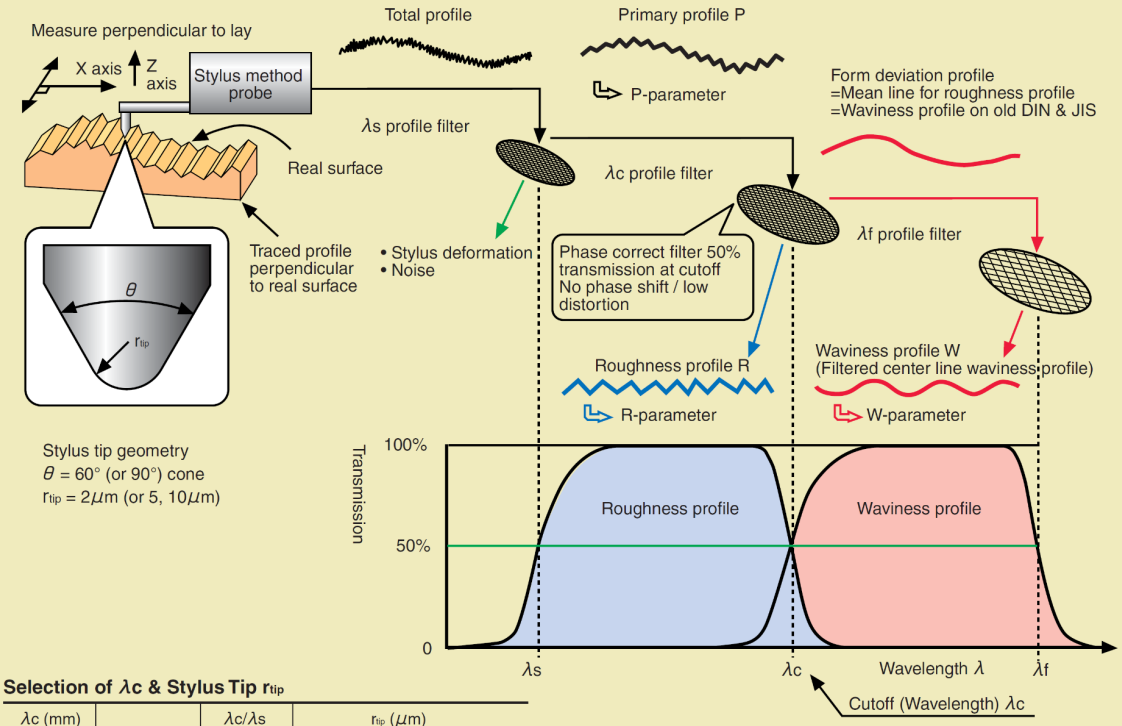
Definition of Surface texture and Stylus instrument

Profile by Stylus and phase correct filter

ISO4287: '97 and ISO3274: '96



Selection of λc & Stylus Tip r_{tip}

λc (mm)		λc/λs	r_{tip} (μm)
0.08	2.5	30	2
0.25		100	
0.8		300	2 (5 at RZ > 3μm)
2.5	8		5 or 2
8	25		10, 5 or 2

Evaluation procedure of roughness

ISO4288: '96

1. View the surface and decide whether profile is periodic or non-periodic.
2. When the tolerance limit is specified, use the table shown on the left for condition.
3. When the tolerance limit is not specified.
   - 3.1 Estimate roughness and measure it in corresponding condition in the table.
   - 3.2 Change condition according with above result and measure it again.
   - 3.3 Repeat "3.2" if the result does not reached the condition.
   - 3.4 When the result reaches the condition, it will be the final value. Check it in shorter sampling length at non-periodic and change it if it meets.
4. Compare the result toward tolerance limit in accordance with following rule,

Upper limit - the 16% rule (Default)

Measure on the most critical surface. If not more than 16% of all value based on sampling length are exceed the limit, surface is acceptable.
- The first value does not exceed 70% of the limit.
- The first three values do not exceed the limit.
- Not more than one of the first six value exceed the limit.
- Not more than two of the first twelve value exceed the limit.

or when $\mu+\sigma$ does not exceed the limit, the result is acceptable.

