

The Narda Microwave Corporation  
**Standard Practice Manual**

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TITLE: GENERAL REQUIREMENTS FOR FABRICATED PARTS  
PROCEDURE: SPM1009

1.0 **PURPOSE**

To provide information that is not otherwise specified on Narda engineering documents.

2.0 **SCOPE**

This procedure defines the general requirement that must be followed during fabrication and inspection of fabricated parts.

3.0 **RESPONSIBILITY**

The Manufacturing Engineering and Quality Assurance Departments shall coordinate and define these requirements.

Permission for exceptions to any of the foregoing must be approved by documented concurrence of both Narda Engineering and Quality Assurance.

4.0 **MACHINED SURFACES**

4.1 All surfaces, regardless of tolerance, must be free from nicks, burrs, scratches, deep tool marks, cutoff tits, material defects, and foreign inclusions that are obvious from a visual inspection, except where noted as acceptable.

4.1.1 Cutoff tits not exceeding .005" in length will be acceptable only when the piece part is completely fabricated during an Automatic Screw Machine Cycle. The part, including the tit, must be within print tolerance.

The Drawing will callout if the cutoff tit is not acceptable.

4.2 No silicon based cutting fluids to be used during machining on any metal parts that will be electroplated. No silicon based emery cloth to be used for deburring purposes on any metal parts that will be electroplated. No glass bead to be used on any metal parts for any blasting purposes prior to electroplating.

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**5.0 SURFACE FINISHES**

- 5.1 All fractional tolerances 125 RMS or better.
- 5.2 With total tolerances of .0011 to .010 63 RMS or better.
- 5.3 With total tolerances of .001 or less 32 RMS or better.
- 5.4 External coupling threads of stainless steel connectors 32 RMS or better.
- 5.5 All Waveguide flanges 63 RMS or better.
- 5.6 After machining all brazed joints of coaxial and Waveguide components must be free from pinholes, foreign inclusions, and other similar defects.

**6.0 CORNERS AND EDGES**

- 6.1 The terms "Sharp Corner", "Sharp Edge" or "Corners and Edges" pictorial represented as Sharp, denote a chamfer or radius from .000 to .005.
- 6.2 The term "Break Edge" denotes a chamfer or radius of form .005 to .015.
- 6.3 The term "Break Edge .xxx Max" defaults to a min of .005 chamfer or radius.
- 6.4 All laser covers fabricated from 4047 Aluminum, 12% Silicon shall have all burrs removed, edges to be sharp.

**7.0 TOLERANCES**

- 7.1 A linear tolerance of plus or minus .005" applies as follows:
  - 7.1.1 Location of holes on the same center line.
  - 7.1.2 Location of holes on intersecting centerlines.
  - 7.1.3 Surfaces shown in the same plane.
  - 7.1.4 Centerline locations of holes at angular designations as applied to their calculated coordinate locations.

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7.2 Tolerances relating to inside diameters, unless otherwise specified.

7.2.1 Fractional diameter call out on drawing is  $\pm .005$ .

7.2.2 Drilled

<u>Diameter (in.)</u>		<u>Tolerance (in.)</u>
<u>From</u>	<u>To.</u>	
.0135	.0420	+ .003 - .002
.0430	.0930	+ .004 - .002
.0935	.1560	+ .005 - .002
.1562	.2656	+ .006 - .002
.2660	.4219	+ .007 - .002
.4375	.6094	+ .008 - .002
.6250	.8437	+ .009 - .003
.8594	2.000	+ .010 - .003

7.2.3 Hand Reamed

<u>Diameter (in.)</u>		<u>Tolerance (in.)</u>
<u>From</u>	<u>To.</u>	
.005	.500	+ .0005 - .0005
.50	1.000	+ .0010 - .0010
1.00	2.000	+ .0020 - .0020

7.2.4 Machined Reamed

<u>Diameter (in.)</u>		<u>Tolerance (in.)</u>
<u>From</u>	<u>To.</u>	
.005	.500	+ .0010 - .0010
.501	1.000	+ .0010 - .0015
1.001	2.000	+ .0020 - .0020

7.3 Tolerances for Concentricity, Parallelism, Squareness, Flatness, and Straightness.

7.3.1 Excepting Waveguide and Coaxial Components tolerance must not exceed the arithmetic sum of the related dimensional tolerances.

7.3.1.1 Max. allowable deviation of squareness and parallelism shall not exceed .003"/". The angular tolerance specified in print title

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block does not apply to squareness or parallelism unless it is less than .003"/" (0° - 10°). In that case the print tolerance must be held.

7.3.1.2 All tolerances are TIR.

7.3.2 The following applies ONLY to Waveguide and Coaxial components.

7.3.2.1 Parallelism of flange faces to be to be within .001"/".

7.3.2.2 Flatness of flange faces to be to be within .0002"/".

7.3.2.3 Squareness of flange faces to be within .001"/".

7.4 Unless specified on the engineering drawing, dimensional limits and surface roughness designations apply after the application of finishes such as plating, chromate conversion coatings, oxides, etc., and after heat treatment. No allowance is to be made for plating unless before and after dimensions are called out on either drawings or operation sheets.

7.5 Where organic finishes such as Lacquers, Varnishes, Enamels, Primers are used, dimensional limits and surface roughness designations apply before application of the organic finish.

7.6 All undimensioned features are +/- .005" unless otherwise specified.

## 8.0 HOLES

8.1 Blind hole depth refers to the depth of the cylindrical portion only.

8.2 Threaded holes, which do not have a specified thread relief, shall have complete fully formed threads for the specified thread length and any incomplete threads shall fall beyond the specified thread length.

8.3 Breakthru permissible unless otherwise specified on drawing.

8.4 All holes and/or cavities shall be inspected with a lighted magnification aid of 10X minimum.

8.5 All plated through holes with diameters  $\leq .015$  shall be inspected per 8.4 above

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for excess plating burrs and gold flash.

8.6 MFT=Minimal Full Thread.

8.7 Unless noted holes will be through.

9.0 **THREADS**

9.1 The outer end of external threads shall have a  $45^\circ \pm 5^\circ$  chamfer to the root diameter  $\pm .005$ . If threads end in a thread relief (undercut), that end shall also be chamfered.

9.2 Internal threads shall have a  $45^\circ \pm 5^\circ$  chamfer to the major diameter,  $\pm .005$ . If it is a through-hole, only the end into which the mating screw is inserted need be chamfered, but it is permissible to chamfer both ends.

9.3 Internal threads - blind holes, see 5.2.

10.0 **ELECTRONIC FILES**

10.1 When stated on the drawing electronic DXF files maybe used to fabricate the part.

10.2 All dimensions on drawing shall be inspected and are subject to validation during source inspection (where applicable).

11.0 **VENDOR REWORKS**

11.1 No supplier has sole MRB authority for repair/rework. Narda must approve prior to commencing.

11.2 All parameters that exceed Narda documentation applicable to the purchase order must be submitted to Narda via a "Supplier Deviation Request". A copy of the approved requests shall accompany all shipments. Non-conforming material shall not be shipped before approval, must be properly identified and segregated if shipped with conforming product.