

Aerospace Operations 40-60 Delaware St. Sidney, NY 13838-1395		MACHINING	Part No. PR301
Quality Approval: HANEY	Quality Standards		Operation No. Revision: 03/04/2015 PAGE 1
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	Definitions		

Blisters/Pimples

A condition that is the result of internal gas release or air pockets evidenced by the appearance of a bump.

Chips

Small nicks along edges of part or small pieces broken off from the edge.

Closed Knit Line

A visible material flow line having no perceptible depth.

Color Uniformity

Surface color varying in uniformity resulting in spots, blotches and striations of different color.

Contamination

An inclusion of foreign material detectable on the surface of the part.

Cracks

A fracture passing completely through the thickness or section of a part.

Crazing

Fine surface cracks appearing as a network of interconnecting hairline cracks on the surface.

Cut

Material severed or damaged as a result of piercing or slicing action with a sharp instrument or tool.

Deformed

A departure from the normal shape greater than the dimensional tolerance. Parts often deform out of round, out of square, twisted, warped, bent or flattened.

Dent

A depression with no removal of material or change in surface texture.

Dry Spot

An area on the surface of the part where reinforcement has not been wetted with resin, usually distinguished by the presence of loose fibers.

Flash

Excess material adhering to part.

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		Definitions	

Gouges

The result of scooping out of material by another object.

Mutilation

May consist of any combination of a gouge, cut, nick, tear, porosity and other abnormal material conditions that result in the part exhibiting a non uniform appearance.

Nicks

Sharp surface indentation caused by impact of a foreign object. Parent material is normally displaced, seldom separated.

Non-fill / Void

An incomplete part due to insufficient material.

Pit / Pinhole

A small sharply defined hole in the surface of the part.

Porosity

Multiple pits or pin holes

Scratch

A mark on the surface of the part that displaced material producing a depression in to the surface.

Scuff

A mark caused by an abrasion which changes the surface smoothness or texture.

Sink Marks

A dimple like depression in surface of part.

Surface Cracks

A fracture on surface of part that does not go completely through thickness of part.

Surface Discoloration

An apparent surface inconsistency in material evidenced by the appearance of light to dark streaks.

Tear

Separation of material due to mechanical stress.

Wire Marks

Visible marks caused by the part having rested against the curing trays.

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	SURFACE FINISH		

This Quality Standard is applicable to all metallic parts for which the drawing does not specify a surface finish requirement. See Thread Surface Texture Standard page 6 of this document.

Unless otherwise specified, the following maximum allowable average surface roughness R_a shall apply:

<u>Drawing Tolerance</u>	<u>R_a</u>
Up to and including .001	63 max.
Over .001	125 max.

The following exceptions apply:

Connector Flange Face	63 max.
Cable Ferrule & Adapter Seats	63 max.
Die Cut and Sheared Surfaces, These surfaces shall have no sharp edges	750 max.

A surface from which two or more differently toleranced dimensions originate shall reflect the maximum surface finish allowable of the greater tolerance.

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	SEALING SURFACE SURFACE FINISH		

This Quality Standard is applicable to Plug shells unless otherwise specified by drawing or specification.

The area covered by this criteria is defined as the surface of the plug, which when in the mated condition, seats against the sealing gasket of the receptacle.

Acceptable Imperfections:

1. Imperfections (nicks, scratches, dents, raised material) not exceeding .010 inch in depth provided they do not extend across the entire surface.
2. Imperfections (nicks, scratches, dents, raised material) not exceeding .005 inch in depth may extend across the entire surface.

{Note: based upon a memo dated 22-May-01 from L.Krantz, A.Schildkraut, A.Davis: Rational: }
 {gasket is under 50% compression. With this compression, the gasket wraps around the leading edge }
 {of the shell where this criteria is being imposed. }

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	THREAD SURFACE TEXTURE (CUT or GROUND THREADS)		

(Based on Federal Standard H28)

1. The threads shall have a smooth finish and be free from flaws and other defects, such as nicks, tears and burrs that would make them unsuitable for the purpose intended.
2. All required gauges must fit the thread.
3. Surface texture of threads shall not exceed 100 microinch average roughness for cut threads and 63 microinch for rolled and ground threads.
(Note: for comparison purposes only, a normal sheet of white copier paper has a surface finish of 85 to 110).
4. This standard applies to threads produced or processed by:
MACHINING, MOLDING AND PLATING.