Lower limit - the 16% rule (shown as L)

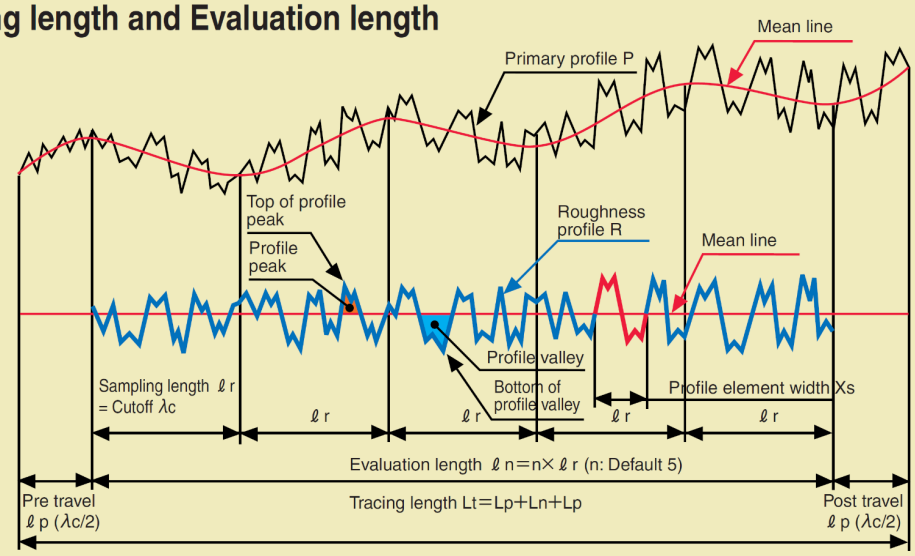
Measure the surface that can be expected the lowest roughness. If not more than 16% of all sampling length are less than the limit, or when $\mu-\sigma$ is not less than the limit, the result is acceptable.

Max value - the max rule (when "max" suffix is added)

The value is acceptable when none of value in entire surface is over the limit.

Sampling length and Evaluation length

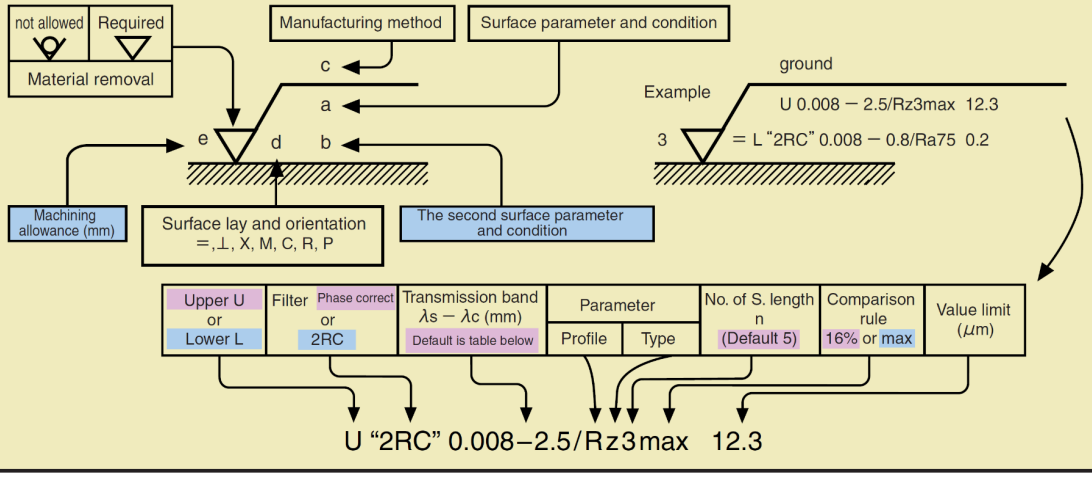
ISO4287: '97



Indication of surface texture

ISO 1302: '02

Note.:
Default item (red) is not indicated.
Additional item (blue) is indicated if necessary.



Measuring condition: R-parameter

ISO4288: '96

Non-periodic profile				Periodic profile or RSm		Measuring Condition	
Ra,Rq,Rsk,Rku or RΔq		Rz,Rv,Rp,Rc, or Rt				Sampling length: ℓr = CutOff λc (mm)	Evaluation length ℓn (mm) = 5 × ℓr
Ra (μm)		Rz (μm)		RSm (mm)			
Over>	Less≤	Over>	Less≤	Over>	Less≤		
0.006	0.02	0.025	0.1	0.013	0.04	0.08	0.4
0.02	0.1	0.1	0.5	0.04	0.13	0.25	1.25
0.1	2	0.5	10	0.13	0.4	0.8	4
2	10	10	50	0.4	1.3	2.5	12.5
10	80	50	200	1.3	4	8	40

Measuring condition : P-parameter

ISO4288: '96

Stylus radius	λs	λc	No. of ℓp = n	S. length ℓp	E. length ℓn
2μm	2.5μm	–	1	Length of feature (Plane, Line)	Length of feature
5μm	8μm				
10μm	25μm				

Measuring condition: W-parameter

ISO1302: '02

λc	λf	No. of ℓw = m	S. length ℓw	E. length ℓn
λc (for roughness)	nλc (n: specified)	m: specified	λf	mλf

Explanation of Surface Characteristics・Standards