# FLEXIBLE SEAMLESS WAVEGUIDE

## MATERIAL:

*Waveguide*:

- Brass 70/30 CuZn30
  Standards: ISS IS407, ASTM C26000 (USA)
- Brass 80/20 CuZn20
  Standard: ASTM C27000 (USA)
- Beryllium Copper CuBe Alloy
  Standard: UNS C17200 Alloy 25, ASTM B643 AMS 4535 QQ-C 530
- Phosphorous Bronze CuZn8
  Standard: ASTM C52100 Grade 104 (USA)

*Flanges*: Brass 58
MICROWAVEFILTERS offers a wide variety of flanges including European "154 IEC" standard, American MIL specification "UG" flanges and American EIA "CPR" types. Special flanges can be supplied upon request.

## MANUFACTURING PROCESS:

Seamless waveguides are manufactured by convoluting and forming a metal tube so it will flex in the E and H planes only. The seamless construction generally allows for greater power and pressure handing although length is limited to 1 meter.
The above-mentioned components are assembled together through the operations of soldering/brazing (according to specifications Castolin 157).

## OPERATING TEMPERATURE RANGES:

-55 °C to +145 °C.

## SURFACE TREATMENTS:

*Internal protection*:
*Waveguide*: silverplating
*Flanges*: brightening passivation according to European Directives 2002/95/EC (“RoHS”) and 2003/11/EC.

*External protection*:
*Waveguide*: silicone rubber covering according to MIL-S23586
*Flanges*: catalytic epoxy painting (colour RAL 9005)

**MICROWAVEFILTERS & TVC S.r.l.**
Via G. Cavalcanti, 10 - 20063 Cernusco sul Naviglio (MI) ITALY - Tel.+39.02.92162703 - +39.02.92729987 - Fax +39.02.92162705 - info@microwavefilters.it - www.microwavefilters .it

## SUPPLIED MATERIAL:

The product (waveguide + flanges) will be supplied together with:

- flange mounting kit, composed of: AISI 303 stainless steel screws (all thread) + elastic washers + hexagonal nuts and gasket (if necessary);
- label on the waveguide with: our logo + our product code + frequency of use.

The product and the mounting kit will be delivered in a single anti-collision box together with our certificate of compliance.

## PRODUCTION CONTROL:

MICROWAVEFILTERS' quality control guarantees that components are compliant with the electrical and mechanical characteristics reported below. This is possible thanks to strict tests carried out in all the manufacturing steps up to the final acceptance control, which is performed on each product using our Vector Network Analyzers.

All products are supplied with the technical documentation enclosed about the electrical and mechanical tests performed.

## LENGTH

Standard lengths: 300 – 600 – 900 mm.
Other lengths are available upon request up to a maximum of 1000 mm (±50 mm).
Advantage: minor reject of production, and by consequence saving costs; possibility of producing single straight component with maximum dimensions.

## OTHER CHARACTERISTICS

1. Strait and repetitive tolerance on extern dimensions ±0,3 mm.
   Advantage: according to the part of supply, for welding the waveguide, the dimensions of the flange don't have to be corrected continuosly.

2. No twistable on the diagonal axis of the guide, in all his lengths.
   Advantage: easy alignment is corrected by the flange during the welding.

3. No strain or deformity of the material during the formation of folding.
   Advantage: good mechanical resistance on the repeated vibrations.

4. High flexibility
   Advantage: Possibility of bending the guide on two planes E and H, also on reduced radius ( permanent deformation), without changing the VSWR value and the insertion loss IL. The internal dimensions and internal radius of curving is meticulous studied so that the value of the V.S.W.R. is the lowest possible in all theFrequency of production.