Note: See the DIE CAST workmanship Standards for threads produced by or on Die Cast products that are non H28, (example: AN 5015 style).

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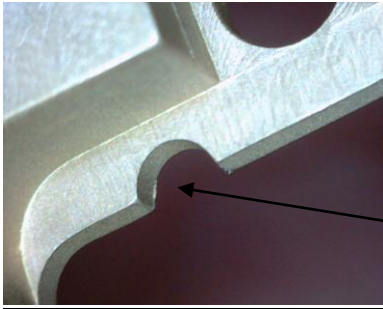
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Quality Approval: HANEY NEUBERGER	Quality Standards		Operation No. Revision : 3/17/2016 PAGE 7
	BURRS		

This Quality Standard applies to all metallic parts unless otherwise specified by drawing or specification.

BURR: SHARP PROJECTIONS OR EXCESS MATERIAL LOCATED ON THE EDGES OR CORNERS OF PARENT MATERIAL.

ACCEPTABLE Imperfections:

1. Excess material is acceptable provided it is firmly attached, .003 or less in size prior to plating, and does not impair the proper function of the end product or exceed the applicable engineering drawing parameters.
2. If a specific situation is deemed questionable, then Quality Engineering will review and with consultation with Design Engineering as required, can accept the product as is, provided the functionality of the product and system integrity will not be jeopardized.



Burr shown in photograph is not cause for rejection as it is firmly attached and less than .003".

UNACCEPTABLE Imperfections:

1. Lightly attached excess material on any surface is not acceptable.
2. External excess material, sharp enough to cut hand, is not acceptable.
3. Open recess under excess material, where the bottom of the recess is not visible, is not acceptable.
4. Visible excess material that cannot be inspected as being firmly attached is not acceptable.
5. Burrs in functional areas of mating keyways are not acceptable.



Burs are loose and greater than .003

Note: Any changes to this standard must also be made to the following documents: 9-3800 S9-3800

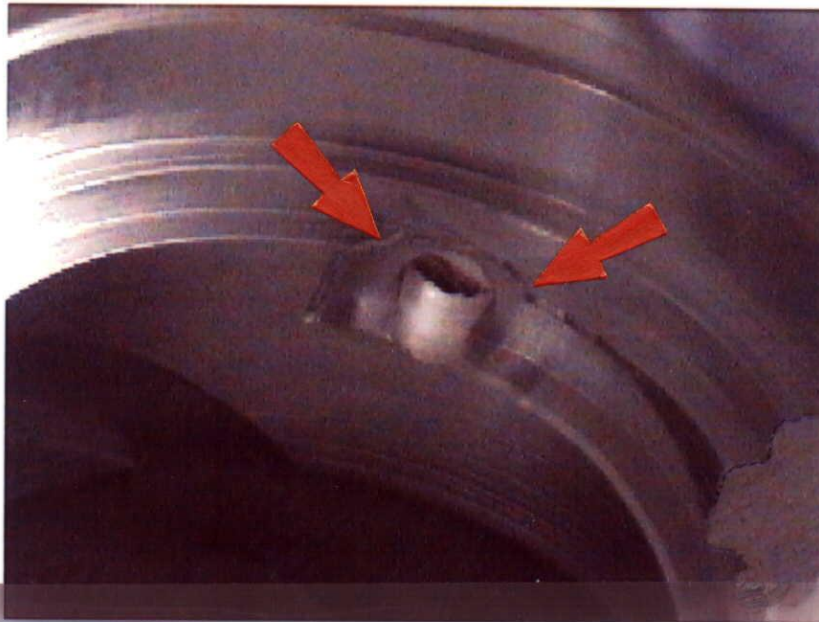
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	COUPLING NUT		

Acceptable

1. Machine marks in non-functional areas are allowed within surface finish requirements.
2. Break thru on coupling ramp is allowable per blue print tolerance provided loose material is removed.
(see photo below)



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Quality Approval: HANEY	Quality Standards KNURL / FLUTE on Coupling Nuts		Revision: 6/03/2005 PAGE 9

This Quality Standard is applicable to coupling nut surfaces containing knurls/flutes used as gripping surfaces, unless otherwise specified by drawing or specification.

The area covered by this criteria is defined as the finished surface area of the knurl/flute.

