Northern Maine Community College/HAAS Technical Education Center
33 Edgemont Drive
Presque Isle, Maine 04769

NMCC/HTEC Applied Practice

1.0 SUBJECT:
To establish acceptable practices for machined features that are not otherwise defined.

2.0 PURPOSE:
To establish guidelines for machined features that are not otherwise defined.

3.0 SCOPE:
Supplements print/specification tolerances when actual requirements are not specified by other appropriate documentation.

4.0 GENERAL:
Chain of tolerance unless specified by customer:

- 1st – Tolerance specified at the feature on the print
- 2nd – Tolerance specified in the notes on print
- 3rd – Tolerance specified in the tolerance block on print
- 4th – Tolerance specified in the customer's standards
- 5th – Tolerance specified in this document

DIMENSIONAL TOLERANCE THAT MAY APPLY TO THIS DOCUMENT:

Fractional ±.015
Two (2) place decimal ±.010
Angles ±.5°
Thread data – See "UNSPECIFIED THREAD REQUIREMENTS"
Drill data – See "DRILL HOLE REQUIREMENTS"
Socket screw data – See "SOCKET SCREW DATA"
When only the Ø is given for a "SPOTFACE":
Depth of spotface is machine to clean to .060 maximum depth. Additional depth tolerance must be approved by customer.

DIMENSIONAL TOLERANCE THAT SHALL NOT APPLY TO THIS DOCUMENT:
Customer contact is required in all of the following instances:
Three (3) place decimal .XXX
Four (4) place decimal .XXXX
Tolerances implied by virtue of their names:
reamed hole
sliding fit
running fit
press fit
dowel hole

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UNSPECIFIED THREAD REQUIREMENTS:

Chamfers:

O.D. threads – minor Ø to .020/.040 per side below minor Ø X 45° ± 5°
O.D. threads exiting into relief – relief Ø X 60° ± 5°
I.D. threads – major Ø plus .015/.040 above major Ø X 80°/135° included
Chamfer in clearance holes to tapped holes – drill point from clearance hole to tap drill is acceptable

I.D. Thread Depth:	Tap drill (full Ø) – given tap depth plus twelve (12) threads maximum Break-thru into other features is not allowed Specified depth to three (3) threads past (maximum)
O.D. Thread:	Specified length to three (3) threads past (maximum)
Class:	I.D. Threads – 2B O.D. Threads – 2A
Tolerance:	As shown in the Machinery's Handbook All tolerances apply on finished part after plating, heat treat, etc.

Gaging Straight Threads:

The first three (3) do not need to be in tolerance

DRILL HOLE REQUIREMENTS:

Drill hole diameters:	Up to .250 Ø +.005/-.002 Up to .251 to .500 Ø +.007/-.002 Up to .501 to 1.000 Ø +.010/-.002 Over 1.500 Ø +.015/-.002
Drill hole depths:	Measured at full diameter of drill Tap drill (see thread requirements) Reamed holes - .120 to .250 past reamed hole Break-thru into other features is not allowed
Drill hole chamfers:	Drill Ø +.010/.030 Drill point included angle from 85° to 140° Spot drill point included angle from 85° to 140°

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SOCKET SCREW DATA:

Drill hole diameters:	Screw diameters #0 up to 1/2 – "*Close Fit*" as defined in the Machinery's Handbook See "DRILL HOLE REQUIREMENTS" Screw diameters over 1/2 – "*Normal Fit*" as defined in the Machinery's Handbook See "DRILL HOLE REQUIREMENTS"
Counterbore size:	Screw diameters #0 up to 1/2 – Max. head Ø +.021/.031 Screw diameters over 1/2 – Max. head Ø +.037/.047
Counterbore depth:	Screw diameters #0 up to 1/2 – Max. head height (as defined in the Machinery's Handbook) +.015/.030 Screw diameters over 1/2 – Max. head height (as defined in the Machinery's Handbook) +.025/.050
Counterbore chamfers:	Counterbore Ø +.015/.030 Spot drill point included angle from 85° to 140°
Button head cap screws:	Countersink Ø "C" +.015/.030 X 60° ±.5° as specified in the Machinery's Handbook
Flat head cap screws:	Countersink Ø – "theoretical sharp" +.015/.030 X 82° ±2° as specified in the Machinery's Handbook

Document Revision Table		
Revision	**Revision Description**	**Approved - Date**
1	Released for facility use	D. Duplessis – 10/1/2008
2	Corrected Counterbore Size .021/.031 was .016/.026 : .037/.047 was .032/.042	D. Duplessis – 10/2/2008