This document lays out the machine performance requirements for the Gi100DT which will be verified during Acceptance Testing. This document is the standard by with the Gi equipment will be judged.

This document will be used alongside the Acceptance Test Plan (ATP).

The full Acceptance Test Plan will be conducted using a single caliber projectile.

Dimensional Qualification

The proper method for verification of a measurement device is through the use of a *qualified machined gauge*. A gauge is measured by the Gi100DT 30 times, for *up to* 5 separate runs. A *minimum* of 1 of these runs must have ***all*** measurements 3σ be equal or less than the requirements in the table below.

Feature Name	3σ (mm)
Overall Length:	0.050
Step Lengths:	0.065
Shank Diameter:	0.010
Head Diameter:	0.015

False Reject Rate – Dimensional Defects

The Gi100DT false reject rate will be less than 1.0% of "good parts". Good parts are defined as those samples lying within the dimensional band highlighted in green in Figure 1 below and containing no critical, major, minor, permissible, or unclassified visual defects. These parts are obtained by running multiple "pre-screen" sorts, with tolerances tighter than print tolerances. False rejects are defined as samples lying within the green band that fail and have no critical, major, minor, permissible, or unclassified visual defects.

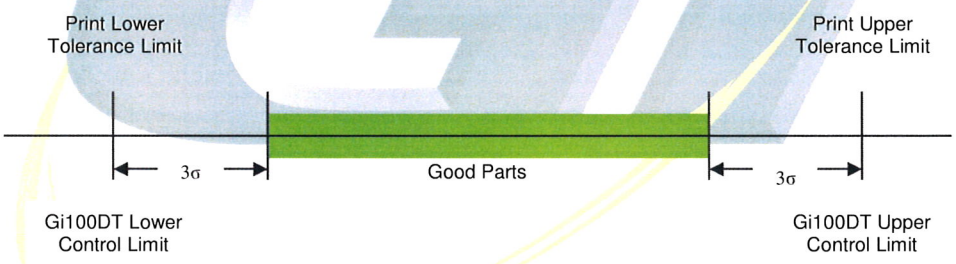
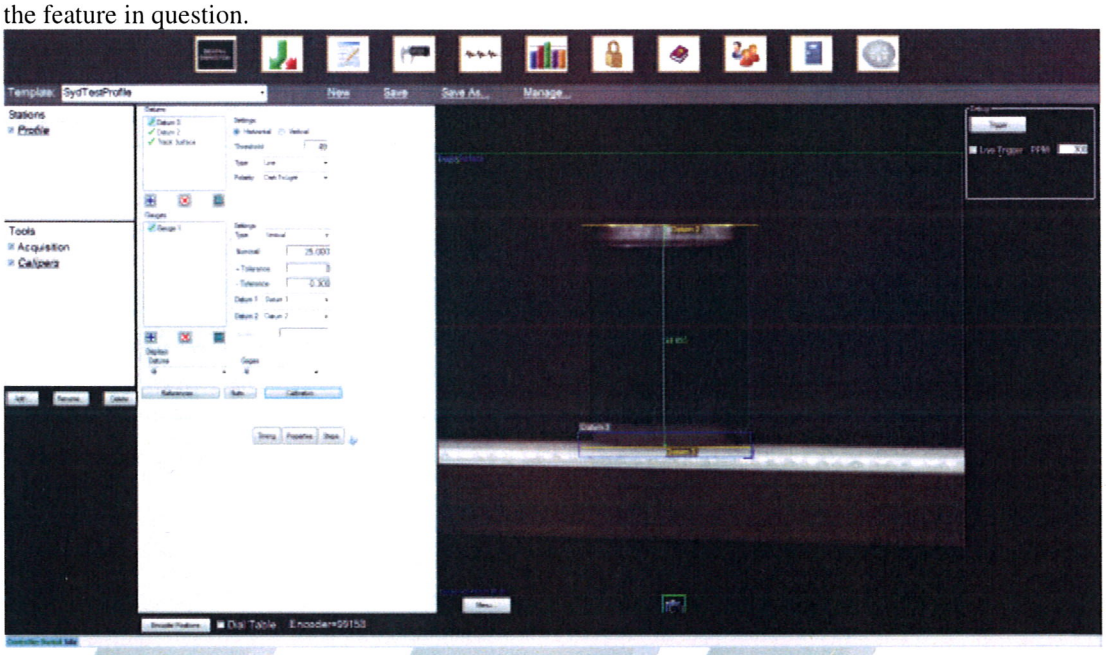


Figure 1: Dimensionally good parts are defined as those samples which lie within the highlighted green band.

