

# Supplier Quick Reference

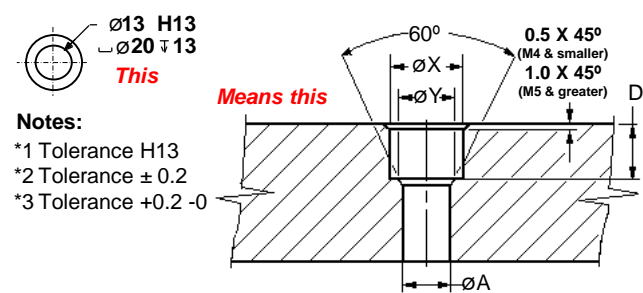
## Common Drawing Features and Manufacturing Practices

All dimensions in millimeters unless otherwise specified

### 1) Scope and Purpose

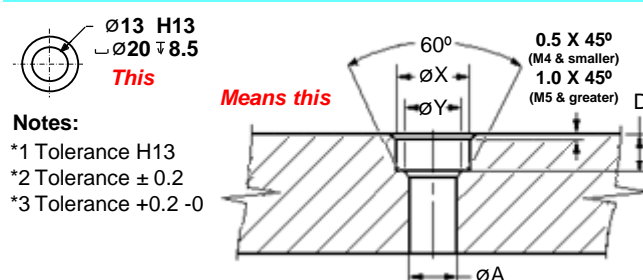
This document is a quick reference for Husky Suppliers. It is designed to complement drawings that do not fully describe specific component features. This document is not intended to replace or supersede drawing specifications: Full detail of these features is obtained by combining the drawing with the quick reference information. The quick reference is applicable on drawings where designated as follows: UNDEFINED DRAWING FEATURES TO COMPLY WITH HS534 "SUPPLIER QUICK REFERENCE"

### 2) Metric Counterbore Holes



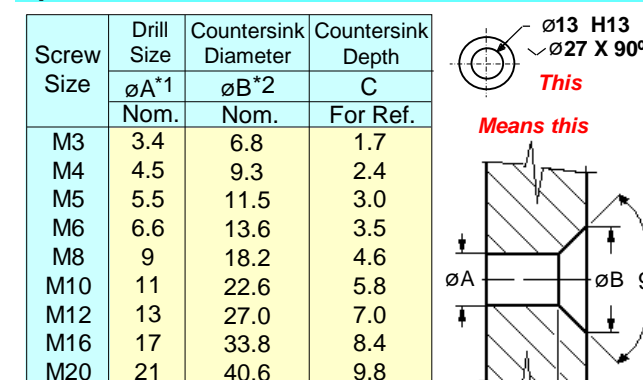
| Screw Size | Drill Size       | Counterbore Diameter | Countersink Diameter | Counterbore Depth |
|------------|------------------|----------------------|----------------------|-------------------|
|            | øA <sup>*1</sup> | øX <sup>*2</sup>     | øY <sup>*3</sup>     | D <sup>*2</sup>   |
|            | Nom.             | Nom.                 | Min.                 | Nom.              |
| M1.6       | 1.8              | 3.5                  | 2.0                  | 1.8               |
| M2         | 2.4              | 4.2                  | 2.6                  | 2.2               |
| M2.5       | 2.9              | 5.0                  | 3.1                  | 2.7               |
| M3         | 3.4              | 6.0                  | 3.6                  | 3.4               |
| M4         | 4.5              | 8.0                  | 4.7                  | 4.6               |
| M5         | 5.5              | 10.0                 | 5.7                  | 5.7               |
| M6         | 6.6              | 11.0                 | 6.8                  | 6.8               |
| M8         | 9.0              | 15.0                 | 9.2                  | 9.0               |
| M10        | 11.0             | 18.0                 | 11.2                 | 11.0              |
| M12        | 13.0             | 20.0                 | 14.2                 | 13.0              |
| M16        | 17.0             | 26.0                 | 18.2                 | 17.5              |
| M20        | 21.0             | 33.0                 | 22.4                 | 21.5              |
| M24        | 25.0             | 38.0                 | 26.4                 | 25.5              |
| M30        | 31.0             | 48.0                 | 33.4                 | 31.5              |
| M36        | 37.0             | 57.0                 | 39.4                 | 37.5              |
| M42        | 43.0             | 66.0                 | 45.6                 | 43.5              |
| M48        | 49.0             | 75.0                 | 52.6                 | 50.0              |