ACCEPTABLE IMPERFECTIONS:

1. Those imperfections that do not violate the depth of the knurl/flute and do not affect form, fit, or function.

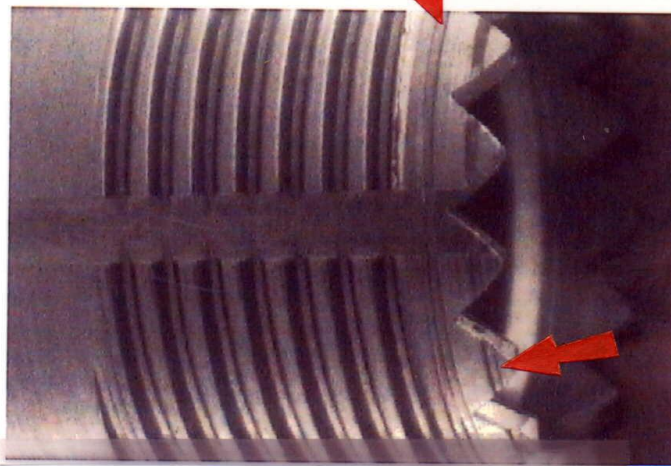
UNACCEPTABLE IMPERFECTIONS:

1. Those imperfections that result in detrimental or hazardous burrs.
2. Those imperfections that protrude beyond the area of the knurl/flute.

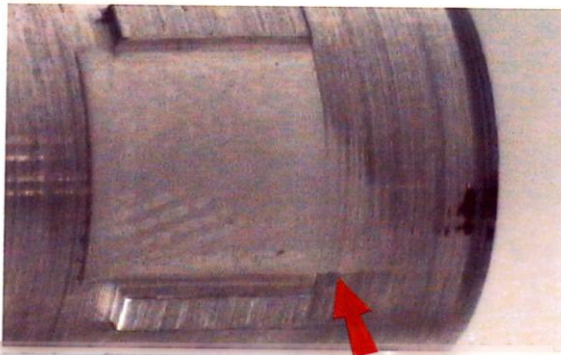
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	SHELLS		

1. Unless otherwise specified, thread marks on pilot are permissible provided they do not exceed .003 max deep by .005 max wide.



2. Unless otherwise specified, tool marks, due to key - shaving on O.D. in front of the keys on plug shells are permissible to the extent that no sharp steps are formed in front of the keys and the outside diameter is within tolerance.

