developed in close cooperation with manufacturers and users of network analysers. Kits are available in each of the three grades, suitable for analyser configurations requiring OOL, TRL and LRL calibration kit styles. The selection of a calibration kit and its contents is largely dictated by the combination of analyser model, test set model and type of calibration routine to be implemented, i.e. full 12 term, single path 2 port, reflection only or TRL/LRL.

**OOL – Offset/Offset/Load**

**TRL – Thru/Reflect/Line**

**LRL – Line/Reflect/Line**

The waveguide Calibration Kits contain the components necessary to fully calibrate Vector Network Analysers. Flann Calibration Kit components are available individually or to supplement standard kits. Specialised Calibration Kits or components for use with alternative measurement systems, such as six port reflectometers, are also available. Full details are available on request.

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Note: The components included in Flann Offset/Offset/Load type calibration kits can also be used with the Anritsu/Wiltron 360 to achieve an LRL calibration.

The specifications and capabilities of network analysers are subject to constant evolution and development. Please consult us for Calibration Kit applications assistance if required.

### Note 1 – Flanges

Flann Calibration Kit components are fitted with “Precision Flanges” that are fully compatible with standard flanges whilst providing enhanced accuracy and repeatability. Kits are also available fitted with alternative flange styles or special flanges to customer specification. Details on request.

### Note 2 – Waveguide to Coax Adaptors

The Waveguide to Coax Adaptors supplied with Flann Calibration Kits are of sufficient length to ensure the decay of unwanted evanescent modes.

### Note 3 – Corner Radius

Calibration Kits with specified corner radius are available – please contact our Sales Department for more details

Please Note: Calibration Kits in WG 20 and higher frequency sets (17.6 GHz upwards) do not include waveguide to coax adaptors.

Please state at time of ordering if adaptors will be required.

Double Ridge Waveguide Calibration Kits are also available

#### ORDERING INFORMATION

Calibration Kit Model: model of specific analyser model with which Calibration Kit is to be used; Description

Example: Model 22730-HP8513 waveguide calibration kit, metrology silver, OOL, for use with HP 8513 analyser

### Custom Design

Custom built instruments can be supplied; please contact the sales team for more information

[sales@flann.com](mailto:sales@flann.com)

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