

Repeat - 0 - Meter

20 μ in



Flexture

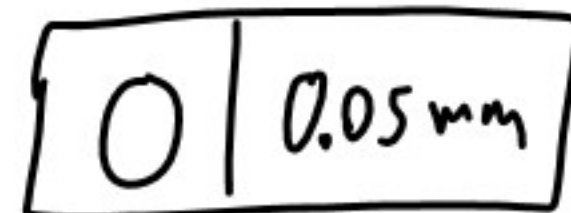
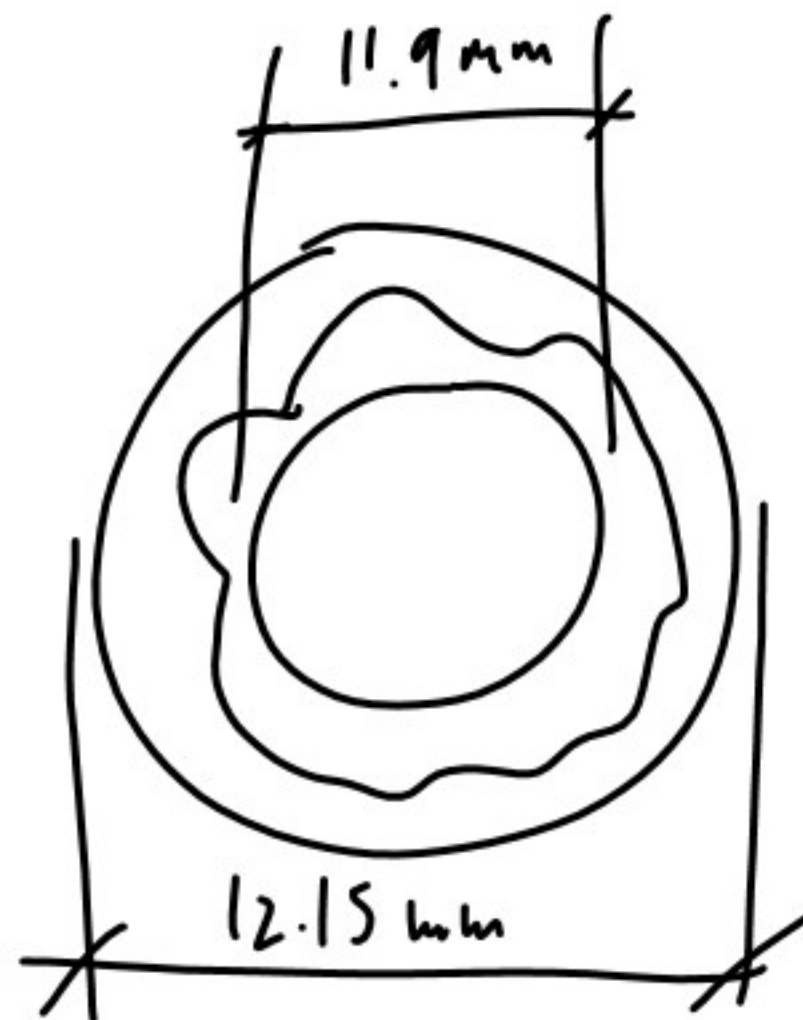
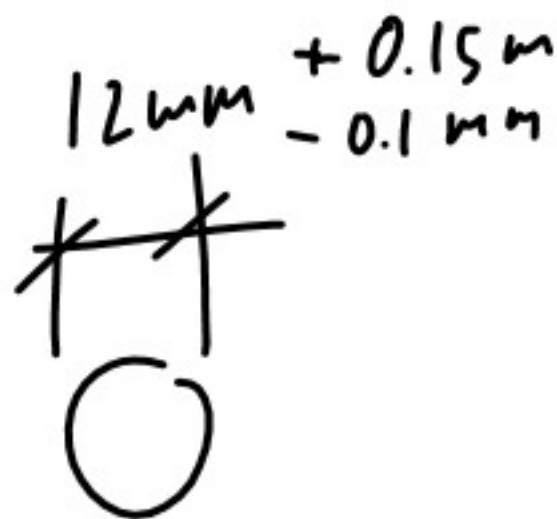
W

