Clock Base GD&T Document
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The original clock base drawing relied on size dimensions to define geometry. This update is to apply GD&T (geometric dimensioning and tolerancing) to more accurately define the part, and its critical features.

Requirements

The clock base must satisfy these functional requirements:

- Provide a flat and stable base so the slock sits level.
- Accurately locate and support the acrylic clock face at an angle
- Hold the pen and pencil holders vertically.
- Maintain consistent geometry to allow proper assembly without any interference.
- Should have a consistent smooth surface finish.

Datum Selection

Primary Datum:

The bottom face was selected as the primary datum because it establishes the vertical reference for the part. All the hole depths, features and the thickness is defined based on this surface.

Secondary Datum:

The rear vertical face is the secondary datum, this sets the x direction of features on the clock, and is used to locate and drill the pen/pencil holders.

Third Datum:

The Axis of the pen holder holes are used to locate the part for machining the clock face slot and controls the relationship between the pen holders and the slot.

Application of Feature control frames

Form controls:

Flatness was applied to the bottom face to ensure the base does not rock and that the flush mounted screw has proper fitment. Cylidricity was applied to the pen holder hole to make sure that the threads fit and align properly.

Orientation Controls:

Perpendicularity is used for the vertical face and the axes of the holder holes, relative to datum for vertical alignment. Parallelism is applied to the top and bottom surfaces for constant thickness. Angularity is applied to the slot to control the angle of the acrylic clock face.

Location Controls:

True position is applied to the pen holder to locate them relative to the datum reference frame. Profile of a surface was also applied to the slot to control its geometry and make sure the clock face seats properly.

Surface Finish Requirements

All visible and functional machined surfaces of the part must be sanded to a minimum of 600 grit and should have no burs. The bottom surface is exempt from the 600 grit requirement but still must not have any burs.