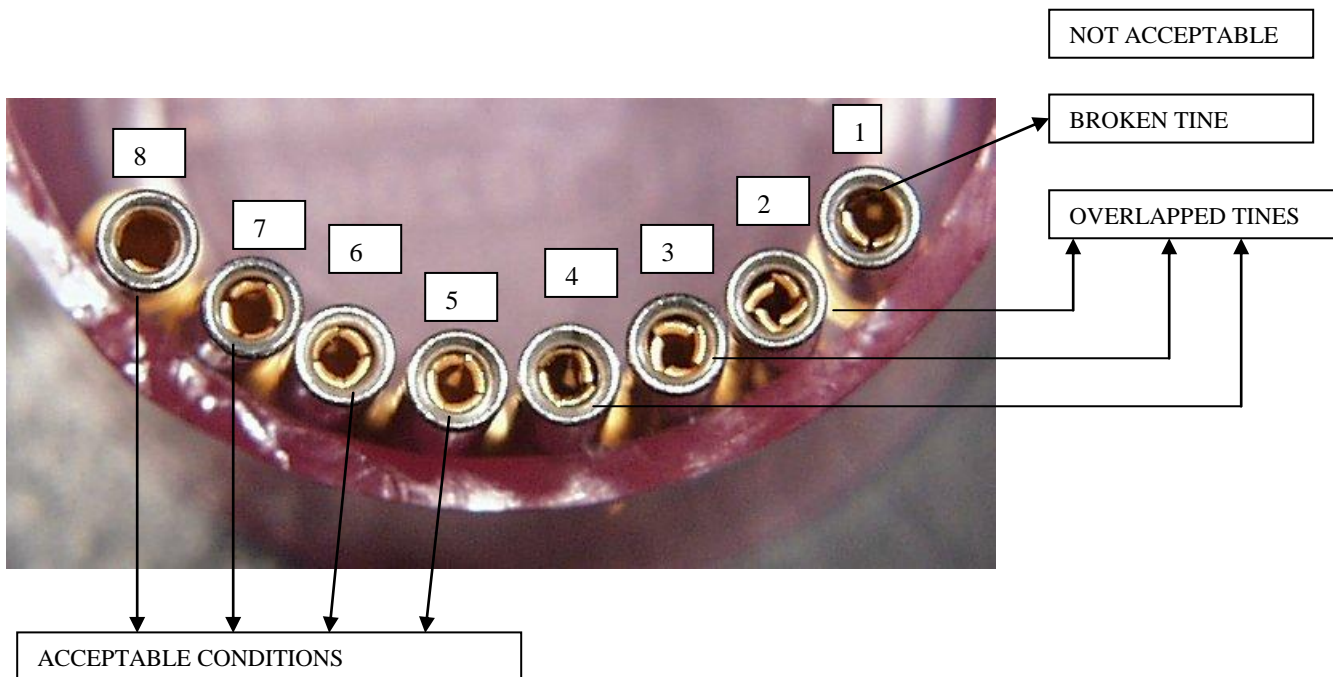


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	SOCKET CONTACT TINES		Revision 06/03/2005 PAGE 11

The locational relationship of the socket tines to each other can effect the Engagement and Separation Forces that the socket contact will exhibit. The following paragraph states the basic requirement that socket contact tines should exhibit. The photograph displays various conditions that may be encountered and the accept or reject decision that should be applied to that condition.

Socket tines should form an approximate circle when viewed through the ID of the assembled hood. Any tine that is bent forward from that circle towards the center by at least the thickness of the tine shall be cause for rejection. Any tines that are overlapped, broken or missing shall be cause for rejection.



The photo shows 8 contacts from the socket hood end.
 The #1 contact on the far right is missing one tine, broken off, which is a reject.
 From the right; contacts # 2, 3, 4 have overlapped tines which are rejects.
 From the right; contacts #5, 6, 7, 8 are acceptable.

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Quality Approval: HANEY	Quality Standards THREAD MEASUREMENT TECHNIQUE (PLATED vs UNPLATED)		Operation No. Revision 06/03/2005 PAGE 12

'Threads accepted to Class 2A limits before coating, (plating), are accepted after coating by basic size Class 3A GO thread gages.'

NOTE:

The above statement is from the standard 'American National Standard Unified Inch Screw Threads', document ANSI B1.1 page 16.

Certain coatings are gauged using the 2A thread gage even after the coating process has been completed. This is due to the nominal amount of the coating that is built up during the plating process. Those coatings are:

- 1). Chromate Treat: 9-3350
- 2). Passivation; stainless steel, unplated: 9-997

(the 9-xxxx refers to internal Amphenol specifications).

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	PLUG SHELL NON-SEALING SURFACE SURFACE FINISH		Revision 9/23/2013 PAGE 13

This Quality Standard is applicable to Plug shells unless otherwise specified by drawing or specification.

The area covered by this criteria is defined as: #1 the surface of the leading edge of the plug shell, which when in the mated condition, does not seat against the sealing gasket of the receptacle. The non-sealing surface is defined as continuing up to the location where sealing does occur with the receptacle o-ring or gasket. If the connector style does not have a sealing mechanism, such as an o-ring or gasket, then the non-sealing surface is defined as within .050 of the leading edge of the plug shell face. And #2 the front face and side of the plug shell shoulder for shell designs that do not seal on that surface.

Acceptable Imperfections:

1. Imperfections (nicks, scratches, dents) may exist on the surface of the Plug shell in the area defined above. Such imperfections to be acceptable must not affect the intended form, fit or function of the plug shell nor the form, fit or function of the mated connector assembly, as determined by Amphenol Quality.
2. Imperfections (nicks, scratches, dents) may extend across the entire surface of the Plug shell in the area defined above.
3. This workmanship standard will NOT be used to allow or accept cracks, cuts or tears in the material.

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	SETUP AND SCRAP PIECE HANDLING		

Setup and scrap pieces:

- Must be segregated from good parts.
- Must be placed into the red scrap bins at each workstation.
- The scrap bins must be emptied into the red scrap barrels at the end of each shift.
- Bad setup pieces should be well marked with red Dykem to indicate they need to be separate from good parts.
- Setup pieces are sometimes shared between processes within a department (first turn to second turn, for example), but they must be removed from the order before it leaves the department.