W

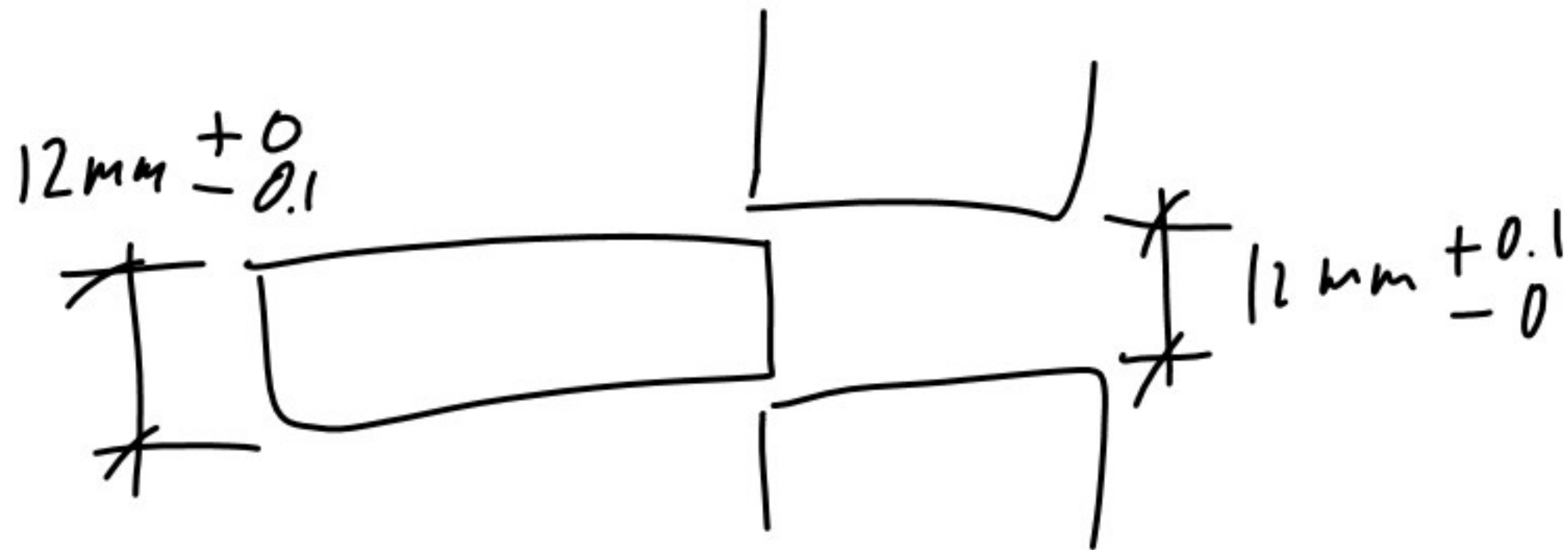
G D & T

Geometric Dimensioning and Tolerancing

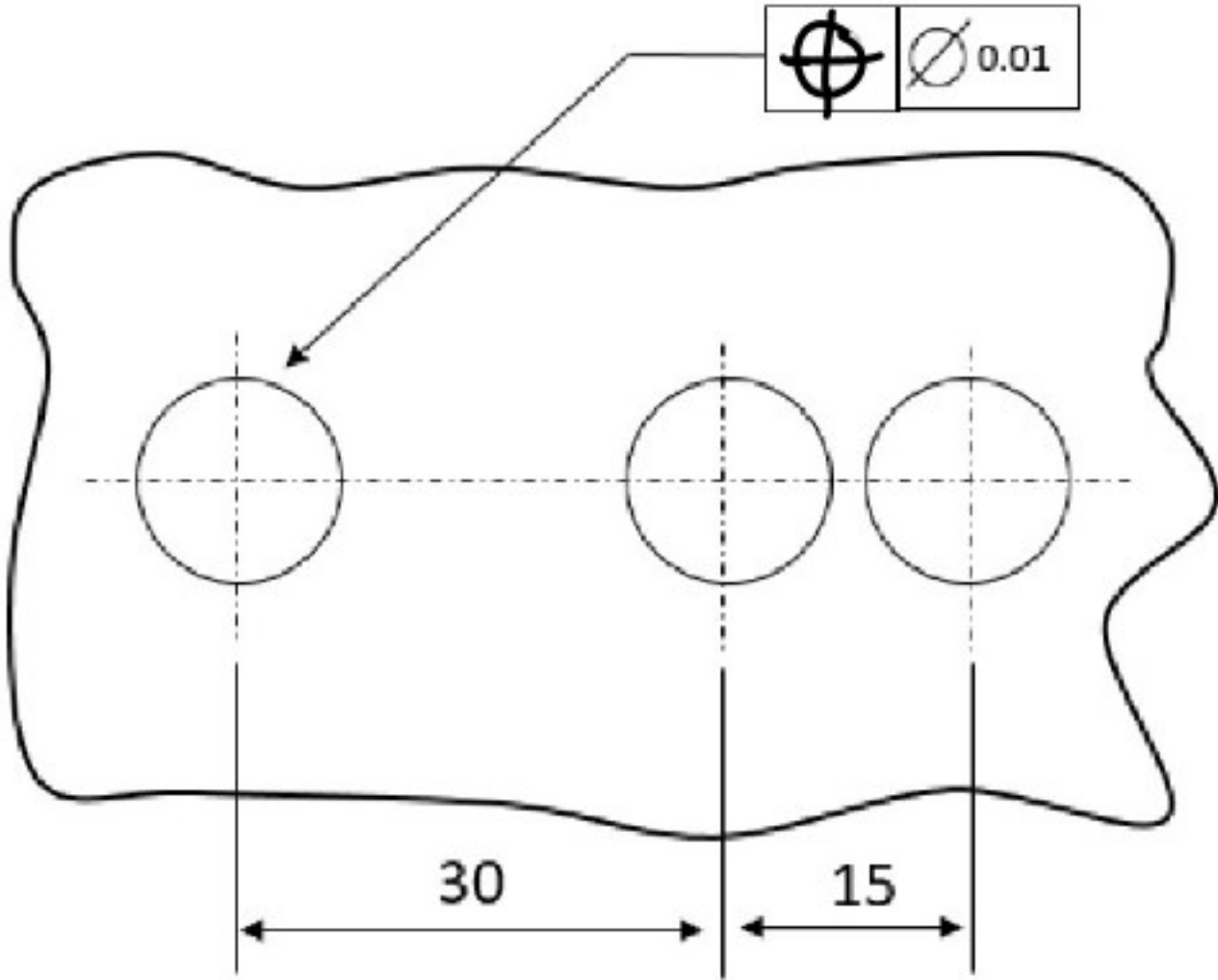
Tolerances