Defect Detection[i]

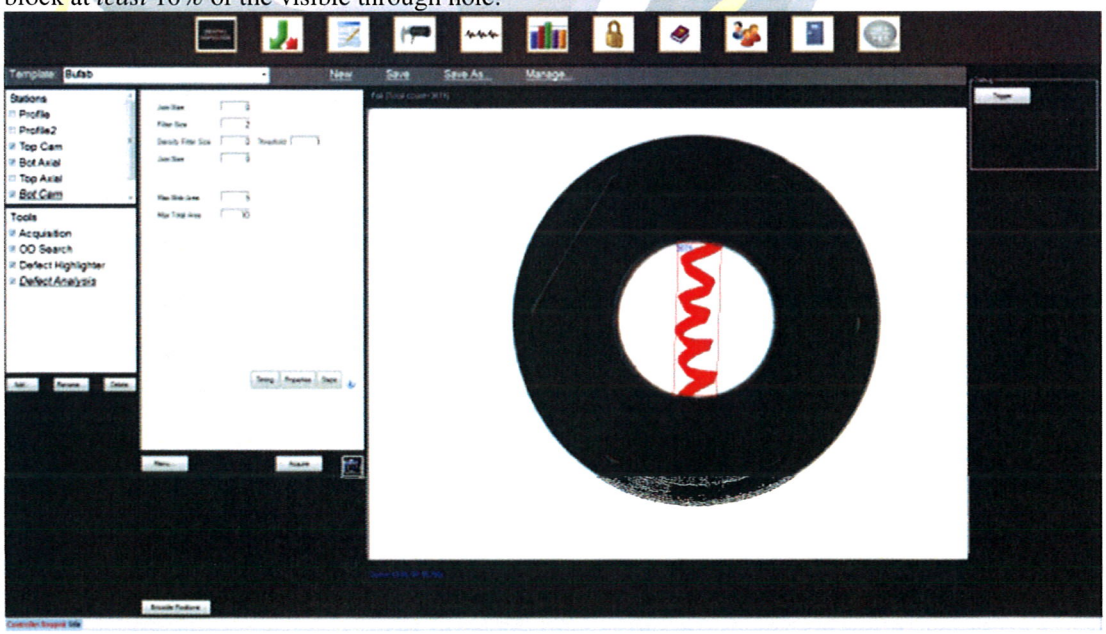
Dimensional Defects – 99%[ii]

Must show a dimensional deviation from the print tolerance by greater than the reported 3-sigma value for the feature in question.