### 3) Counterbore Holes for Metric LHCS



| Screw Size | Drill Size       | Counterbore Diameter | Countersink Diameter | Counterbore Depth |
|------------|------------------|----------------------|----------------------|-------------------|
|            | øA <sup>*1</sup> | øX <sup>*2</sup>     | øY <sup>*3</sup>     | D <sup>*2</sup>   |
|            | Nom.             | Nom.                 | Min.                 | Nom.              |
| M3         | 3.4              | 6.0                  | 3.6                  | 2.4               |
| M4         | 4.5              | 8.0                  | 4.7                  | 3.2               |
| M5         | 5.5              | 10.0                 | 5.7                  | 4.0               |
| M6         | 6.6              | 11.0                 | 6.8                  | 4.7               |
| M8         | 9.0              | 15.0                 | 9.2                  | 6.0               |
| M10        | 11.0             | 18.0                 | 11.2                 | 7.0               |
| M12        | 13.0             | 20.0                 | 14.2                 | 8.5               |
| M16        | 17.0             | 26.0                 | 18.2                 | 10.5              |
| M20        | 21.0             | 33.0                 | 22.4                 | 13.0              |

### 4) Metric Countersink Holes



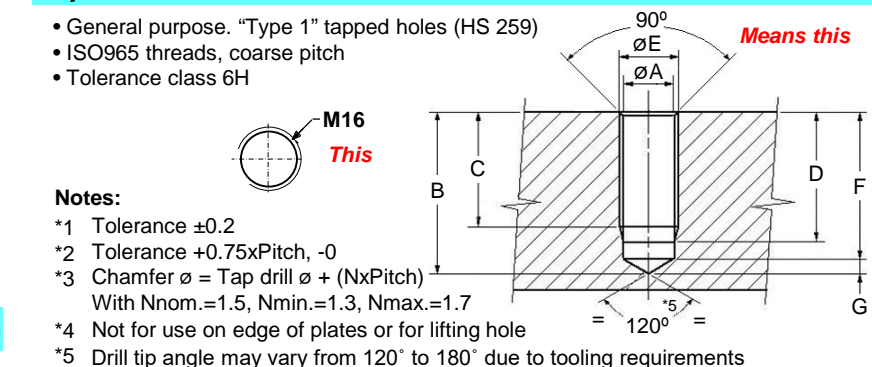
| Screw Size | Drill Size       | Countersink Diameter | Countersink Depth |
|------------|------------------|----------------------|-------------------|
|            | øA <sup>*1</sup> | øB <sup>*2</sup>     | C                 |
|            | Nom.             | Nom.                 | For Ref.          |
| M3         | 3.4              | 6.8                  | 1.7               |
| M4         | 4.5              | 9.3                  | 2.4               |
| M5         | 5.5              | 11.5                 | 3.0               |
| M6         | 6.6              | 13.6                 | 3.5               |
| M8         | 9                | 18.2                 | 4.6               |
| M10        | 11               | 22.6                 | 5.8               |
| M12        | 13               | 27.0                 | 7.0               |
| M16        | 17               | 33.8                 | 8.4               |
| M20        | 21               | 40.6                 | 9.8               |

