



The Influence of the Choice of Technological Bases on the Machining Accuracy in Milling

STEM4inclusive schools
WP2 – Toolbox

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Technological bases

To ensure the position of the surface to be machined on machine tools, the parts are fixed on the machine table or in a device that ensures a controlled position relative to the cutting edges of the tool and the direction of advance.

This position is ensured by the technological bases, which can be:

- setting bases;
- guiding bases;
- support bases.



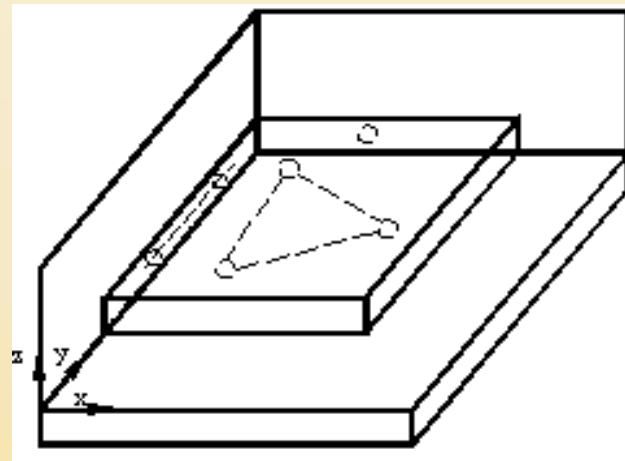
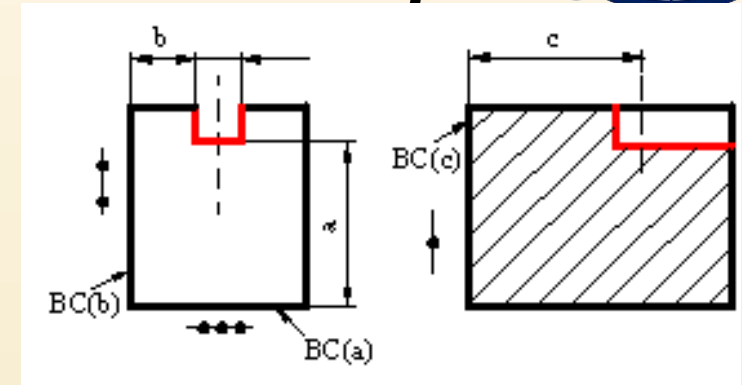


Influence of the choice of technological bases

Bases of placement – are the surfaces of the semi-finished product on which 3 degrees of freedom are taken.

Guide bases – are the surfaces of the semi-finished product on which 2 degrees of freedom are taken.

Support bases – are the surfaces of the semi-finished product on which one degree of freedom is taken.



Suppressed movements	O_x	O_y	O_z
t	*	*	*
r	*	*	*

Fig.





Influence of the choice of technological bases

In all three cases, the accuracy of the functional dimension L is calculated for a batch of parts with diameter D and tolerance δ_D .
The base error is different in the three cases.

