

Roughness measurement standards

line of product KNT 4070/03 (ultrafine roughness measurement profile)

according to Physikalisch-Technische Bundesanstalt (PTB)-measurement standards.

For calibrating and checking of the complete contact stylus instrument from the stylus to the measurement value display, as well as for calibrating and checking of optically sampling surface profilometer.

Nominal values of the ultra fine roughness measurement standards

Level	Article-No.	Ra in nm	Rz in nm
1	4070/03A1/...	25	150
2	4070/03A2/...	60	320
3	4070/03A3/...	80	450

Measuring results and measuring uncertainty

The following table shows as an example the measuring results of three roughness measurement standards. There are the mean values of 9 measurements with each standard. It was measured on the traces I to III of the line of products KNT 4070/03 in radial direction from outside to inside according to the metering point plan (see page 6.6).

It is important that the starting points of the total evaluation lengths are always slightly removed to the repetition of the profile, as also described for measurements with line of product KNT 4058/... [12].

	Ra U ¹⁾		Rz U ¹⁾		Rmax U ¹⁾		Rk U ²⁾		Rpk U ²⁾		Rvk U ²⁾		Mr1 U ³⁾		Mr2 U ³⁾	
Level	nm	%	nm	%	nm	%	nm	%	nm	%	nm	%	%	%	%	%
1	26	10	144	12	174	15	87	7	21	6	31	6	11	4	88	4
2	63	10	342	12	421	15	202	7	54	6	71	6	11	4	89	4
3	83	10	451	12	552	15	271	7	70	6	95	6	12	4	88	4

Annotations:

- 1) relative uncertainty referring to the measured value
- 2) relative uncertainty referring to Rz
- 3) relative uncertainty referring to 100 % material fraction

For further information, please see [1]

Calibration of optically sampling surface profilometers

It becomes more and more common to use interference microscopes with automatical image evaluation for surface measurements, as the measurements can be made contactless and fast. These measuring instruments also offer the calculation of all ISO parameters. It is, however, not always clear, if this evaluation is really made according to the normed measuring conditions. Comparative measurements with contact stylus instruments often give results that are little satisfactory. One reason for that is the distinctly smaller lateral resolution of the interference microscopes respectively a total evaluation length not conforming to norms.