Notes:  
\*1 Tolerance H13  
\*2 Tolerance ± 0.2  
\*3 Tolerance +0.2 -0

### 5) Metric Clearance Holes

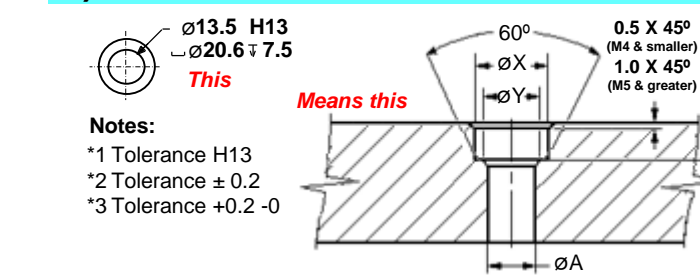
| Screw Size | Drill Size       | Countersink Diameter |
|------------|------------------|----------------------|
|            | øA <sup>*1</sup> | øY <sup>*2</sup>     |
|            | Nom.             | Nom.                 |
| M1.6       | 1.8              | 2.0                  |
| M2         | 2.4              | 2.6                  |
| M2.5       | 2.9              | 3.1                  |
| M3         | 3.4              | 3.6                  |
| M4         | 4.5              | 4.7                  |
| M5         | 5.5              | 5.7                  |
| M6         | 6.6              | 6.8                  |
| M8         | 9.0              | 9.2                  |
| M10        | 11.0             | 11.2                 |
| M12        | 13.0             | 14.2                 |
| M16        | 17.0             | 18.2                 |
| M20        | 21.0             | 22.4                 |
| M24        | 25.0             | 26.4                 |
| M30        | 31.0             | 33.4                 |
| M36        | 37.0             | 39.4                 |
| M42        | 43.0             | 45.6                 |
| M48        | 49.0             | 52.6                 |

### 6) Metric Thread Installations



| Thread           | Pitch | Tap Drill |                | Tapping        |                | Chamfer         |       | For Ref. |       |         |        |
|------------------|-------|-----------|----------------|----------------|----------------|-----------------|-------|----------|-------|---------|--------|
|                  |       | øA        | B <sup>1</sup> | C <sup>2</sup> | D <sup>2</sup> | øE <sup>3</sup> | F     | G        | Nom.  | Nom.    |        |
| M3               | 0.5   | 2.5       | 2.599          | 2.459          | 9.5            | 6               | 7.5   | 3.25     | ±0.1  | 8.778   | 0.722  |
| M4               | 0.7   | 3.3       | 3.422          | 3.242          | 12.5           | 8               | 10.1  | 4.35     | ±0.14 | 11.547  | 0.953  |
| M5               | 0.8   | 4.2       | 4.334          | 4.134          | 16             | 10              | 12.4  | 5.4      | ±0.16 | 14.788  | 1.212  |
| M6               | 1     | 5         | 5.153          | 4.917          | 18.5           | 12              | 15    | 6.5      | ±0.2  | 17.057  | 1.443  |
| M8               | 1.25  | 6.75      | 6.912          | 6.647          | 24             | 16              | 19.75 | 8.625    | ±0.25 | 22.051  | 1.949  |
| M10              | 1.5   | 8.5       | 8.676          | 8.376          | 30             | 20              | 24.5  | 10.75    | ±0.3  | 27.546  | 2.454  |
| M12              | 1.75  | 10.25     | 10.441         | 10.106         | 35             | 24              | 29.25 | 12.875   | ±0.35 | 32.041  | 2.959  |
| M16              | 2     | 14        | 14.21          | 13.835         | 45             | 32              | 38    | 17.0     | ±0.4  | 40.959  | 4.041  |
| M20 <sup>4</sup> | 2.5   | 17.5      | 17.744         | 17.294         | 56             | 40              | 47.5  | 21.25    | ±0.5  | 50.948  | 5.052  |
| M24              | 3     | 21        | 21.252         | 20.752         | 67             | 48              | 57    | 25.5     | ±0.6  | 60.938  | 6.062  |
| M30              | 3.5   | 26.5      | 26.771         | 26.211         | 83             | 60              | 70.5  | 31.75    | ±0.7  | 75.35   | 7.65   |
| M36              | 4     | 32        | 32.27          | 31.67          | 98             | 72              | 84    | 38.0     | ±0.8  | 88.762  | 9.238  |
| M42              | 4.5   | 37.5      | 37.799         | 37.129         | 114            | 84              | 97.5  | 44.25    | ±0.9  | 103.175 | 10.825 |
| M48              | 5     | 43        | 43.297         | 42.587         | 130            | 96              | 111   | 50.5     | ±1.0  | 117.587 | 12.413 |
| M56              | 5.5   | 50.5      | 50.796         | 50.046         | 150            | 112             | 128.5 | 58.75    | ±1.1  | 135.422 | 14.578 |