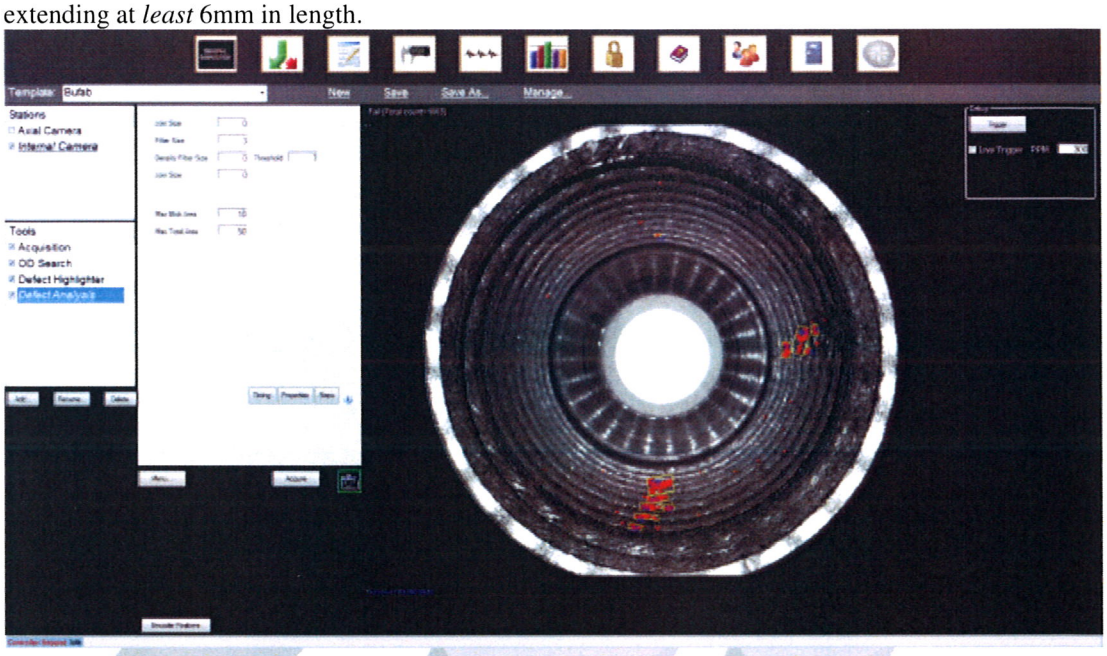
Burrs In Center Through Hole – 99%

Burr must not sit flush on inside wall of through hole, it must extend out at least 1mm from the wall and block at *least* 10% of the visible through hole.



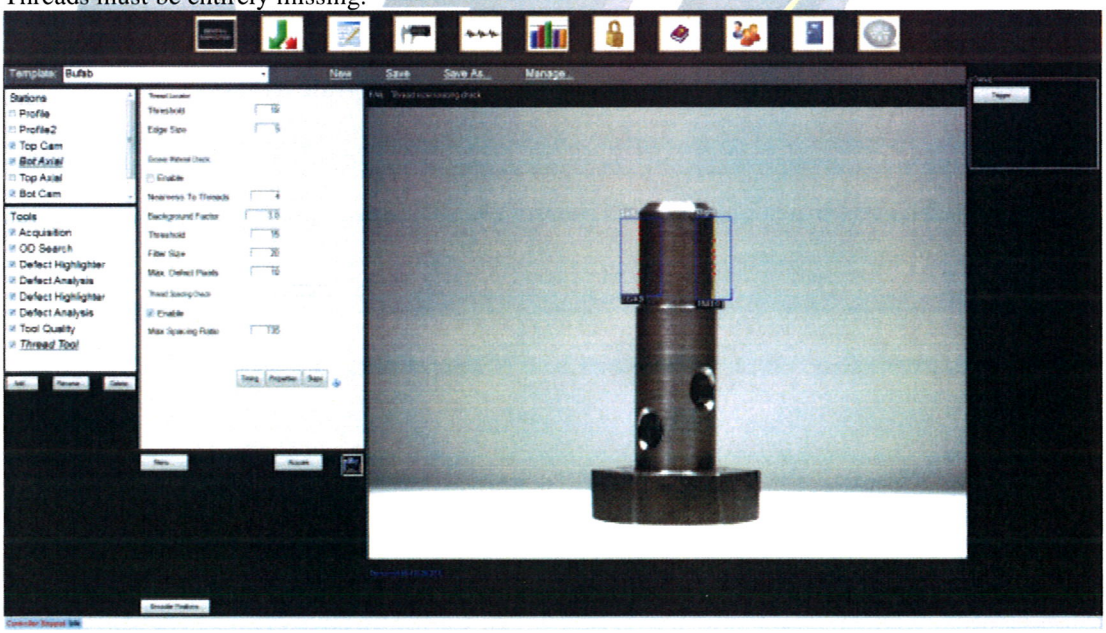
Thread Damage – 99%

Threads must show visible damage, extending at *least* around 20% of the circumference of the thread and extending at *least* 6mm in length.