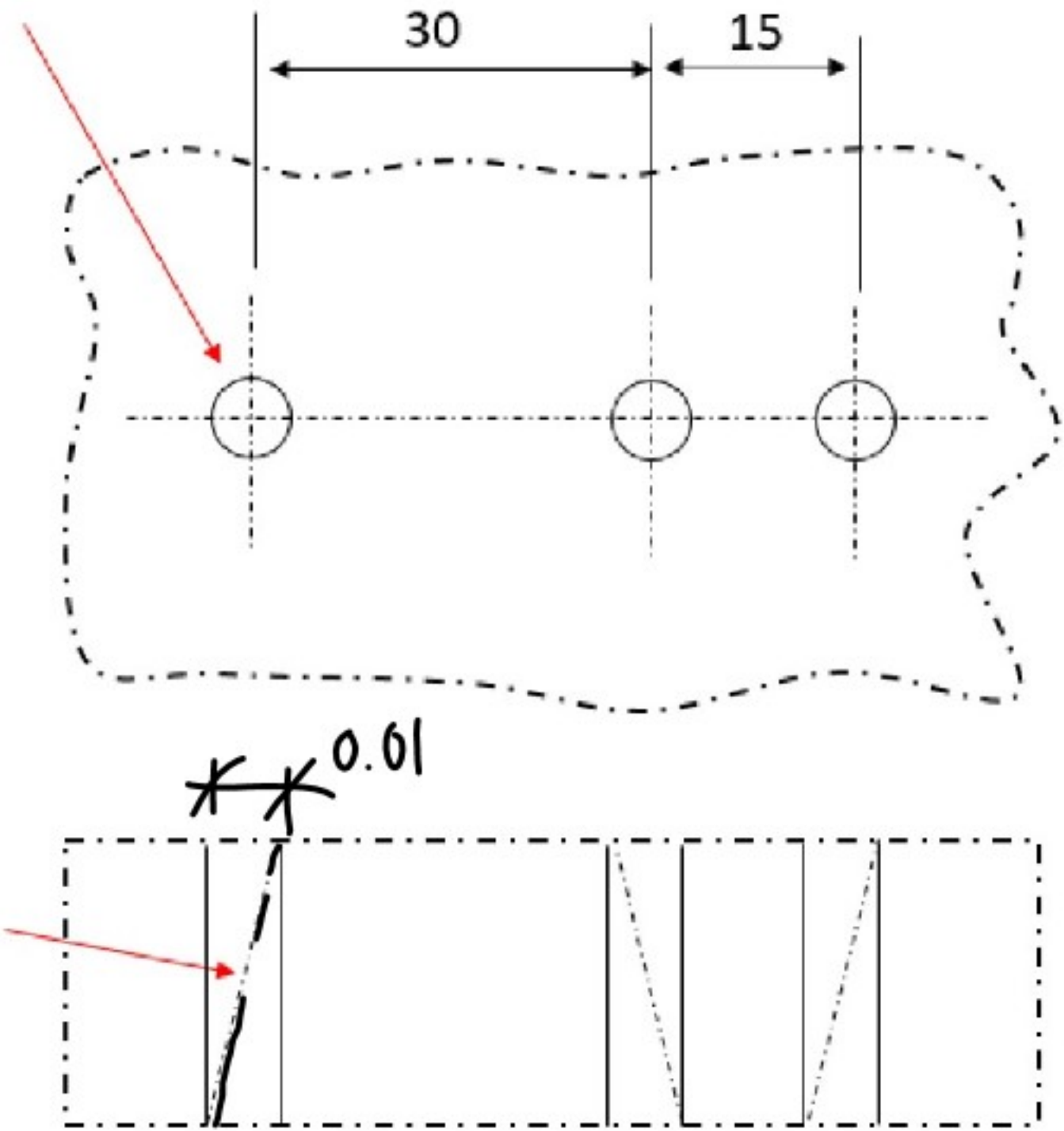
Why tolerances are necessary

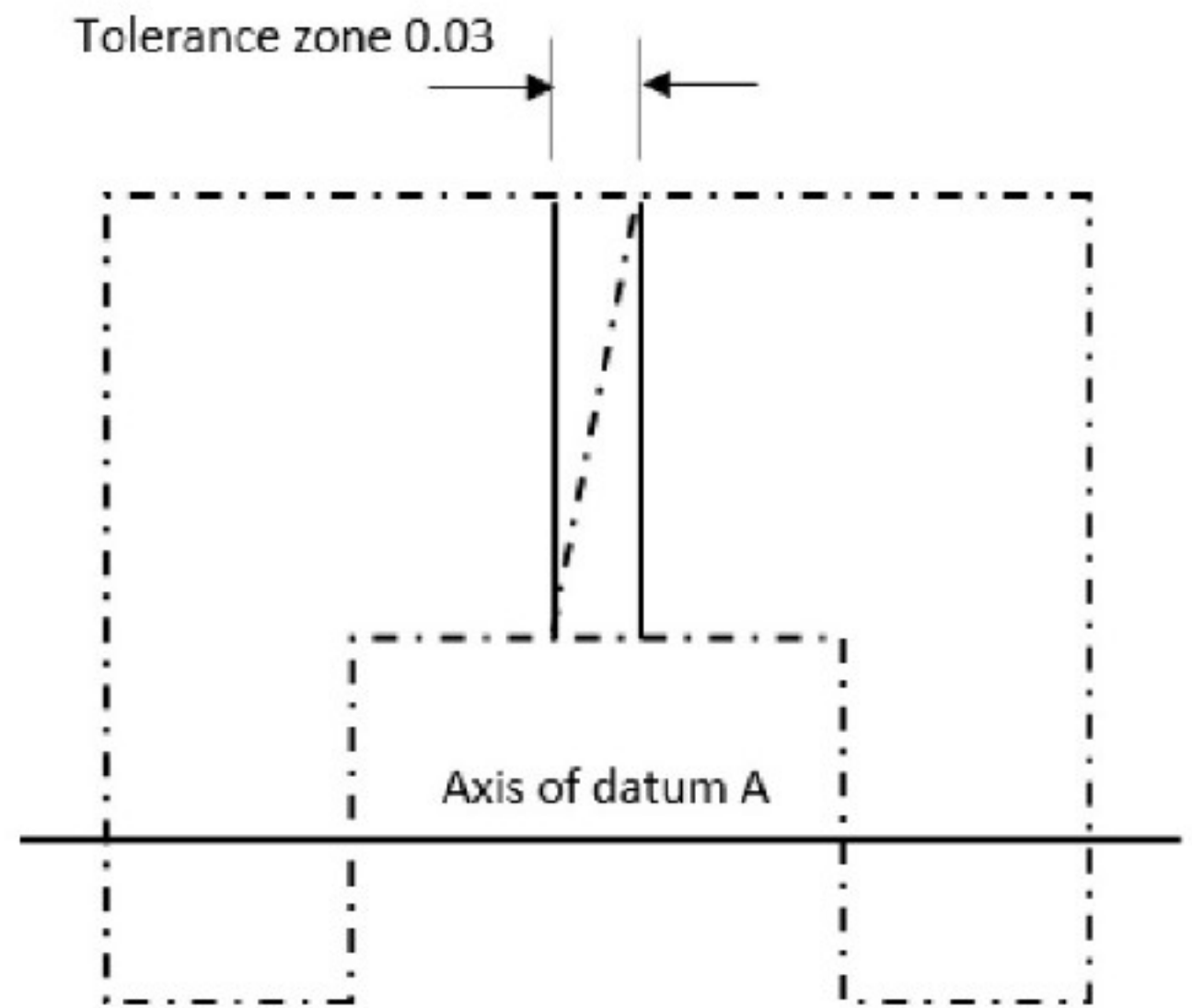
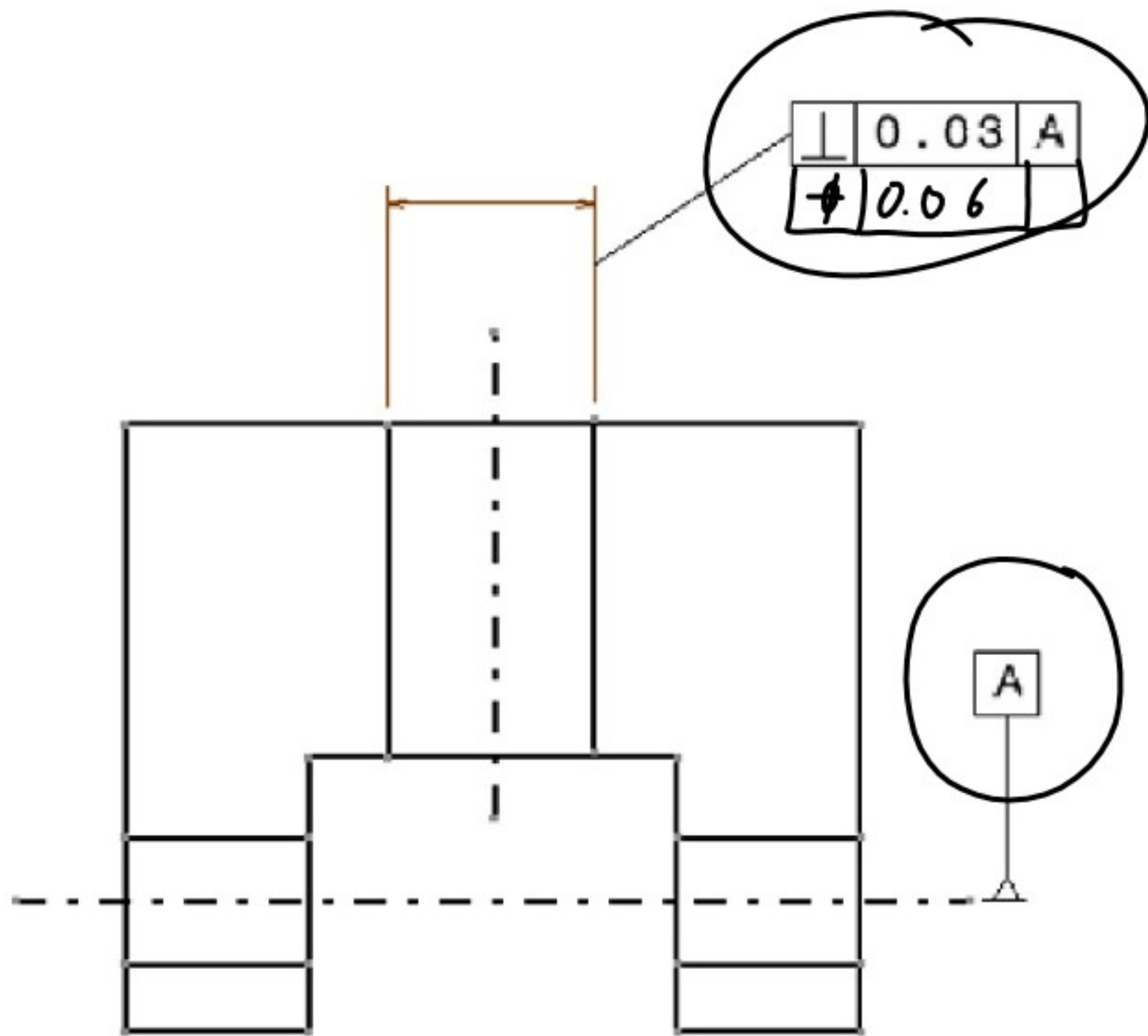