### 7) Counterbore Holes for Inch LHCS



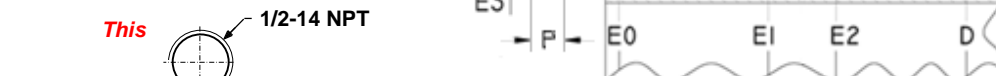
| Screw Size | Drill Size       | Counterbore Diameter | Countersink Diameter | Counterbore Depth |
|------------|------------------|----------------------|----------------------|-------------------|
|            | øA <sup>*1</sup> | øX <sup>*2</sup>     | øY <sup>*3</sup>     | D <sup>*2</sup>   |
|            | Inch             | Inch                 | Min.                 | Nom.              |
| #4         | 0.1120           | 3.5                  | 5.5                  | 2.0               |
| #8         | 0.1640           | 4.9                  | 8.0                  | 2.5               |
| #10        | 0.1900           | 5.6                  | 9.5                  | 3.0               |
| 1/4        | 0.2500           | 7.1                  | 11.1                 | 4.0               |
| 5/16       | 0.3125           | 8.7                  | 13.5                 | 5.0               |
| 3/8        | 0.0375           | 10.3                 | 15.9                 | 6.0               |
| 1/2        | 0.5000           | 13.5                 | 20.6                 | 7.5               |

All dimensions in millimeters unless otherwise specified

Notes:  
\*1 Tolerance H13  
\*2 Tolerance ± 0.2  
\*3 Tolerance +0.2 -0

### 8) NPT / NPTF Pipe Threads

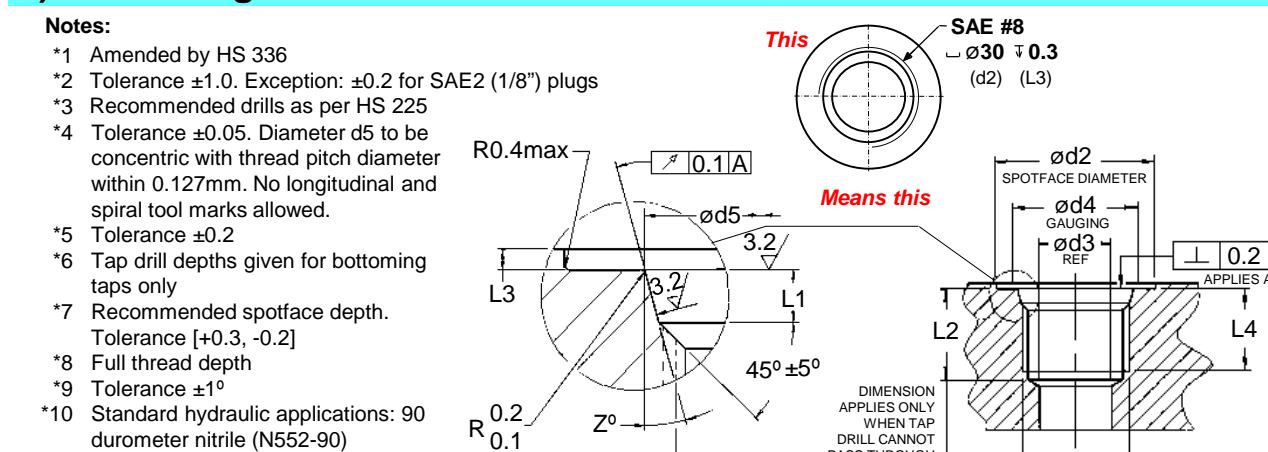
- NPT - National Pipe Thread Taper
- NPTF - Dryseal American National Standard Taper Pipe Thread
- Sealant required on NPT
- 60° Thread Angle
- Pitch measured in inches
- Truncation of root and crest are flat
- Taper angle 1° 47' (taper 1:16)