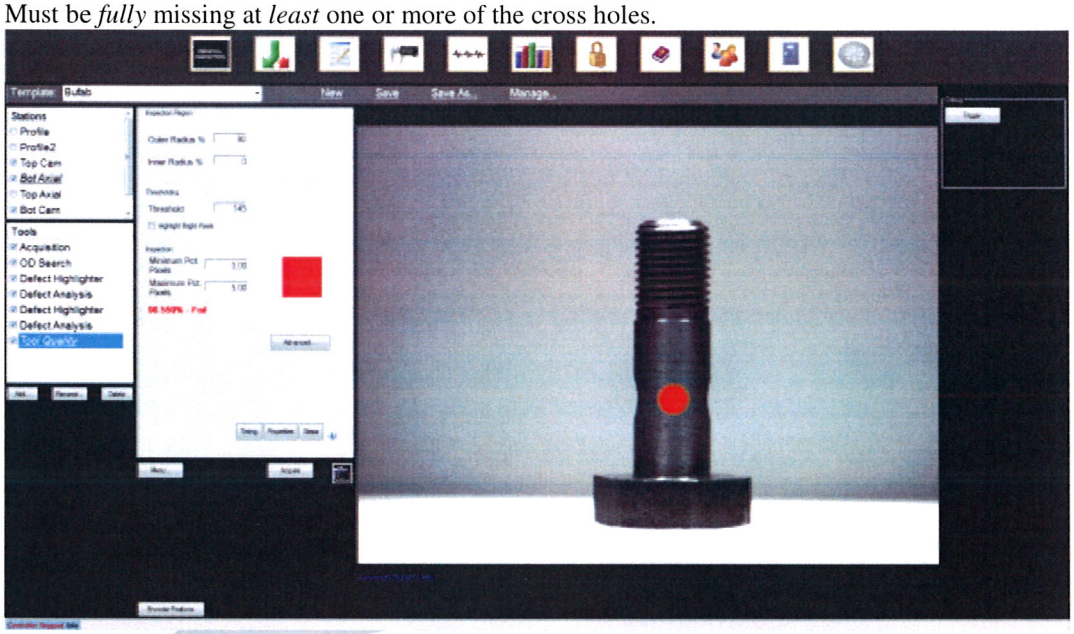
Thread Presence – 99%

Threads must be entirely missing.



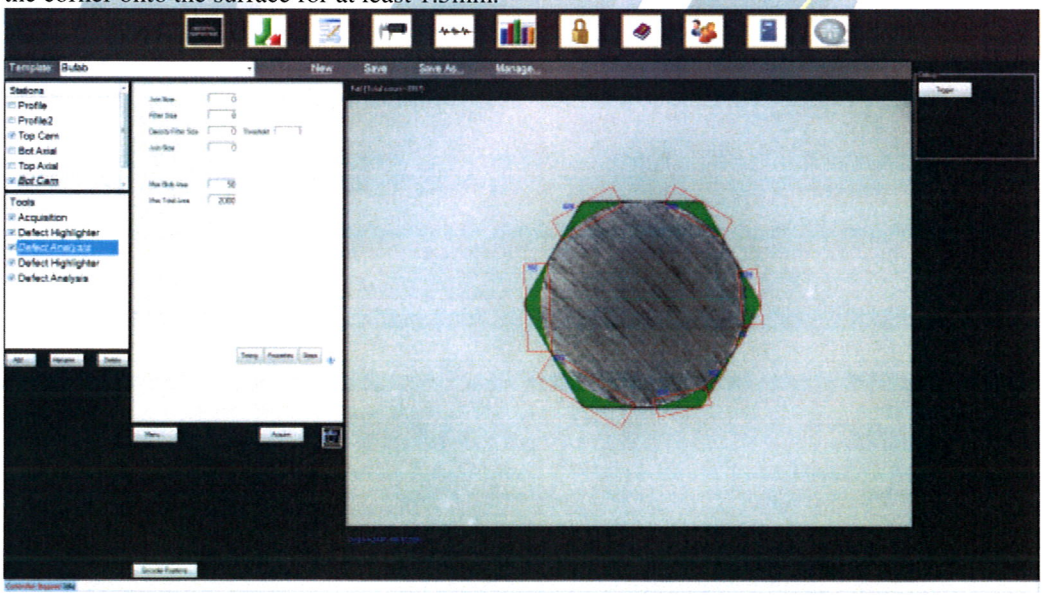
Missing Cross Hole – 99%

Must be *fully* missing at *least* one or more of the cross holes.



