Roughness measuring systems from Jenoptik – Surface parameters in practice

Selection of the cut-off (profile filter) according to ISO 4288:1998 and ISO 3274:1998

The cut-off is selected depending on the workpiece surface either according to the valley spacing or the expected roughness values. At the same time the total evaluation length and the corresponding traverse length are defined according to the standards. Deviations are necessary if the workpiece does not allow the required traverse length. See drawing entries.

Periodic profiles
E.g. turning, milling

Measuring conditions
- sampling length
- evaluation length
- traverse length
- cut-off

Aperture selection

- ISO 1302:2002

Specifications for requirements

- Ra – arithmetical mean deviation of the assessed profile
- Rz – maximum height of the roughness profile: average value of the five Rz values/peak
- RSm – mean width of the profile elements
- Rpk, Rvk – reduced peak height, reduced valley depth
- Mr1, Mr2 – material ratio
- RSm – mean width of the profile elements
- Rvk – reduced valley depth
- Mr1, Mr2 – material ratio

Evaluation of measurement results

According to ISO 4288 the surface measurement characteristic made when the highest values are to be expected (visual determination).

According to ISO 4287 the surface measurement characteristic made when the highest values are to be expected (visual determination).

Material ratio curve

The material ratio curve indicates the material ratio as a function of the section height. The material ratios are valid irrespectively of the evaluation length selected.

Division of a surface

Surface profiles – total height of the profile

The surface profile is measured two-dimensionally using the tracing system.

The utilized primary profile (P-profile) is the actual measured surface profile. Filtering in accordance with ISO 11562/ISO 4287 produces a measure profile (l-profile) and the roughness profile (D-profile). The value for the determination of the roughness profile is defined as the difference between the measure profile and the average line.

Following ISO 4287, all parameter definitions are valid for both the roughness profile as well as for the primary and waviness profiles. The profile type is identified by the capital letter P, R, or W.

The total height Rz, Mr in R of the respective profile type is the maximum height between the highest peak and the deepest valley of the evaluation length profile.

Evaluation length – cut-off

The traverse length (lt) is the total length of the probe motion during the scanning process. It must be greater than the evaluation length in order to be able to form the roughness profile

The sampling length (lr) is the digitization distance of the roughness profile with the profile filter. With the exception of Rt measurement during the scanning process. It must be greater than the digitization distance. The interaction between waviness and roughness is the cut-off between waviness and roughness.

Evaluation length – cut-off

The sampling length lr corresponds to the cut-off of five sampling lengths lr.

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