| NPT Thread (Inch) | Threads Per Inch | Outside Pipe Diameter øD | Pitch of Thread P | Height of Thread h | Truncation Max.*1 f | Pitch Diameter Start of Ext. Thread øE0 | Handtight Engagement |              | Effective Thread |              | Wrench Makeup Length, Internal |              | Vanish Thread Length V | Tapping Drills *3 |          |
|-------------------|------------------|--------------------------|-------------------|--------------------|---------------------|---|----------------------|--------------|------------------|--------------|--------------------------------|--------------|------------------------|-------------------|----------|
|                   |                  |                          |                   |                    |                     |   | Length L1            | Diameter øE1 | Length L2        | Diameter øE2 | Length L3                      | Diameter øE3 |                        | Drill Size (Inch) | Eq. (mm) |
| 1/16"             | 27               | 7.9375                   | 0.940816          | 0.752602           | 0.09144             | 6.887972                                | 4.064                | 7.141972     | 6.63194          | 7.3025       | 2.82194                        | 6.711696     | 3.2639                 | C                 | 6.1468   |
| 1/8"              | 27               | 10.287                   | 0.940816          | 0.752602           | 0.09144             | 9.233154                                | 4.1148               | 9.48944      | 6.70306          | 9.652        | 2.82194                        | 9.056624     | 3.2639                 | Q                 | 8.4328   |
| 1/4"              | 18               | 13.716                   | 1.411224          | 1.128776           | 0.12446             | 12.125706                               | 5.7912               | 12.487402    | 10.20572         | 12.7635      | 4.23418                        | 11.861038    | 4.89712                | 7/16"             | 11.1125  |
| 3/8"              | 18               | 17.145                   | 1.411224          | 1.128776           | 0.12446             | 15.545054                               | 6.096                | 15.926054    | 10.35812         | 16.1925      | 4.23418                        | 15.28064     | 4.89712                | 37/64"            | 14.68374 |
| 1/2"              | 14               | 21.336                   | 1.814322          | 1.451356           | 0.14224             | 19.264122                               | 8.128                | 19.772122    | 13.55598         | 20.111466    | 5.44322                        | 18.924016    | 6.29412                | 45/64"            | 17.85874 |
| 3/4"              | 14               | 26.67                    | 1.814322          | 1.451356           | 0.14224             | 24.579072                               | 8.6106               | 25.117298    | 13.86078         | 25.445466    | 5.44322                        | 24.238966    | 6.29412                | 29/32"            | 23.02002 |
| 1"                | 11 1/2           | 33.401                   | 2.208784          | 1.767078           | 0.16002             | 30.826202                               | 10.16                | 31.461202    | 17.34312         | 31.91002     | 6.26286                        | 30.412182    | 7.66318                | 1-9/32"           | 32.54502 |
| 1 1/4"            | 11 1/2           | 42.164                   | 2.208784          | 1.767078           | 0.16002             | 39.551102                               | 10.668               | 40.217852    | 17.95272         | 40.67302     | 6.26286                        | 39.137082    | 7.66318                | 1-15/32"          | 37.30752 |
| 1 1/2"            | 11 1/2           | 48.26                    | 2.208784          | 1.767078           | 0.16002             | 45.620686                               | 10.2108              | 46.287436    | 18.3769          | 46.76902     | 6.26286                        | 45.206412    | 7.66318                | 1-23/32"          | 43.65752 |
| 2"                | 11 1/2           | 60.325                   | 2.208784          | 1.767078           | 0.16002             | 57.633108                               | 11.0744              | 58.325258    | 19.2151          | 58.83402     | 6.26286                        | 57.219088    | 7.66318                | 2-5/32"           | 54.77002 |
| 2 1/2"            | 8                | 73.025                   | 3.175             | 2.54               | 0.19812             | 69.076062                               | 17.3228              | 70.15861     | 28.8925          | 70.881748    | 6.35                           | 68.679314    | 11.01598               | 2-25/32"          | 70.64502 |
| 3"                | 8                | 88.9                     | 3.175             | 2.54               | 0.19812             | 84.851748                               | 19.4564              | 86.0679      | 30.48            | 86.756748    | 6.35                           | 84.5515      | 11.01598               | 3-9/32"           | 83.34502 |