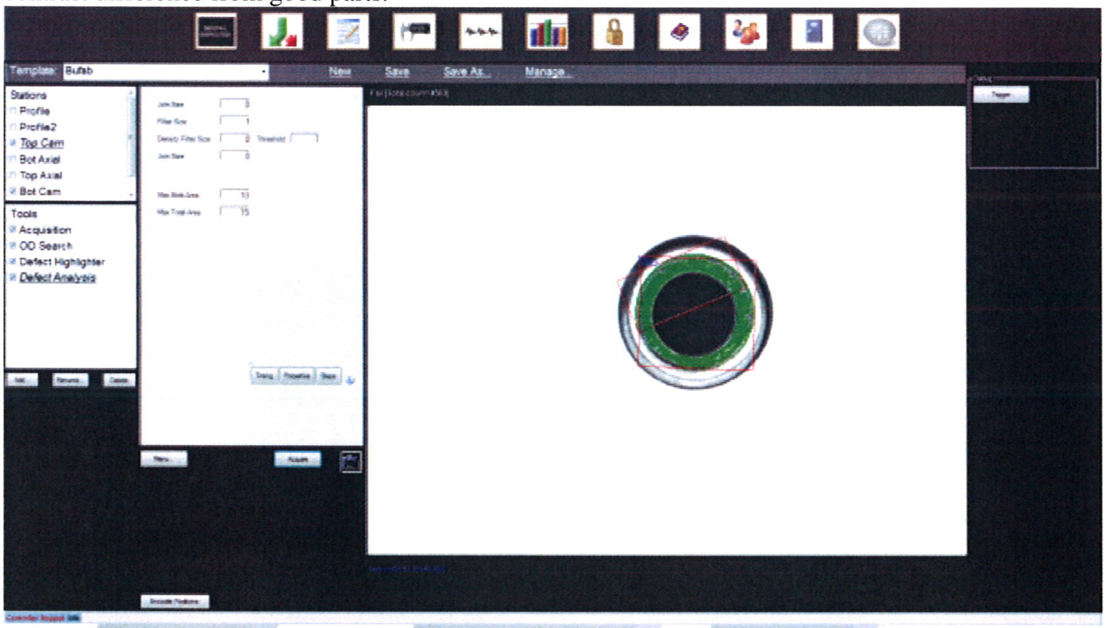
No Hex Chamfer – 99%

Must be *fully* missing all hex chamfer; good chamfers must show at least a visible chamfer extending from the corner onto the surface for at least 1.5mm.



Missing Machining – 99%

Surfaces missing a grind or machining process must either show a dimensional deviation from the print tolerance by greater than the reported 3-sigma value for the feature in question, or show a *noticeable*[iii] contrast difference from good parts.



Burrs In Center Hole (Non-Through Holes) – 99%

Burr must not sit flush on inside wall of through hole, it must extend out at least 1mm from the wall and block at *least* 25% of the visible through hole.

Machine Availability and Speed

The Gi100DT will achieve greater than 90% availability and will operate at an average rate greater than TBD[iv]. [v]

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[i] Stated defect sizes does not mean smaller defects will not be detected, only that they may not be detected with the % as stated

[ii] If any part becomes a subject of debate, it will be verified with the LaserLab, not hard or hand gauges

[iii] Defects showing this from Bufab have been easily detectable; if a sample becomes a subject of debate, the GI vision greyscale tool will be used to measure contrast difference

[iv] Rate to be updated in 4-8 weeks

[v] Parts must be clean and uniform in finish, with no tackiness or stickiness to them. They must be free of debris and scrap. If parts are not in this condition, this parameter is void and GI will work to set up the machine as best as can be to fit the parts. Parts must be *relatively* flat on top; if parts have height variations in the same part in excess of .25mm in the same part then rate and uptime will be effected.

2018-02-08

BUFAB LANN AB