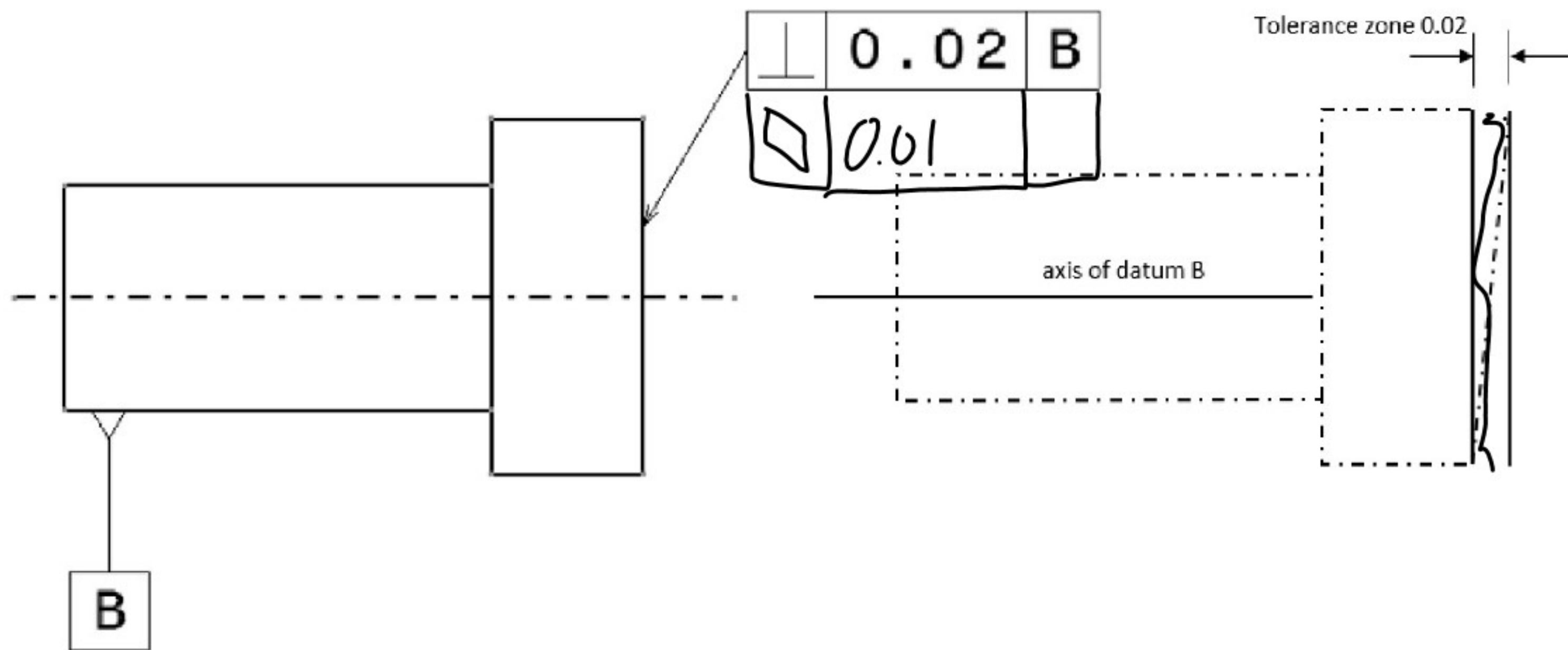
3 × cylindrical tolerance zone
with 0.01 diameter

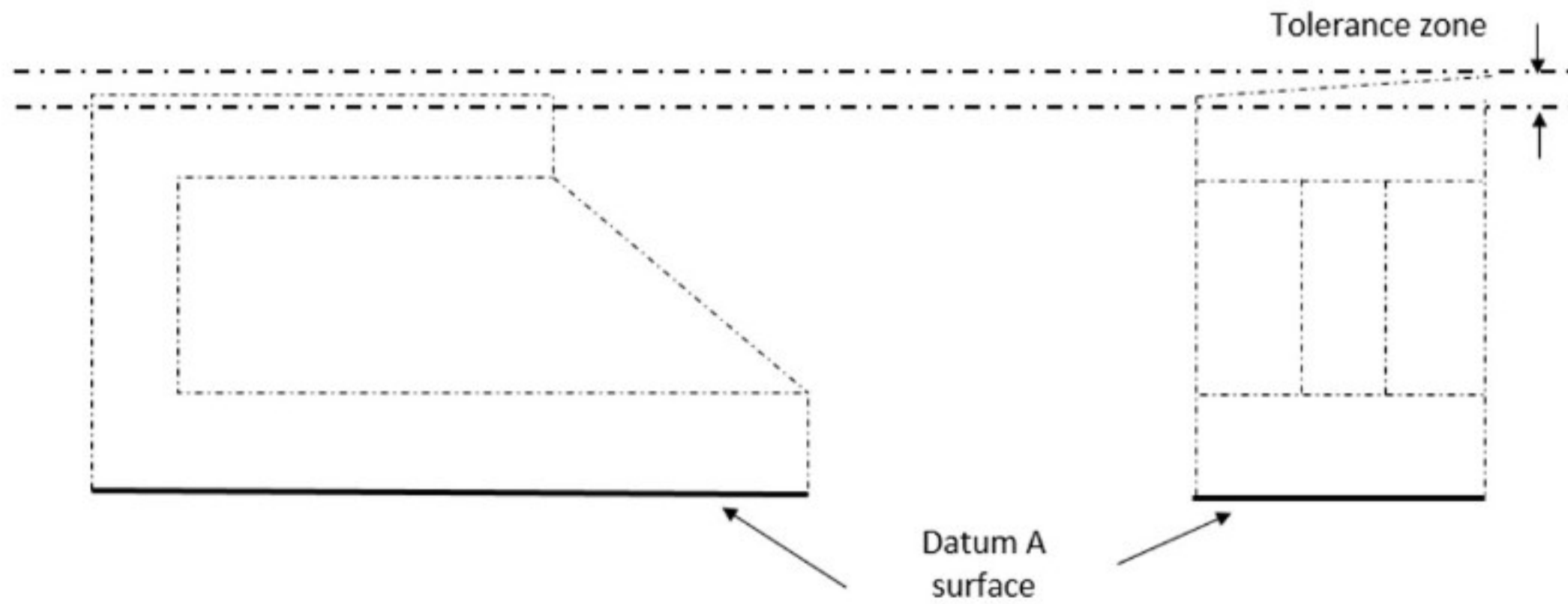
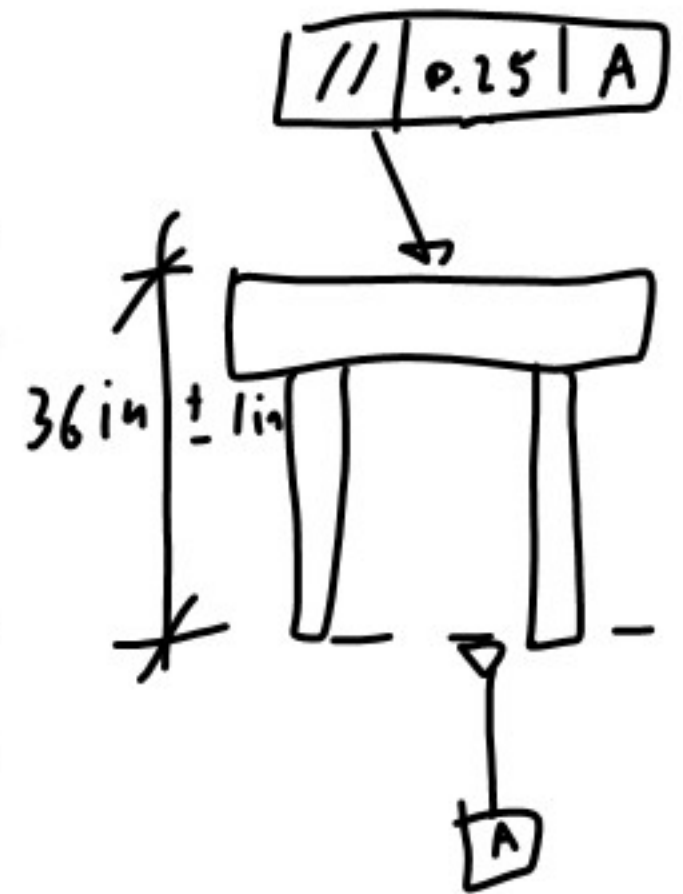
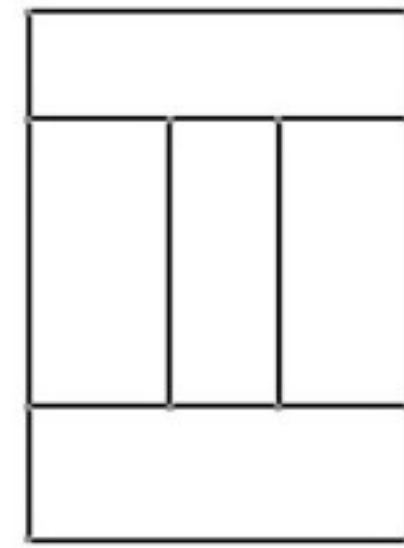
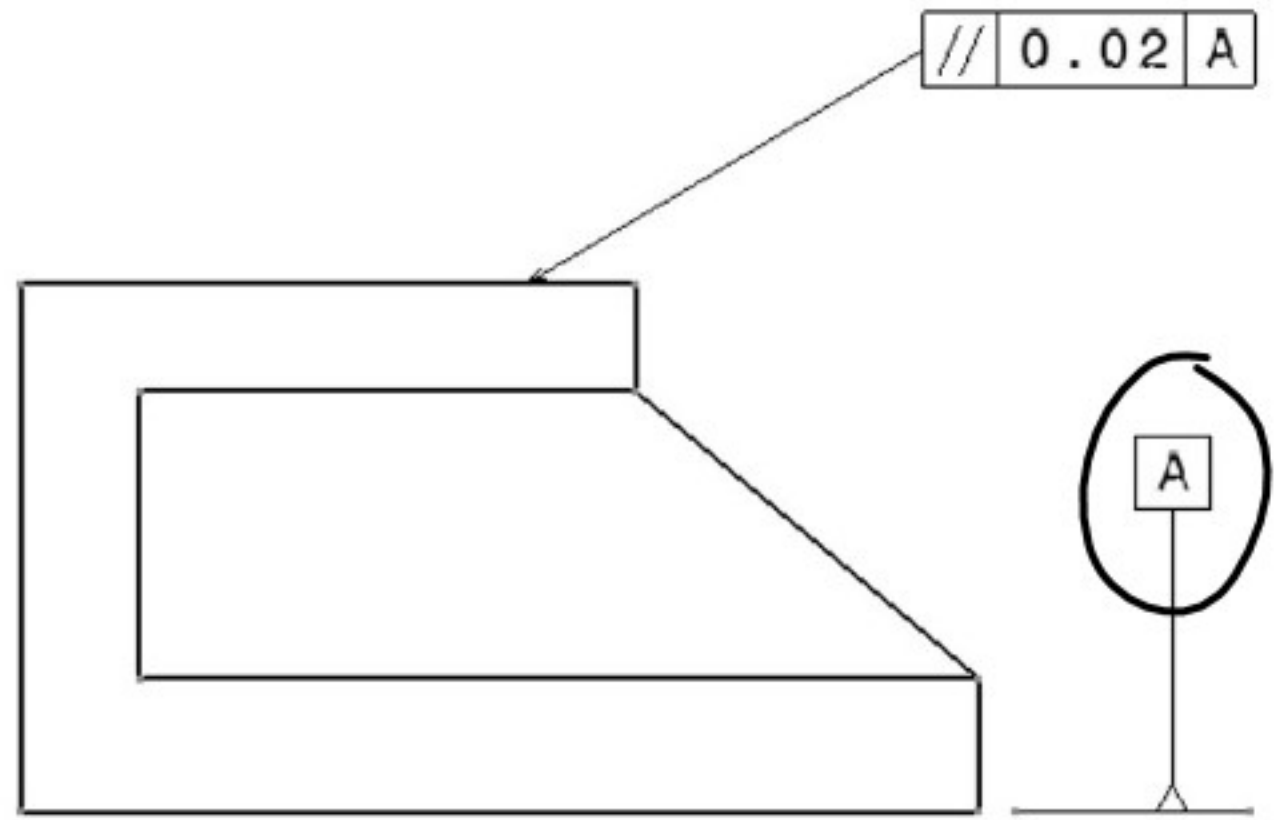


