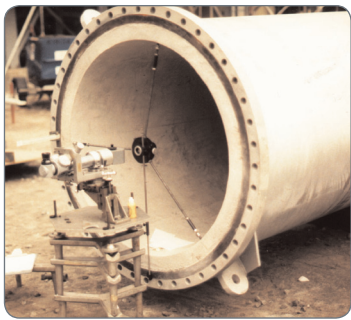


Micro Alignment Telescope

Measuring perpendicularity and parallelism of pipe end faces



Checking connecting end faces of tubes and pipes is extremely important in the civil engineering industry. The Taylor Hobson Micro Alignment Telescope is ideal for this type of application as it is robust, portable and does not require any power.

First the Micro Alignment Telescope is aligned through two spider fixtures – one at the front and the other at the rear of the pipe to form the datum line.

The spider fixture is an adjustable target holder which allows the operator to put the centre of a glass target in the centre of the bore.

In position one, the Micro Alignment Telescope is sighting through the centre line of the tube or pipe.

An optical square, mounted to the Micro Alignment Telescope, allows the operator to view at right angles to the Micro Alignment Telescope optical line within 1 second of arc. A scale on a magnetic base is placed on the end face of the pipe.

The optical square and Micro Alignment Telescope are rotated about the optical line to measure the out-of-squareness at various positions around the end face.

The Micro Alignment Telescope is then moved to position 2 and sighted through the two spider fixtures again, ie along the same datum line. The optical square is again used to look at the out-of-squareness on the second end face.

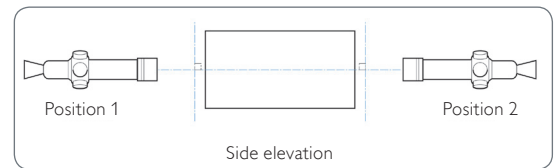
Not only have the end faces been measured for squareness to the centre of the pipe, but as the same datum line is used in position 1 and 2 the

end faces are measured parallel to each other.

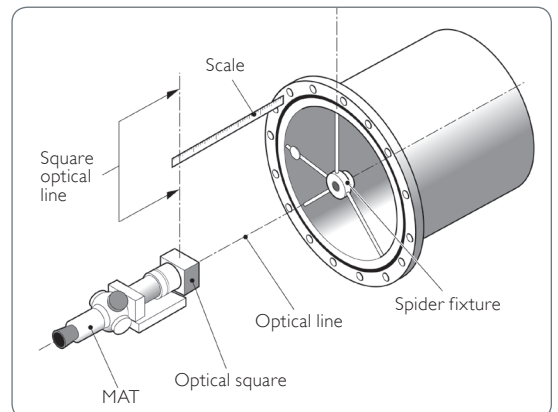
Various versions of this application theme include using two matched targets on the outside of the pipe as the reference line, or even a target on a sledge pulled through the tube.

“Taylor Hobson’s Micro Alignment Telescope is ideal for checking perpendicularity and parallelism of pipe and tube end faces in industry.”

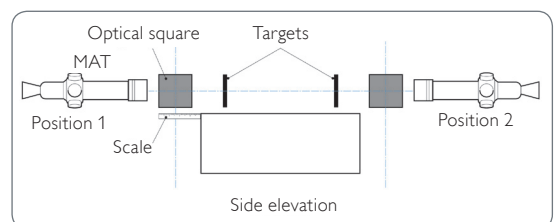
Position 1



Out-of-squareness measurement



Position 2



Our electro-optical metrology product range comprises:

Micro-Alignment Telescope



Used for checking and setting for example:

- Alignment: (series of bores or bearings)
- Squareness: (column to a base)
- Parallelism: (series of rollers)
- Level/flatness: (machine bed foundation)
- Straightness: (rails or guideways)

...with its optical and mechanical axes aligned to within 3 seconds, a typical accuracy of 50–70 um at 30 m is achievable.

Autocollimators

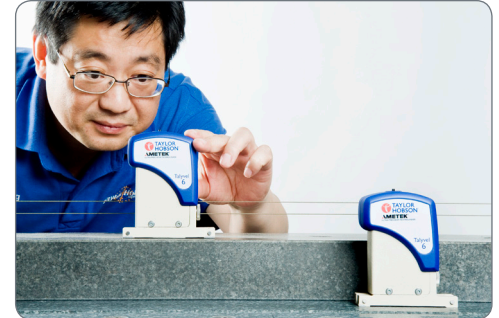


Used for measuring for example:

- Angle: (indexing head accuracy)
- Straightness: (machine tool slides in two axes)
- Squareness: (spindles to slideways)
- Parallelism: (slideways)

...from inexpensive visual to dual axis digital systems capable of measuring 0.01 second, equivalent to 50 nm per m.

Electronic Levels and Clinometers



Used for angle and level measurements:

- Level/flatness: (granite tables)
- Straightness & twist: (machine slides)
- Squareness: (of machine columns)
- Angle: (remote monitoring of movement of structures)

...from full 360 degree measurement to level measurements to 0.1 second.

Windows® based software programs are available for computer processing and graphic output of flatness, straightness, squareness, twist and polygons up to 72 faces.

Calibration of all instruments is traceable to international standards.

This application note demonstrates just one of the applications for the Taylor Hobson electro-optical metrology range.

Contact Spectrum Metrology to discuss your own measurement requirements.



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