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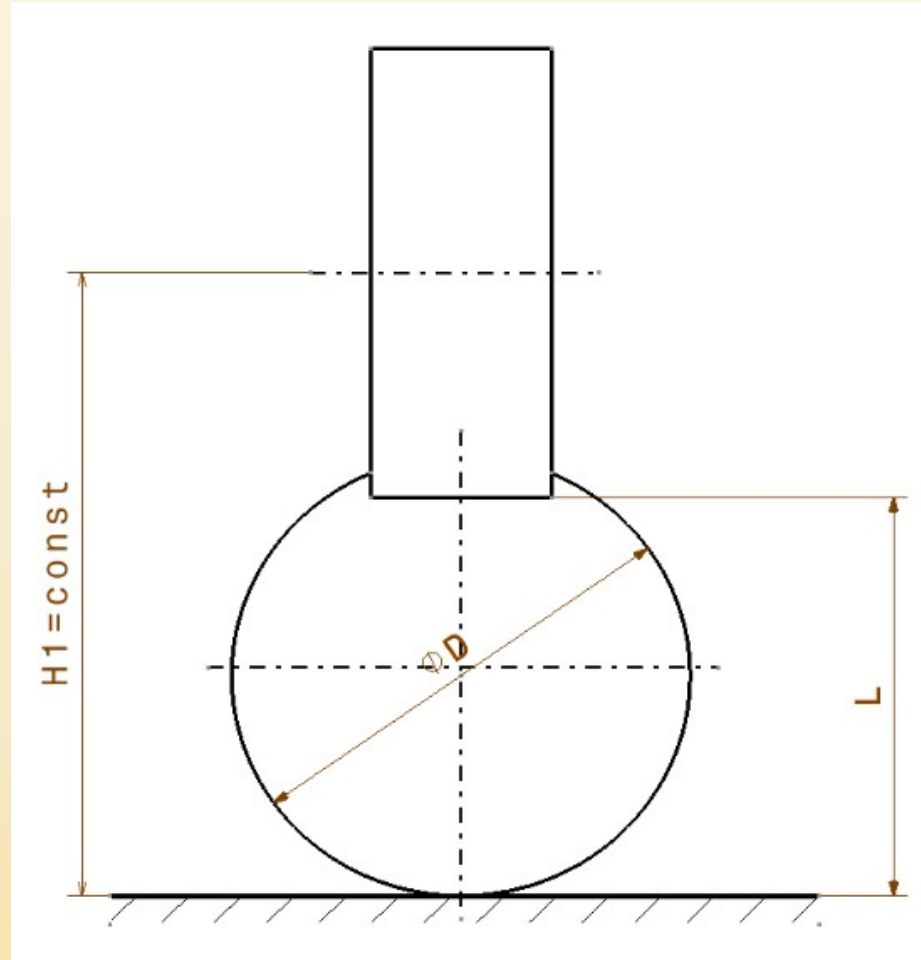


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Influence of the choice of technological bases

The measurement basis coincides with the technological basis: $\mathcal{E}_b = \mathcal{A}$



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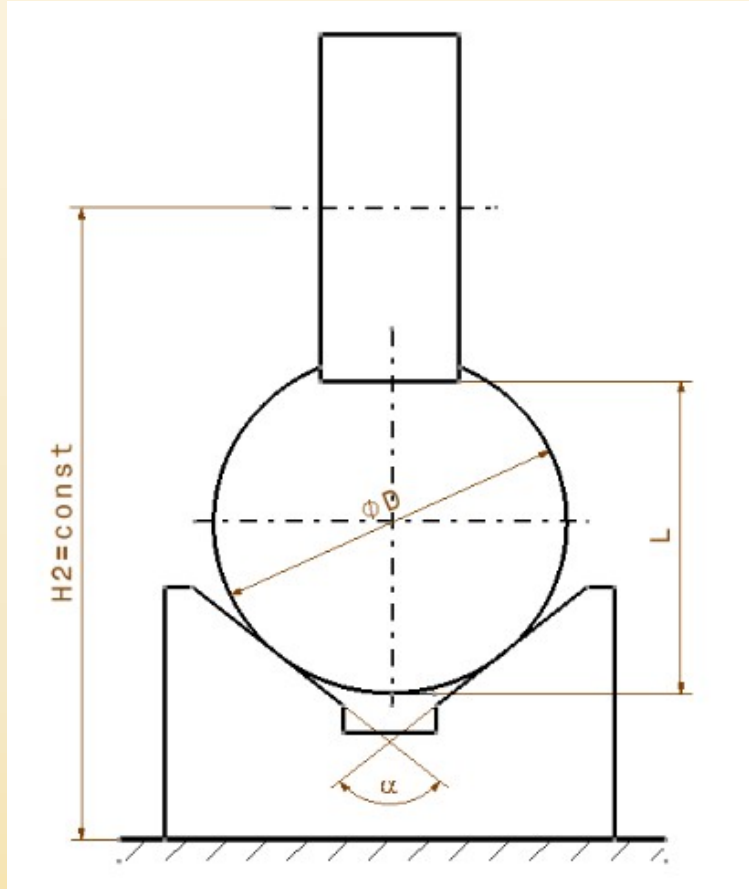
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Influence of the choice of technological bases

