Drafting – Common Mistakes

Links: Poor Draft
       Better Draft
Drafting – Common Mistakes

SECTION A-A
SCALE 2 : 1

DETAIL B
SCALE 4 : 1

Ohio University - Dr. Cyders
Non-descriptive title

Not Noted (BUT SHOULD BE):
• Drawing Scale
• Part Material/Condition
• Angle Projection
• Dimension Units
• General Tolerances
Title Block - Better

- Extra space left for drawing
- Default tolerances noted
- Angle projection detailed
- Dimension units noted
- Descriptive title

<table>
<thead>
<tr>
<th>Default Tolerance Values</th>
<th>Mat'l</th>
</tr>
</thead>
<tbody>
<tr>
<td>X.X... ±0.1</td>
<td>304 Stainless Steel</td>
</tr>
<tr>
<td>X.XX... ±0.01</td>
<td></td>
</tr>
<tr>
<td>X.XXX... ±0.005</td>
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</tr>
<tr>
<td>X.X... ±1°</td>
<td></td>
</tr>
<tr>
<td>X.XX... ±0.5°</td>
<td></td>
</tr>
<tr>
<td>X.XXX... ±0.05°</td>
<td></td>
</tr>
</tbody>
</table>

Third Angle ASME Y14.5 2009

O-Ring Seal Disc

Drayer T. Cyders

Designer T. Cyders

Engineer

3/14/2013 Ohio University - Dr. Cyders
Counterbores/countersinks/tapered holes should be dimensioned in their visible face (the face you’ll be drilling from)

Nonsensical view alignment

Circular features are located/dimensioned by their centers

Which is which? Holy dimension crowding, Batman!

Crossing dimension leaders (avoidable), counterbore should be dimensioned to outer diameter
Dimensioning – Poor (cont’d)

Ambiguity (which dimension is .05?) and repeated dimension (1.65+2*0.05 = 1.75)

Crossing dimension leaders (avoidable), repeated dimension from other view

Unclear what dimension is to, dimensioning to hidden line

Hidden lines do poor job of clarifying part structure
Other Notes:
• Scale is unnecessarily small (lots of unused space, while details in the model are obviously too compact)
• Additional views are necessary
• No centerlines included
• No tolerances included (EVERY dimension must have a tolerance!)
• Sheet size is too small to accommodate necessary views
• Most machinists would outright reject this drawing (and rightly so)
Dimensioning – Better
Dimensioning – Better (cont’d)

- Counterbore dimensioned to OD and toleranced
- Circular features/patterns have centerlines and centermarks
- Dimensions limited to those which can be clearly identified in this view
Dimensioning – Better (cont’d)

- Counterbore dimensioned in correct face
- Circular features/patterns dimensioned and located by their centerlines/centermarks
- Dimensions limited to those which can be clearly identified in this view
Dimensioning – Better (cont’d)

When necessary, diameters can be dimensioned in the transverse view (but must include the diameter symbol!)

Detail view used to give space/scale for close, fine dimensions

Section view used to clarify complicated structure

Centerlines included, even in section views
Dimensioning – Better (cont’d)

Other Notes:

- Select an appropriate sheet size to provide space instead of trying to shove a drawing into a sheet size for ease of printing
- Do not be afraid to add views when necessary
- Be sure not to overconstrain the drawing
- Apply dimensions in the way that they matter!
- Think about how the part will probably be made and held
- Be clear
Conclusions

• Producing a quality draft is vital to the correct production of a functional part
• Dimensions and tolerances require thought
• Clear, concise drawings avoid questions, and make for happy fabricators who like to work with you
• Producing high-quality drawings to accompany your designs makes you incredibly valuable, while producing drawings that require someone to constantly go over them makes you a liability
• You are ultimately responsible for what your drawing says, regardless of your intent