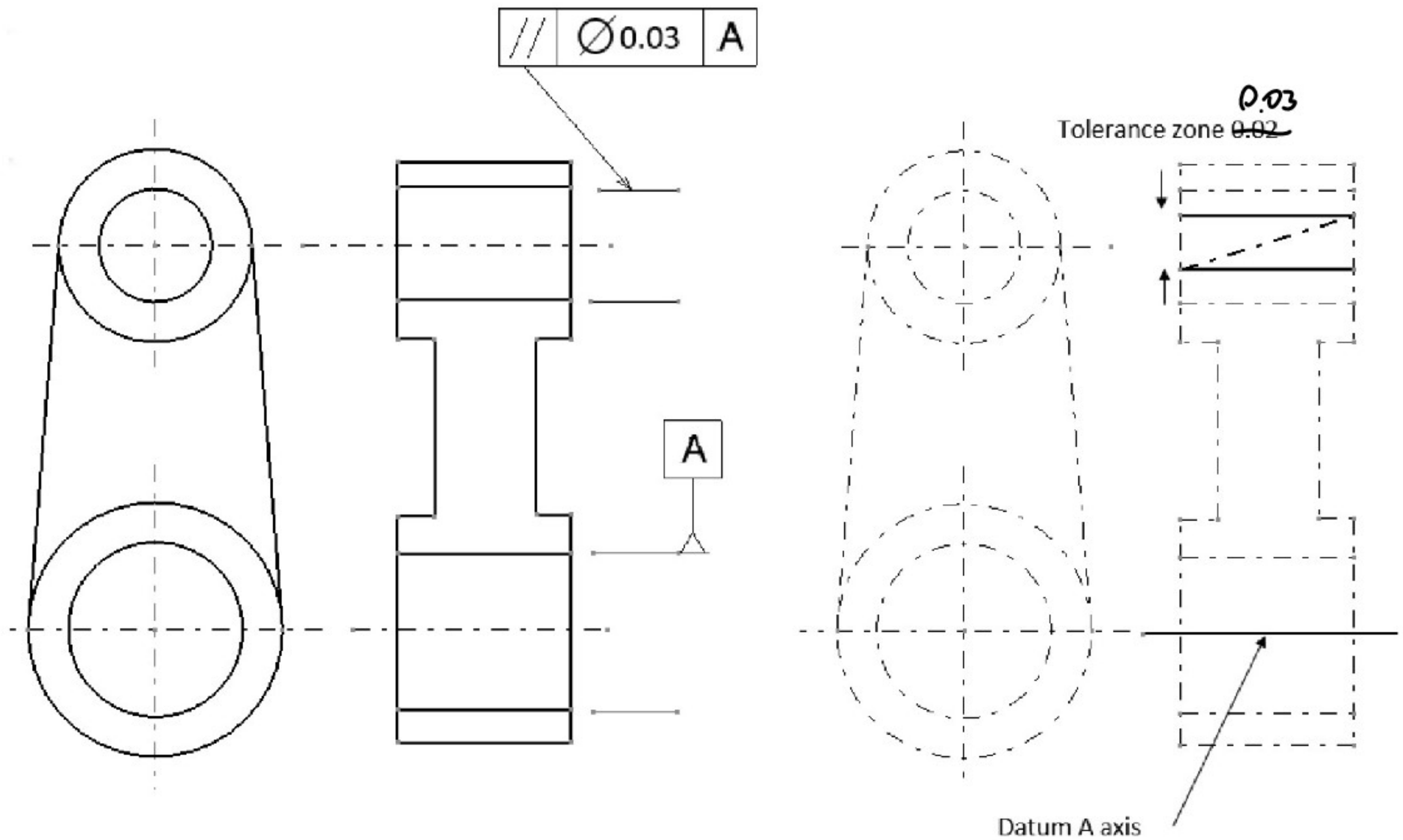
Axis within
tolerance

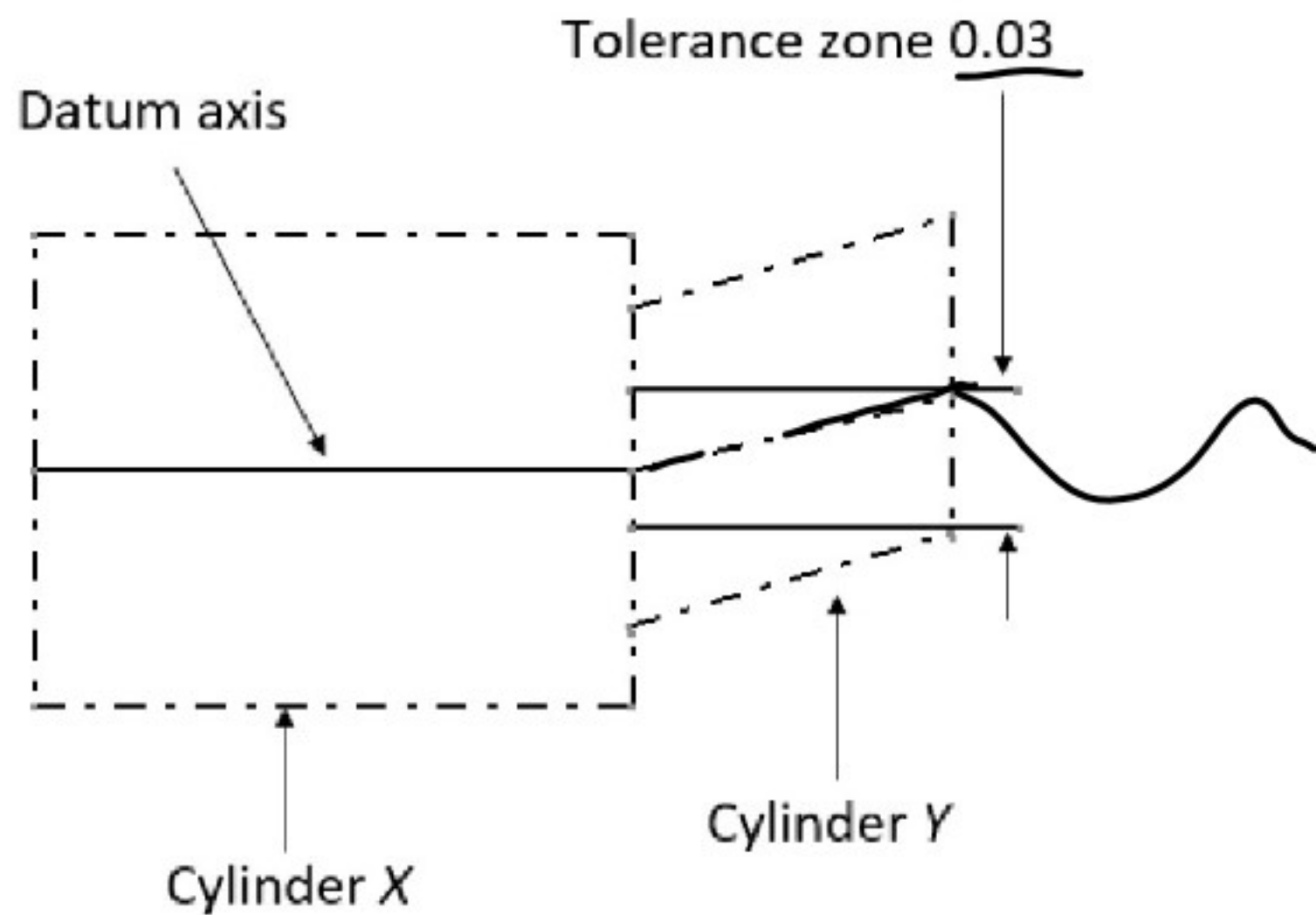
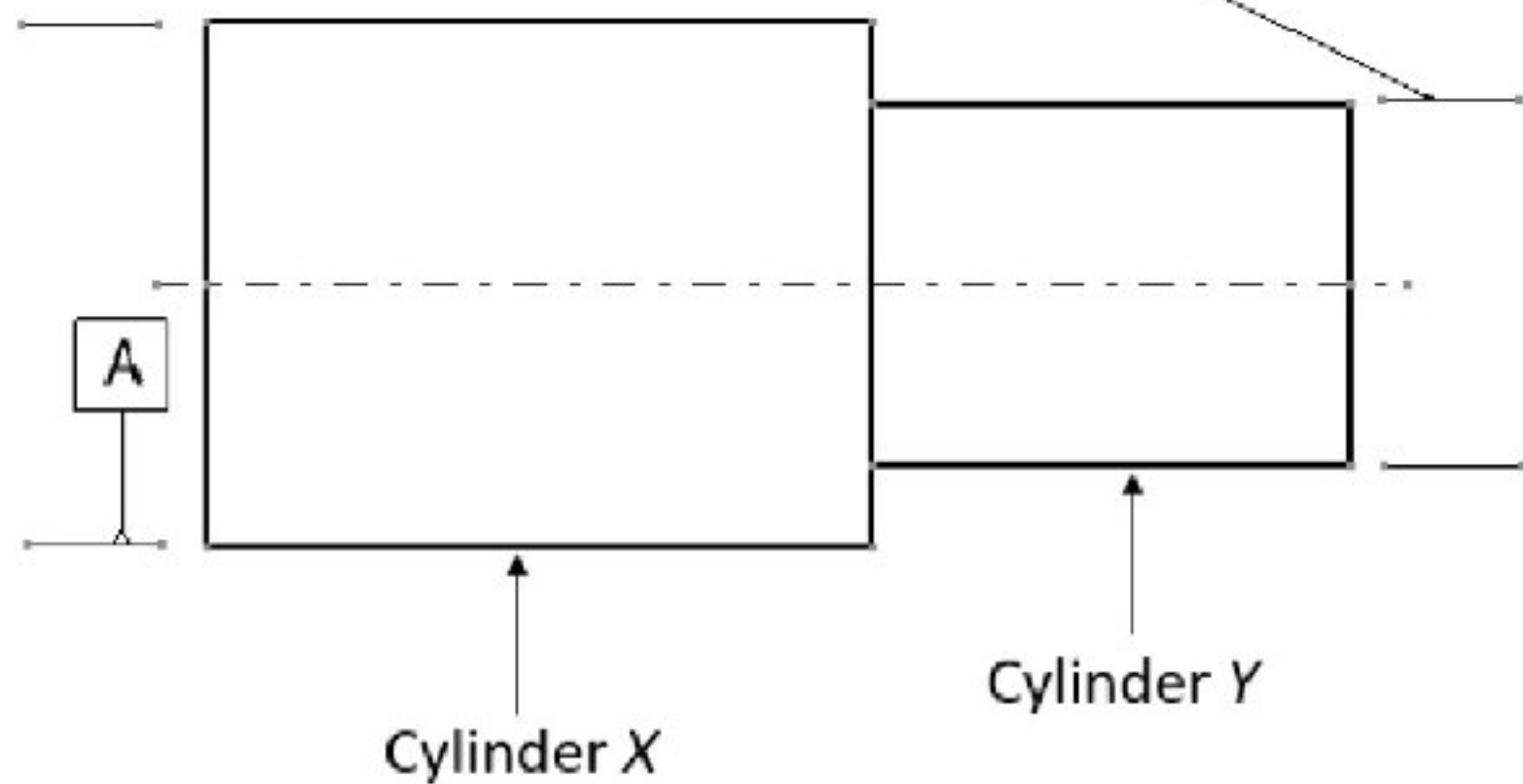
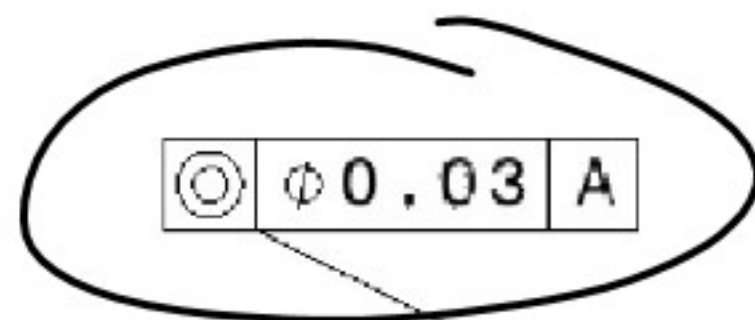
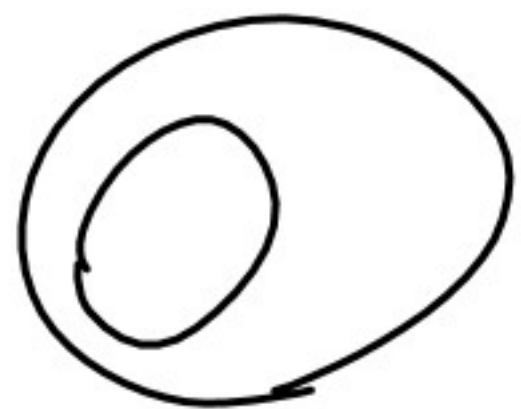