**MICROWAVEFILTERS & TVC S.r.l.**
Via G. Cavalcanti, 10 - 20063 Cernusco sul Naviglio (MI) ITALY - Tel.+39.02.92162703 - +39.02.92729987 - Fax +39.02.92162705 - info@microwavefilters.it - www.microwavefilters .it

# Electrical Characteristics

| IEC R | EIA WR | Frequency Range (GHz) | Return Loss (dB) | | | IL | CW Power | Peak Power |
|---|---|---|---|---|---|---|---|---|
| | | | 300 mm | 600 mm | 1000 mm | dB/m | Watt | kW |
| 32 | 284 | 2.6 – 3.95 | 30.7 | 29.4 | 28.3 | 0.12 | 4000 | 2000 |
| 40 | 229 | 3.22 – 4.90 | 30.7 | 29.4 | 28.3 | 0.14 | 4000 | 1550 |
| 48 | 187 | 3.94 – 5.99 | 29.4 | 27.3 | 26.4 | 0.17 | 3000 | 1250 |
| 58 | 159 | 4.64 – 7.05 | 29.4 | 27.3 | 26.4 | 0.22 | 2500 | 1100 |
| 70 | 137 | 5.38 – 8.18 | 29.4 | 27.3 | 26.4 | 0.30 | 2000 | 500 |
| 84 | 112 | 6.58 – 10.0 | 28.3 | 26.4 | 25.7 | 0.36 | 1500 | 315 |
| 100 | 90 | 8.20 – 12.5 | 28.3 | 26.4 | 25.7 | 0.42 | 1000 | 180 |
| 120 | 75 | 9.84 – 15.0 | 27.3 | 25.7 | 24.9 | 0.55 | 750 | 140 |
| 140 | 62 | 11.9 – 18.0 | 27.3 | 25.7 | 24.3 | 0.90 | 400 | 100 |
| 180 | 51 | 14.5 – 22.0 | 24.9 | 23.7 | 23.1 | 1.45 | 200 | 70 |
| 220 | 42 | 17.6 – 26.7 | 23.0 | 22.1 | 20.1 | 2.00 | 100 | 39 |
| 260 | 34 | 21.7 – 33.0 | 21.7 | 20.8 | 19.4 | 2.40 | 100 | 30 |
| 320 | 28 | 26.4 – 40.1 | 21.0 | 19.7 | 18.8 | 2.70 | 75 | 20 |
| 400 | 22 | 33.0 – 50.1 | 18.0 | 16.5 | 16.0 | 2.80 | 25 | 12 |

**MICROWAVEFILTERS & TVC S.r.l.**
Via G. Cavalcanti, 10 - 20063 Cernusco sul Naviglio (MI) ITALY - Tel.+39.02.92162703 - +39.02.92729987 - Fax +39.02.92162705 - info@microwavefilters.it - www.microwavefilters .it

# Mechanical Characteristics

| IEC R | EIA WR | Minimum Center Line Bending Radii | | |
|---|---|---|---|---|
| | | Static E-Plane (mm) | Static H-Plane (mm) | Pressure (mbar) |
| 32 | 284 | 177 | 241 | ≥ 400 |
| 40 | 229 | 165 | 203 | ≥ 400 |
| 48 | 187 | 111 | 165 | ≥ 400 |
| 58 | 159 | 101 | 152 | ≥ 400 |
| 70 | 137 | 60 | 85 | ≥ 400 |
| 84 | 112 | 57 | 82 | ≥ 400 |
| 100 | 90 | 44 | 63 | ≥ 400 |
| 120 | 75 | 28 | 57 | ≥ 400 |
| 140 | 62 | 25 | 47 | ≥ 400 |
| 180 | 51 | 22 | 31 | ≥ 400 |
| 220 | 42 | 22 | 31 | ≥ 400 |
| 260 | 34 | 19 | 28 | ≥ 400 |
| 320 | 28 | 19 | 28 | ≥ 400 |
| 400 | 22 | 19 | 28 | ≥ 400 |