All dimensions in millimeters unless otherwise specified

### 9) SAE Straight Thread Ports



| d1     | Thread |                 | Tap Drill Dia (mm) |       | Fittings & Plugs Only (Standard) |      | Plugs Only (Optional) |      | ød3 <sup>*3</sup> |      | ød4 <sup>*4</sup> |      | ød5 <sup>*4</sup> |      | L1 <sup>*5</sup> |       | L2 <sup>*6</sup> |      | Fittings |      | Plugs |      | L4 <sup>*8</sup> |      | Z <sup>*9</sup> |      | O-Ring Size <sup>*10</sup> |      |
|--------|--------|-----------------|--------------------|-------|----------------------------------|------|-----------------------|------|-------------------|------|-------------------|------|-------------------|------|------------------|-------|------------------|------|----------|------|-------|------|------------------|------|-----------------|------|----------------------------|------|
|        | Nom.   | SAE #           | Min.               | Max.  | Nom.                             | Max. | Nom.                  | Max. | Nom.              | Max. | Nom.              | Max. | Nom.              | Max. | Nom.             | Max.  | Nom.             | Max. | Nom.     | Max. | Nom.  | Max. | Nom.             | Max. | Nom.            | Max. | Nom.                       | Max. |
| 1/8"   | -2     | 5/16-24 UNF-2B  | 6.78               | 7.04  | 17                               | 12   | 6.35                  | 11   | 9.15              | 2.1  | 12                | 0.3  | 3.5               | 10   | 12"              | 3-902 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 1/4"   | -4     | 7/16-20 UNF-2B  | 9.73               | 10.03 | 21                               | 16   | 8.7                   | 15   | 12.45             | 2.6  | 14                | 0.3  | 3.5               | 11.5 | 12"              | 3-904 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 3/8"   | -6     | 9/16-18 UNF-2B  | 12.75              | 13.08 | 25                               | 21   | 11.2                  | 18   | 15.7              | 2.7  | 15.5              | 0.3  | 3.5               | 12.7 | 12"              | 3-906 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 1/2"   | -8     | 3/4-16 UNF-2B   | 17.32              | 17.68 | 30                               | 24   | 16                    | 22   | 20.65             | 2.7  | 17.5              | 0.3  | 5                 | 14.3 | 15"              | 3-908 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 5/8"   | -10    | 7/8-14 UNF-2B   | 20.27              | 20.68 | 34                               | 28   | 20                    | 26   | 24.0              | 2.7  | 20                | 0.3  | 5                 | 16.7 | 15"              | 3-910 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 3/4"   | -12    | 1 1/16-12 UN-2B | 24.69              | 25.15 | 41                               | 34   | 20                    | 32   | 29.2              | 3.5  | 23                | 0.3  | 5                 | 19   | 15"              | 3-912 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 7/8"   | -14    | 1 3/16-12 UN-2B | 27.86              | 28.32 | 45                               | 38   | 25                    | 35   | 32.4              | 3.5  | 23                | 0.3  | 5                 | 19   | 15"              | 3-914 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 1"     | -16    | 1 5/16-12 UN-2B | 31.04              | 31.50 | 49                               | 42   | 30                    | 38   | 35.55             | 3.5  | 23                | 0.3  | 5                 | 19   | 15"              | 3-916 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 1 1/4" | -20    | 1 5/8-12 UN-2B  | 38.99              | 39.45 | 58                               | 50   | 38                    | 48   | 43.55             | 3.5  | 23                | 0.3  | 5                 | 19   | 15"              | 3-920 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 1 1/2" | -24    | 1 7/8-12 UN-2B  | 45.34              | 45.80 | 65                               | 58   | 45                    | 54   | 49.9              | 3.5  | 23                | 0.3  | 5                 | 19   | 15"              | 3-924 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |
| 2"     | -32    | 2 1/2-12 UN-2B  | 61.21              | 61.67 | 88                               | 75   | 50                    | 70   | 65.75             | 3.5  | 23                | 0.3  | 5                 | 19   | 15"              | 3-932 |                  |      |          |      |       |      |                  |      |                 |      |                            |      |

All dimensions in millimeters unless otherwise specified

### 10) Four-Bolt Split Flange Ports