The blank is placed on the prism:

$$\varepsilon_b = \frac{\delta_b}{2} \left\{ \frac{1}{\sin \frac{\alpha}{2}} + 1 \right\}.$$

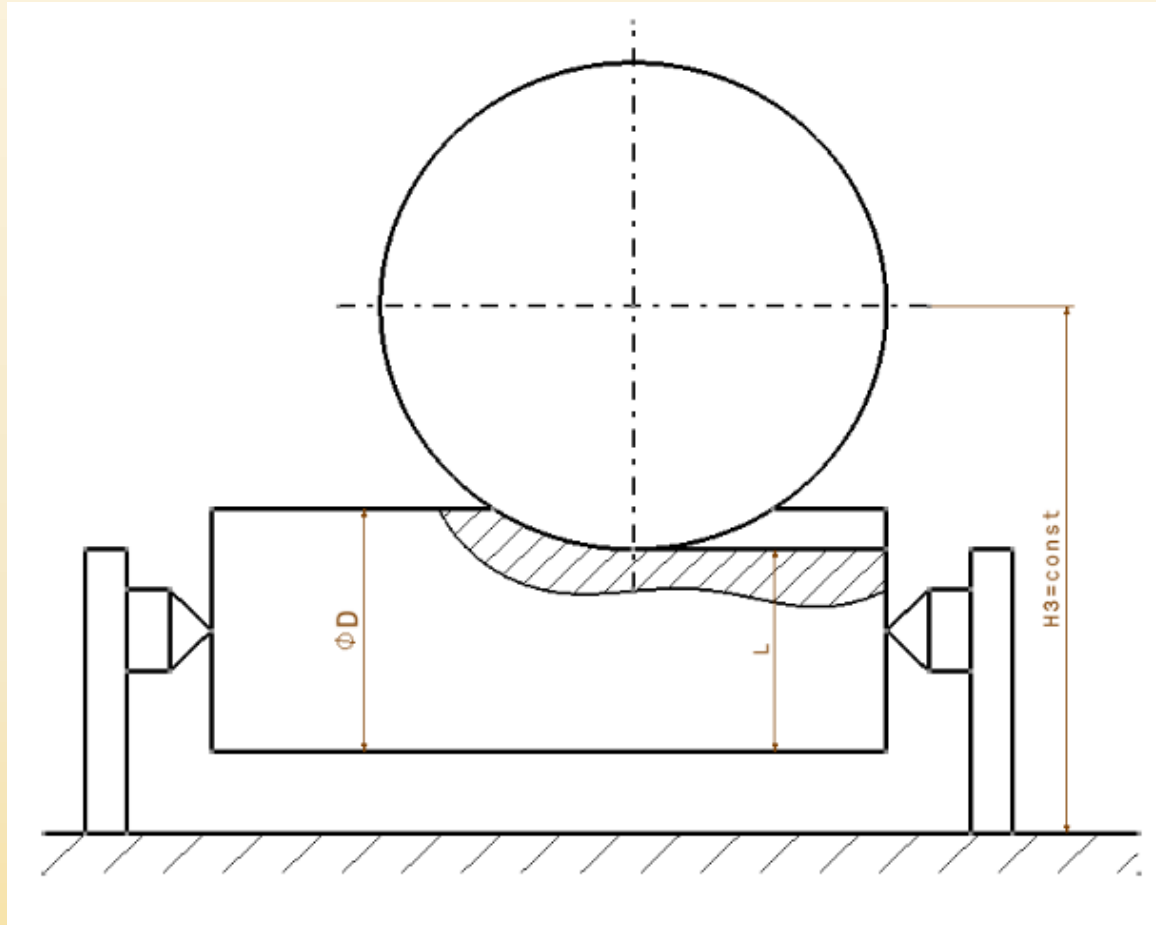




Influence of the choice of technological bases

The blank is placed on centering pins:

$$\varepsilon_b = \frac{\delta_D}{2}.$$



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