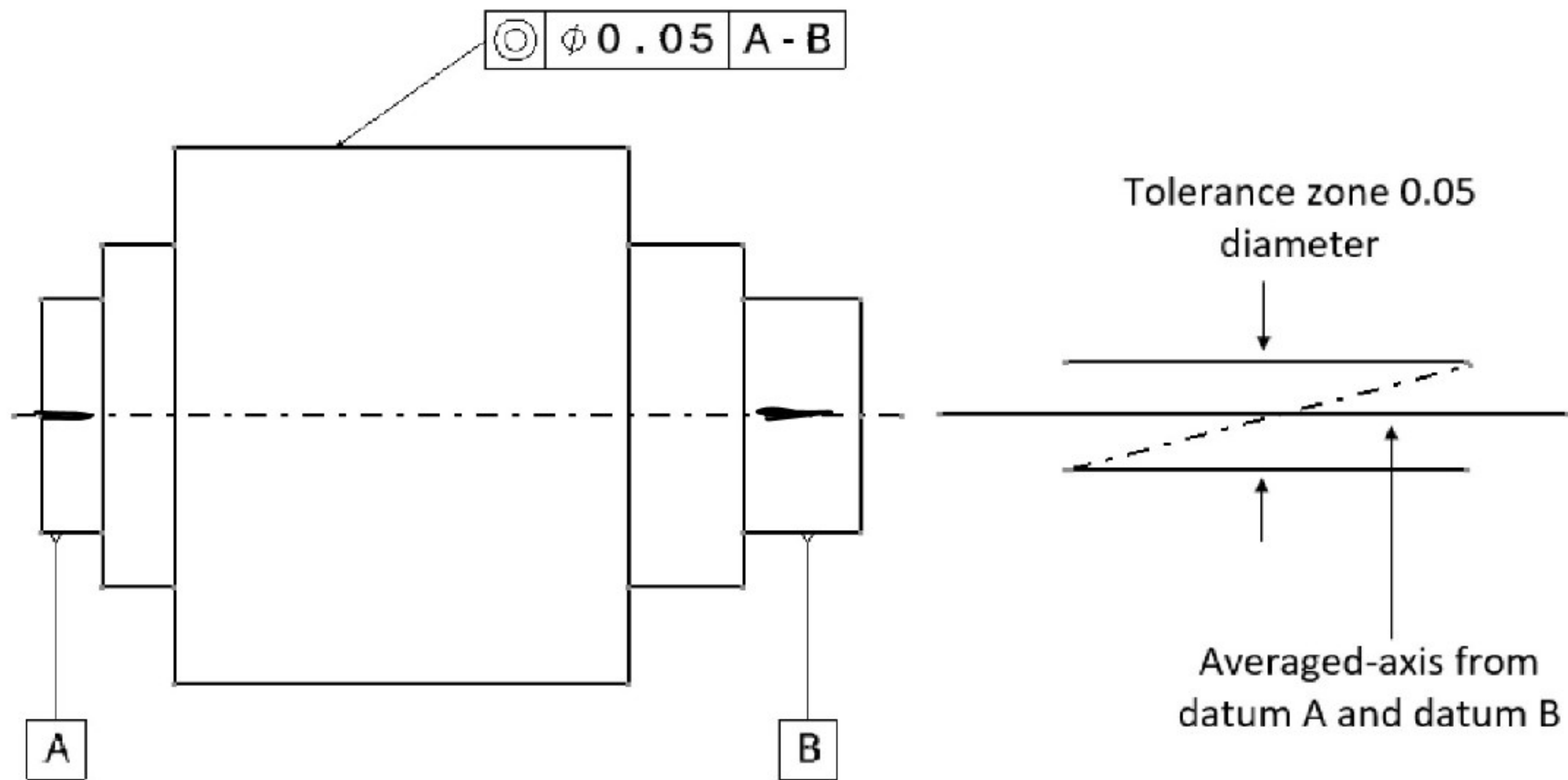


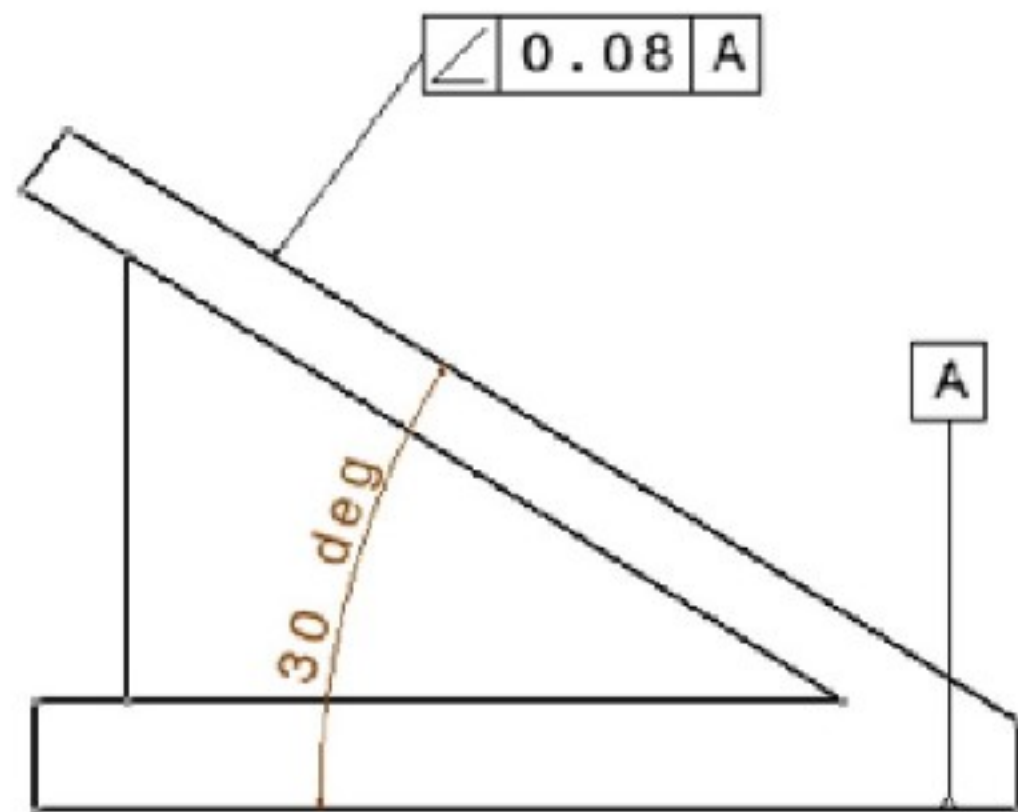




