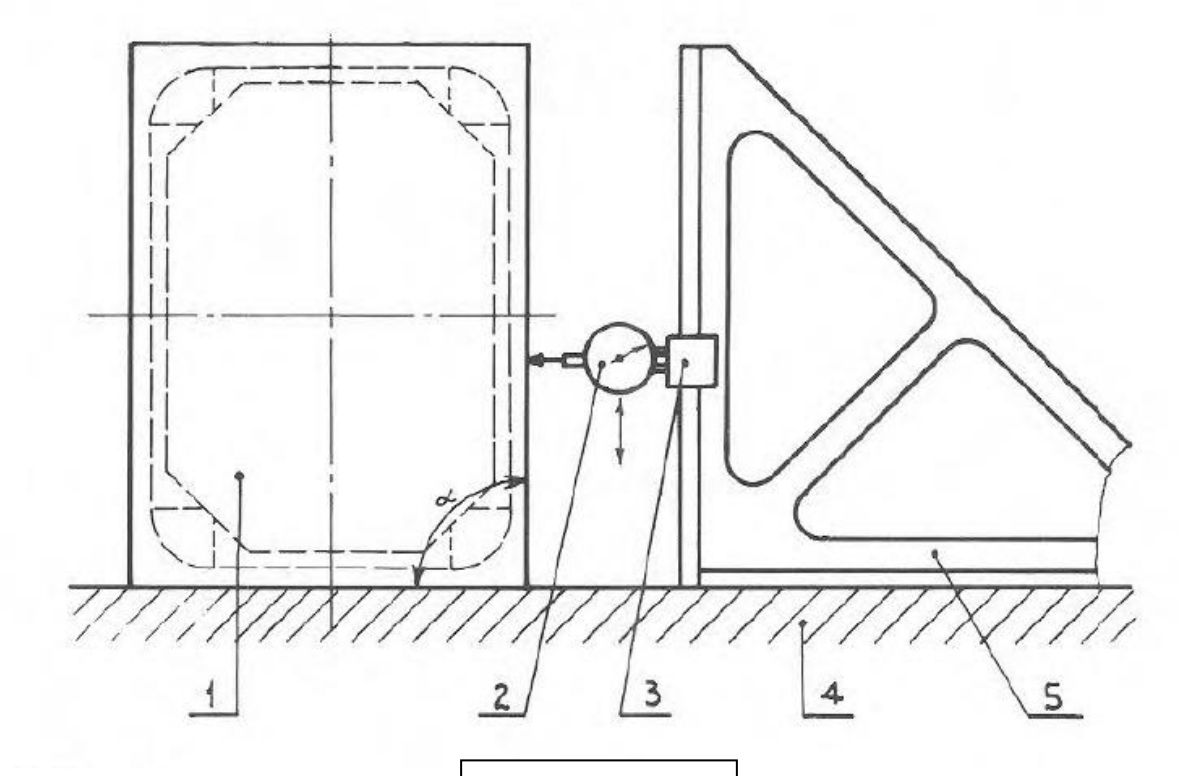
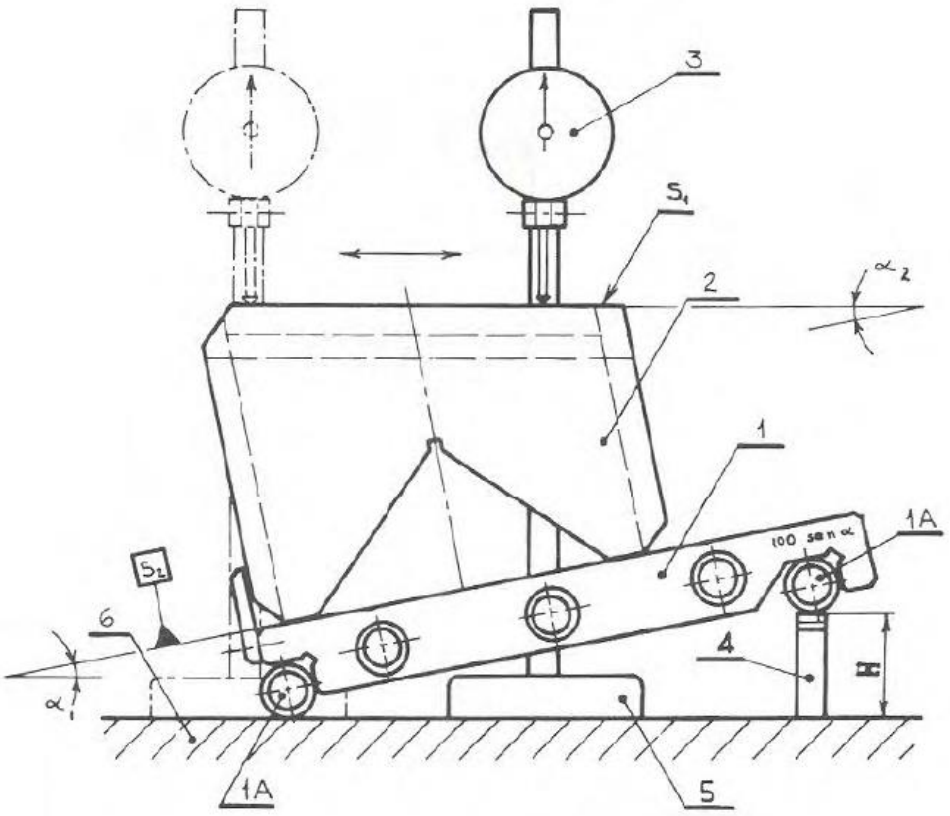
FORMAS DE MEDIR TOLERANCIAS GEOMÉTRICAS