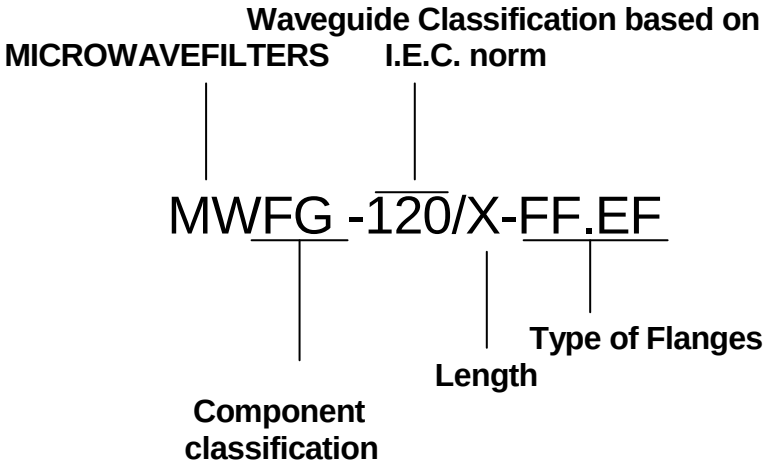
**MICROWAVEFILTERS & TVC S.r.l.**
Via G. Cavalcanti, 10 - 20063 Cernusco sul Naviglio (MI) ITALY - Tel.+39.02.92162703 - +39.02.92729987 - Fax +39.02.92162705 - info@microwavefilters.it - www.microwavefilters .it

## CONNECTION FLANGES FOR THE SEAMLESS WAVEGUIDE

| IEC | EIA | RSC | Sigla d'impiego | Description of use |
|---|---|---|---|---|
| R 40 | WR 229 | WG 11A | **UERF-UDRF PDRF** | **UERF**= rectangular section for flexible waveguide (for indoor)<br>**UDRF**= rectangular section for flexible waveguide (for outdoor)<br>**PDRF**= rectangular section for flexible waveguide (for outdoor with gasket)<br>**UBRF**= square section for flexible waveguide (for indoor and outdoor)<br>**PBRF**= square section for flexible waveguide (for indoor and outdoor with gasket)<br><br>MICROWAVEFILTERS CLASSIFICATION:<br><br>**AF = UERF**<br>**BF = UARF**<br>**CF = PARF**<br>**DF = UDRF**<br>**EF = PDRF**<br>**FF = UBRF**<br>**GF = PBRF** |
| R 48 | WR 187 | WG 12 | **UERF-UDRF PDRF** | |
| R 70 | WR 137 | WG 14 | **UERF-UDRF PDRF** | |
| R 84 | WR 112 | WG 15 | **UDRF-PDRF UBRF-PBRF** | |
| R 100 | WR 90 | WG 16 | **UDRF-PDRF UBRF-PBRF** | |
| R 120 | WR 75 | WG 17 | **UDRF-PDRF UBRF-PBRF** | |
| R 140 | WR 62 | WG 18 | **UDRF-PDRF UBRF-PBRF** | |
| R 180 | WR 51 | WG 19 | **UDRF-PDRF UBRF-PBRF** | |
| R 220 | WR 42 | WG 20 | **UBRF-PBRF** | |
| R 320 | WR 28 | WG 22 | **UBRF-PBRF** | |

**MICROWAVEFILTERS & TVC S.r.l.**
Via G. Cavalcanti, 10 - 20063 Cernusco sul Naviglio (MI) ITALY - Tel.+39.02.92162703 - +39.02.92729987 - Fax +39.02.92162705 - info@microwavefilters.it - www.microwavefilters .it

## HOW TO CREATE THE CODE FOR THE FLEXIBLE AND SEAMLESS WAVEGUIDE COMPONENTS




**Example:**
**The MWFG-120/X-FF.EF code is for a flexible seamless straight R120 waveguide adapter, rubber-coated, with flanges UBRF - PDRF and length X.**

Document Revision: **03** dated 11/01/13

**MICROWAVEFILTERS & TVC S.r.l.**
Via G. Cavalcanti, 10 - 20063 Cernusco sul Naviglio (MI) ITALY - Tel.+39.02.92162703 - +39.02.92729987 - Fax +39.02.92162705 - info@microwavefilters.it - www.microwavefilters .it