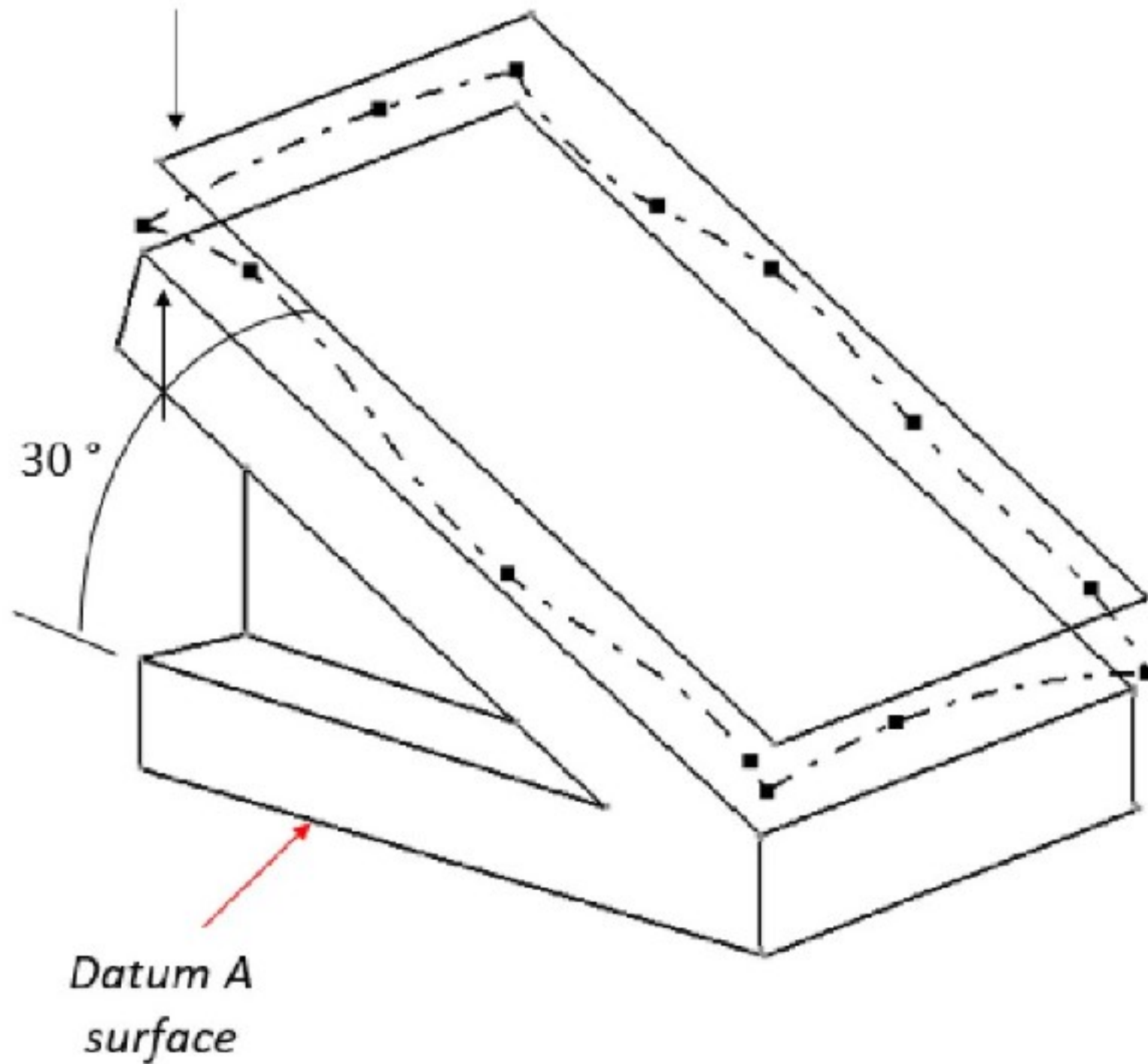


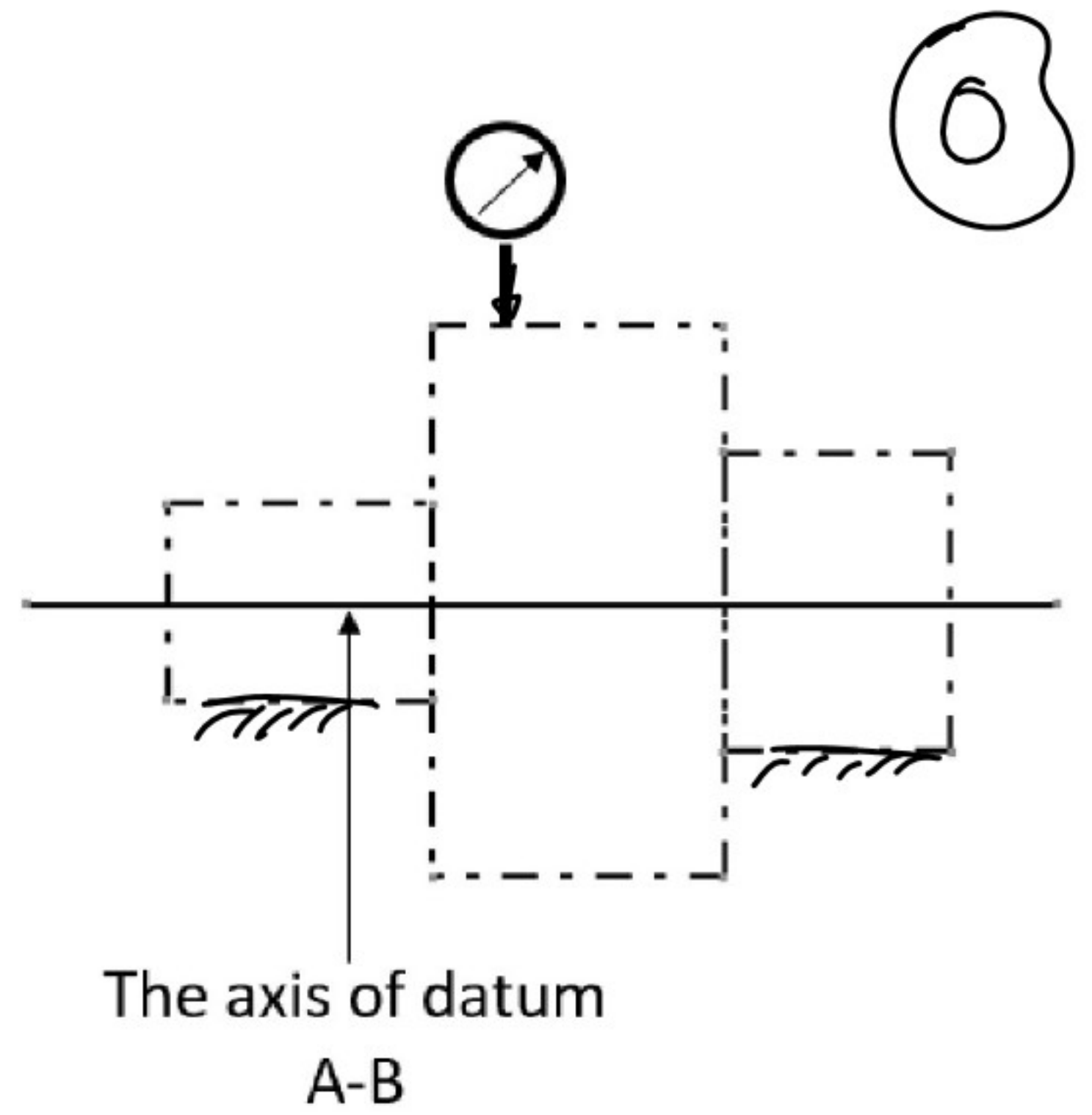
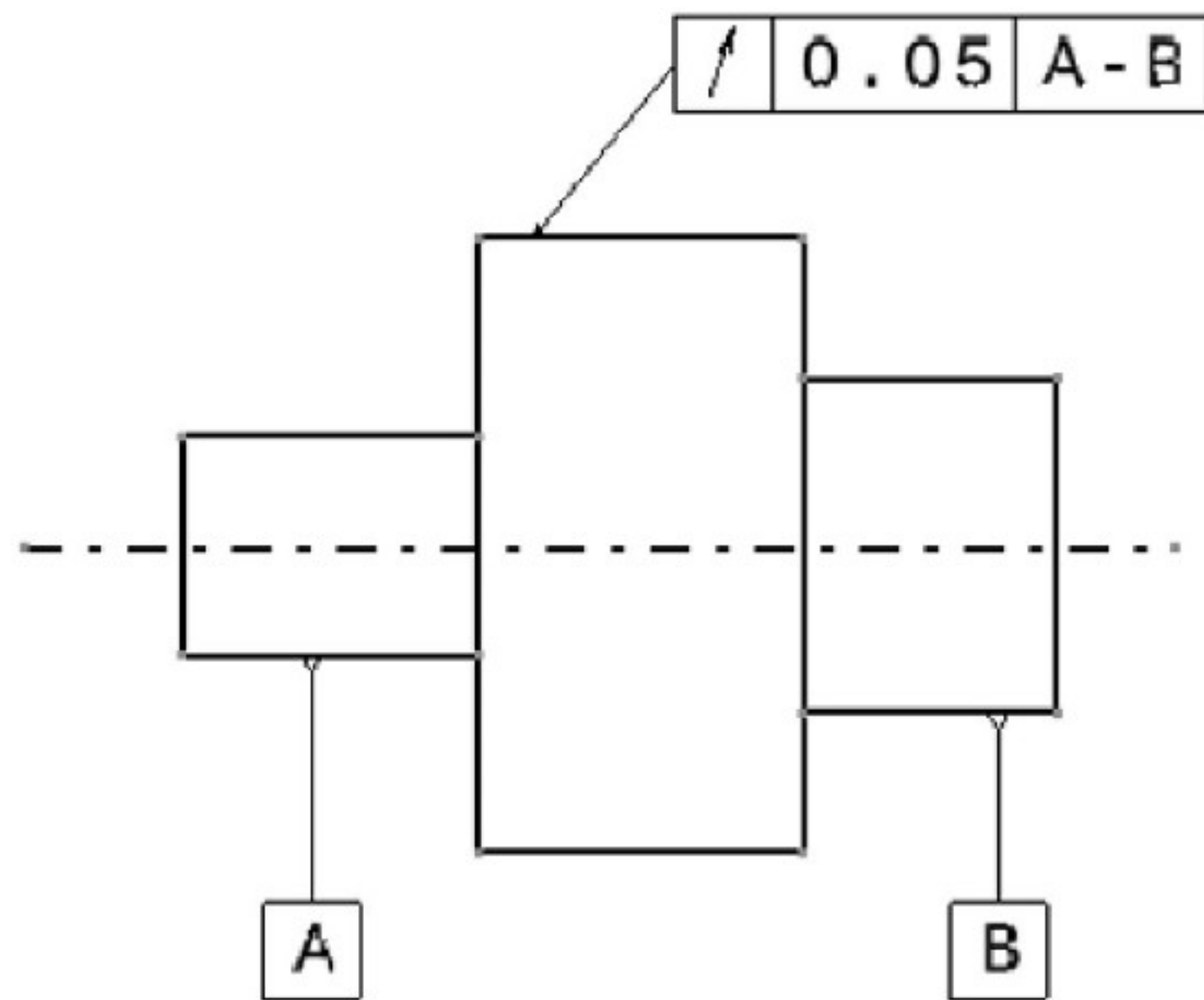