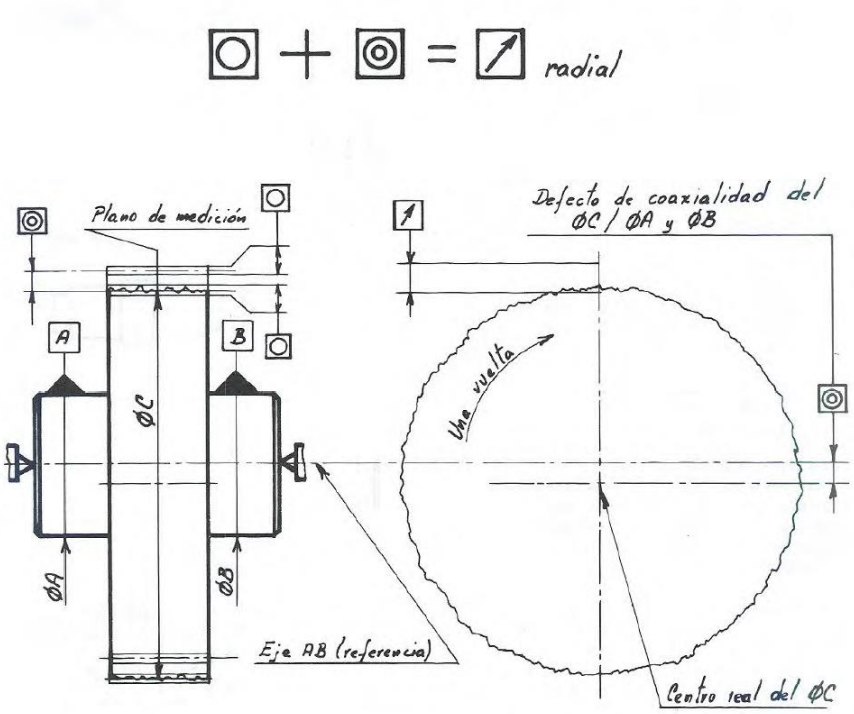
Perpendicularidad



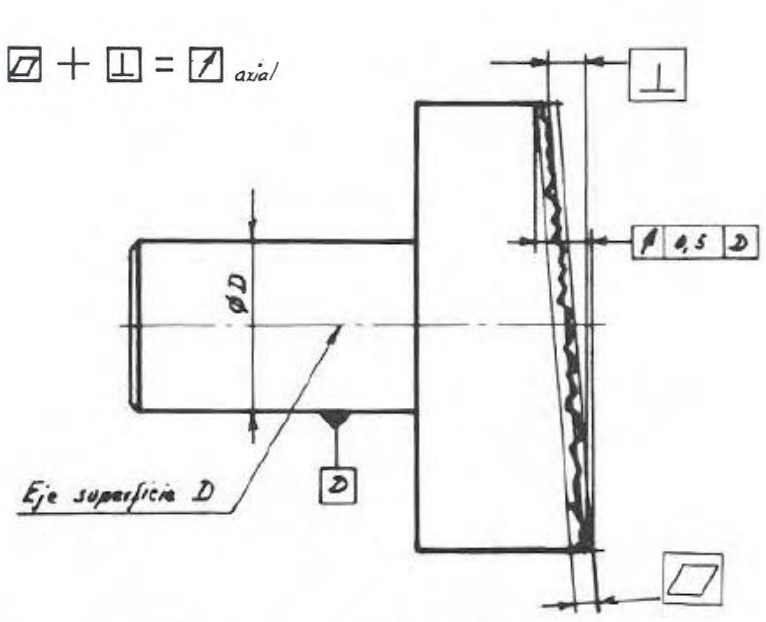
Inclinación

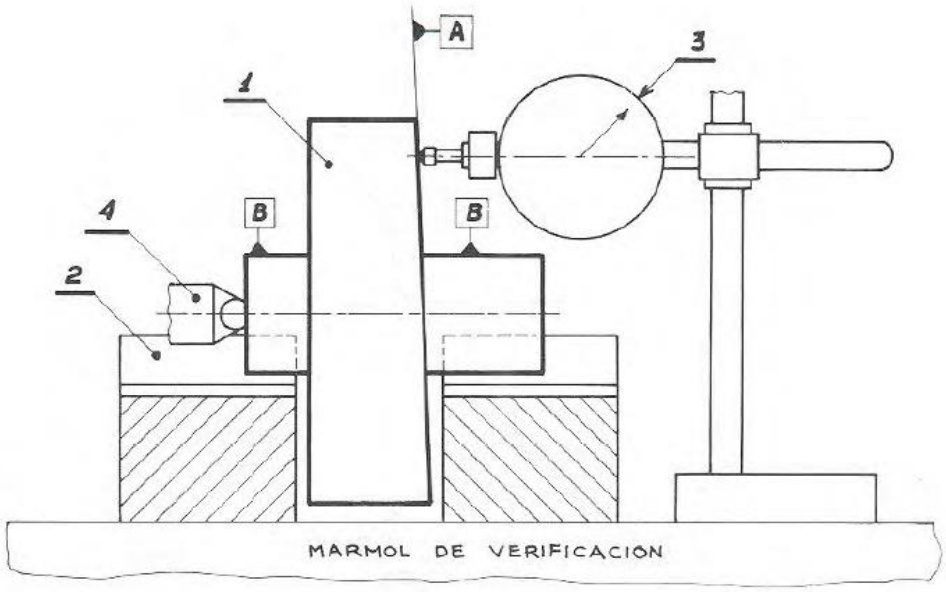
Tolerancia de alabeo

Alabeo Radial



Alabeo Axial





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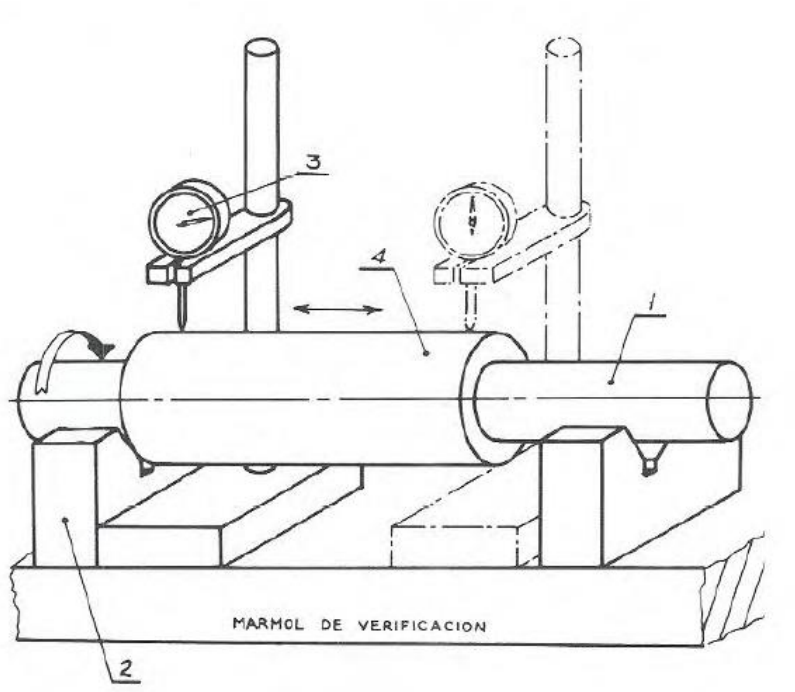
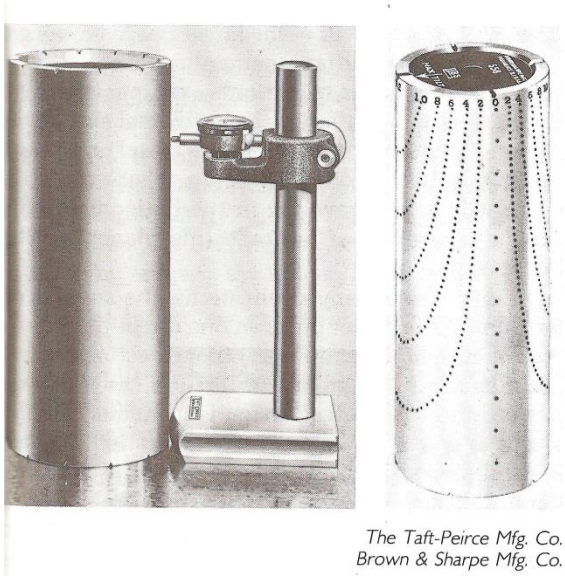


Alabeo Radial



The Taft-Peirce Mfg. Co.
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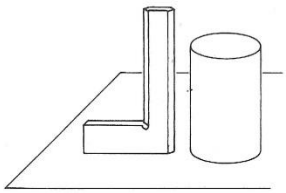
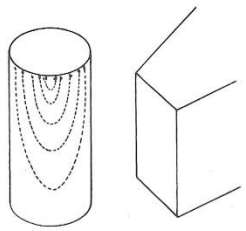
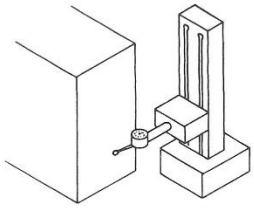
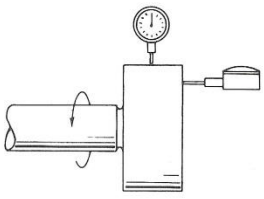
Perpendicularidad

EXAMPLES OF METHODS FOR THE MEASUREMENT OF PERPENDICULARITY

PRINCIPLES OF THE PROCESS	ESSENTIAL INSTRUMENTS	DIAGRAM	DISCUSSION
Direct contact with reference part of known squareness	Toolmaker square		Commonly used shop method for squareness checking with the aid of a toolmaker square, both the part and the tool resting on a surface plate. Gap between the edge of the square and sections along the contacted object surface is either visually observed or measured with a feeler gage.
Checking digression from a master cylinder by direct comparison	Cylindrical square, with one face off angle and with graduations on the surface		A gage cylinder with deliberately produced out-of-squareness brought into contact with the surface to be measured for perpendicularity. Curved graduation lines on the cylinder surface indicate the tilt angle of the part surface, by rotating the cylinder to an orientation producing the least light gap.
Indicating the deviations from a straight line path which is normal to the reference plane	Height gage stand with guideways for traveling indicator head		A special height gage stand with guideways to provide straight and vertical guidance to a balanced head which travels with very little friction and carries an indicator in contact with the object surface. A surface plate should support both the workpiece and the instrument.
Checking perpendicularity by measuring runout	Indicators and supporting members for the part		The lack of perpendicularity of two surfaces which are related to a common axis can be measured by rotating the part around that axis and indicating the runout of selected circular paths. The distance from the axis correlated with the runout supplies data for the angular value of the squareness error.