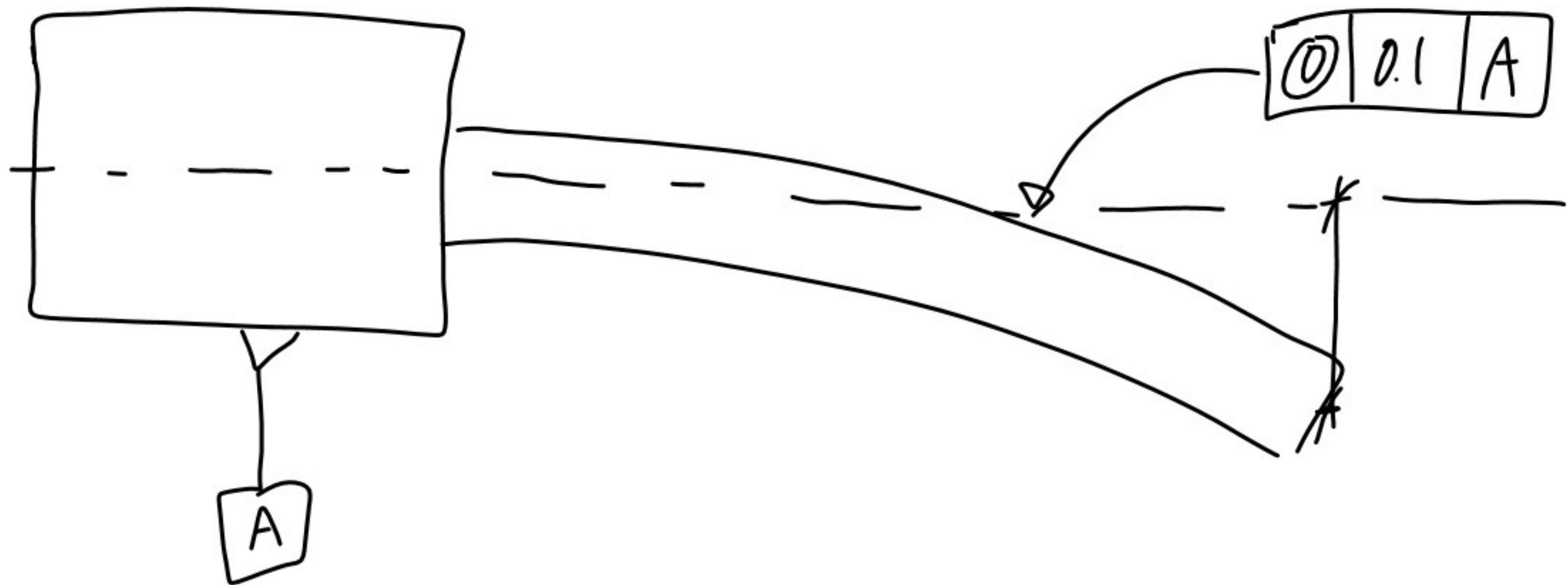




Tolerance zone ~~0.06~~ 0.08





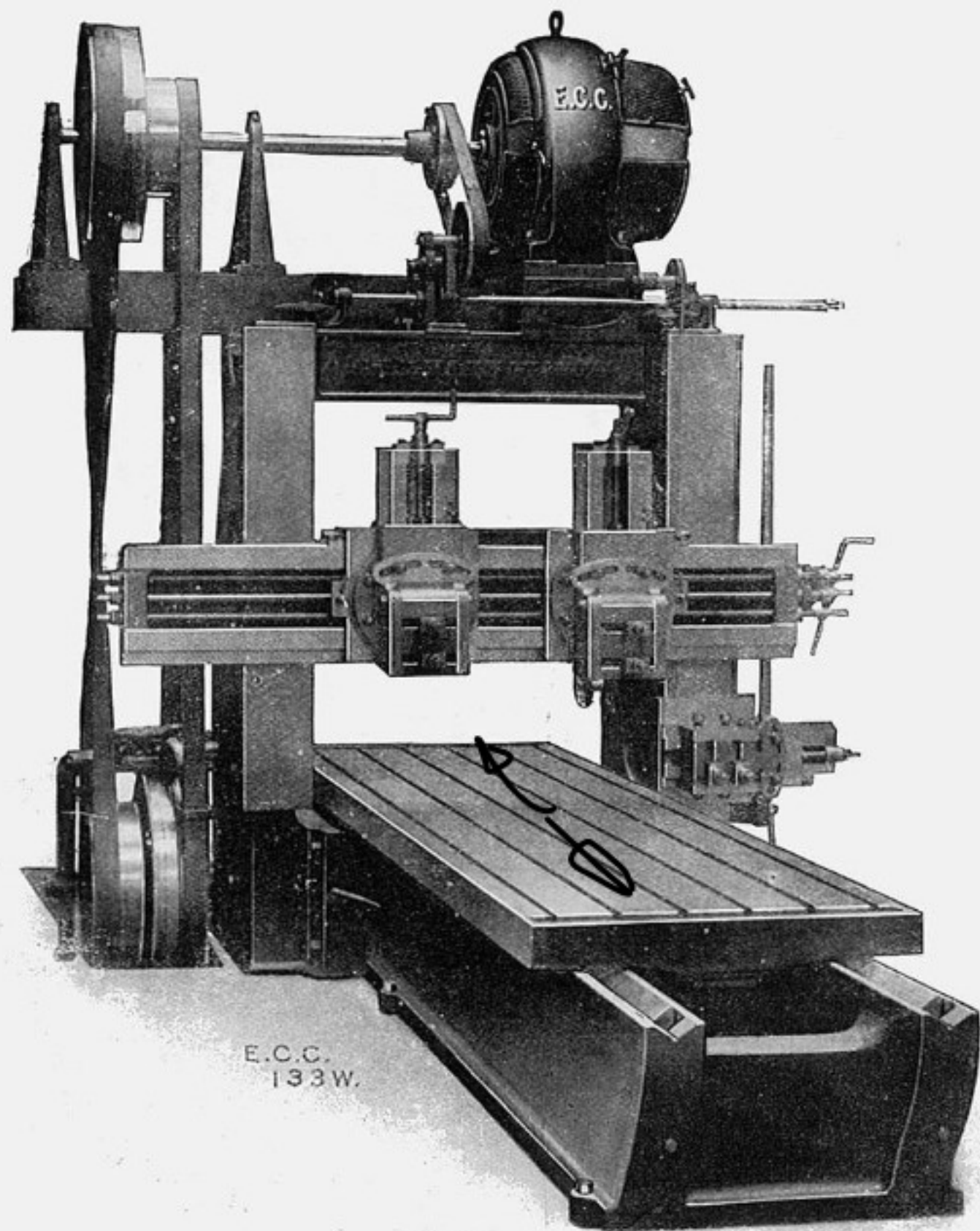


Mechanics of Metal Cutting

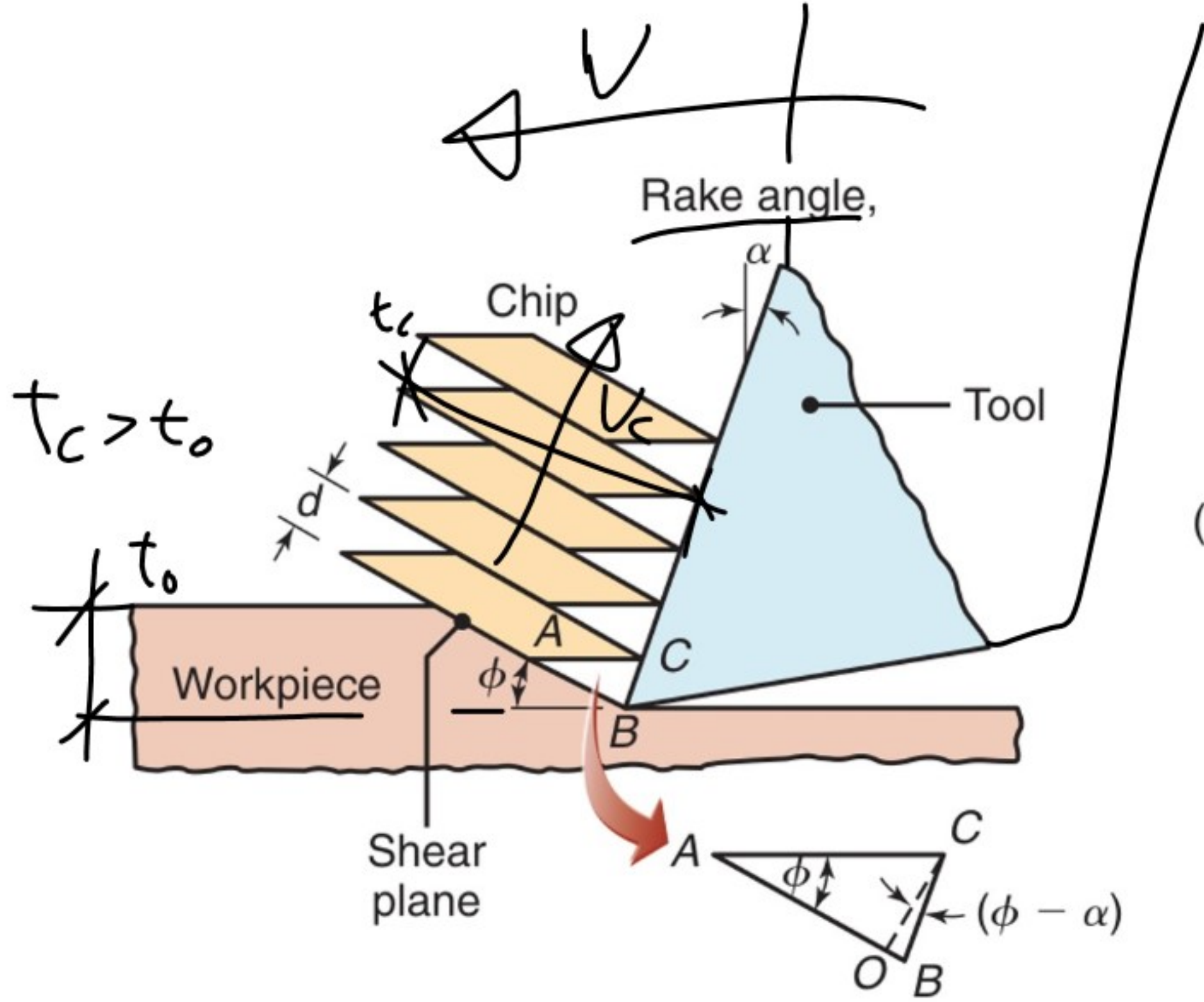
Shaper



Planer



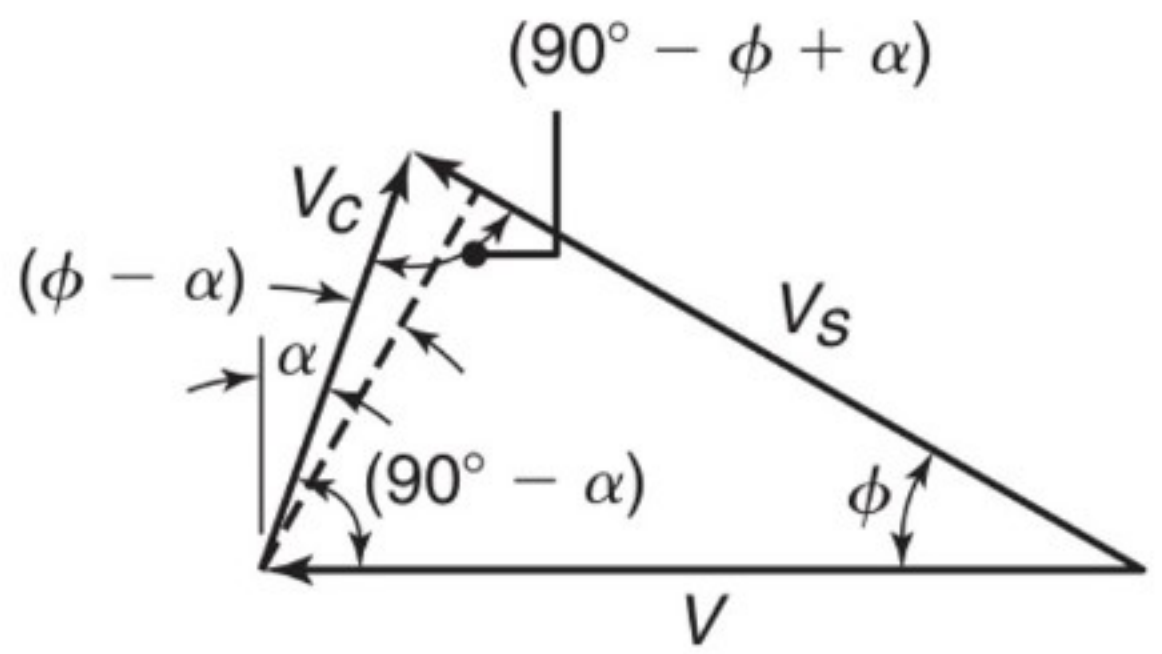
E.C.C.
133W.



$$t_c > t_o$$

Cutting ratio

$$r = \frac{t_o}{t_c} = \frac{\sin \phi}{\cos(\phi - \alpha)}$$



$$\tan \phi = \frac{r \cos \alpha}{1 - r \sin \alpha}$$

Shear Strain

$$\gamma = \frac{AB}{OC} = \frac{AO}{OC} + \frac{OB}{OC}$$

$$\gamma = \cot \phi + \tan(\phi - \alpha)$$

Friction

μ

$$\mu = \tan \beta$$

Estimate ϕ

$$\phi \cong 45^\circ + \frac{\alpha}{2} - \frac{\beta}{2}$$

$$\phi \cong 45^\circ + \alpha - \beta$$

Cutting Velocity

$$V t_0 = V_c t_c$$

$$t_c > t_0$$

$$\frac{t_0}{t_c} = \frac{V_c}{V} = r$$

$$V_c = \frac{V t_0}{t_c}$$

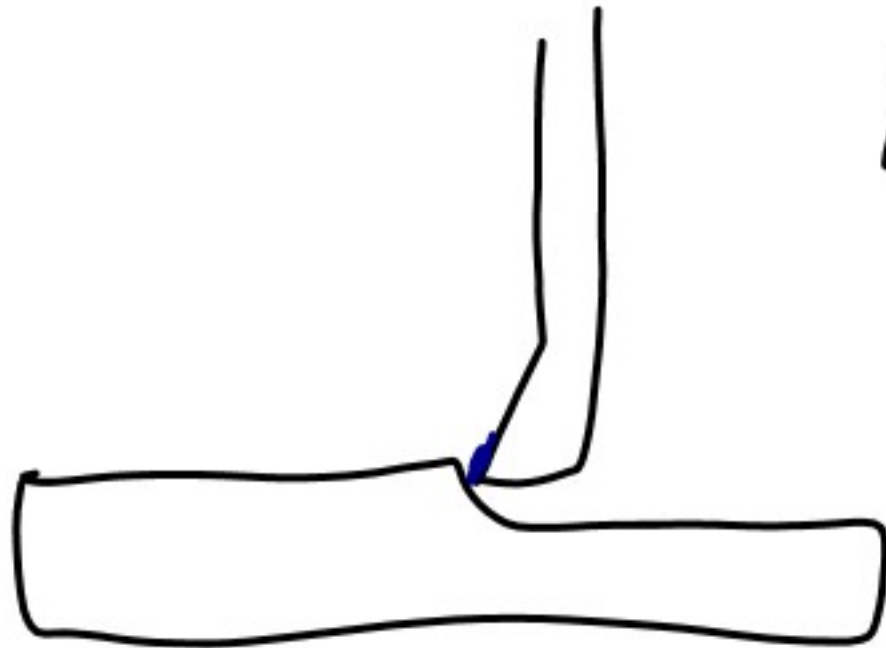
$$V_c < V$$

Chip

- Continuous
- Built up Edge

Good Finish
Tangles

Poor Finish
Low Wear



• Serrated Chips

• Discontinuous Chips

Thermal Properties

Good Finish

Brittle Materials

Chip breaker

