

Burnishing

The Rotex Infinity actuators are machined to the best standards.

We talk often about Ra, but in the true sense, the Rp is more important to pneumatic components. In a case where Ra is low but Rp is high, standard operation will damage the seal faster than if the Ra is high and the Rp is low. We must understand what Ra and Rp are. Ra is an average roughness over the test length. Rp is an inverse of the distance at which Ra is repeating.

When you look at the diagram of the Ra and Rp, the Ra for both the cases are same, but it is obvious that better the Rp better the life.

Just to see what different manufacturers produce as the surface:

Make	Ra	Rp
A	2	8
B	8	12
C	11	15
Rotex	0.2	3

We can see clearly why Rotex will perform the best compared to other manufacturers.

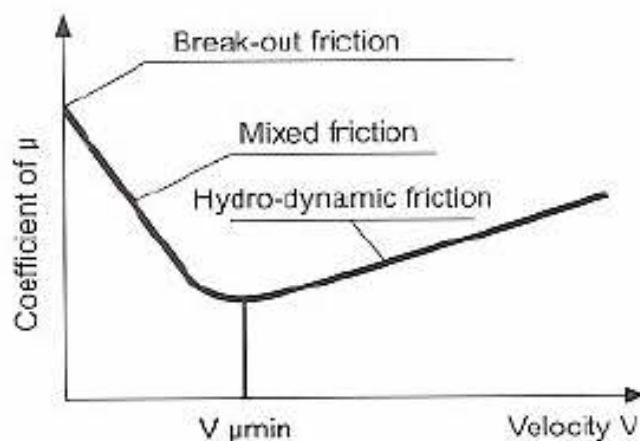


Fig. 6.17 Stribeck diagram

The Stribeck diagram above shows the friction behavior with rubber and metal. As soon as the pressure is applied to the piston the speed is low and the friction is very high. Then the lubrication gets between the seal and the body and the velocity increases and the friction keeps on reducing till the time velocity is not crossing the limits V_{\min} . beyond which the speed increase increases the friction.



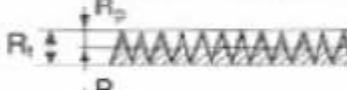
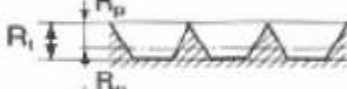


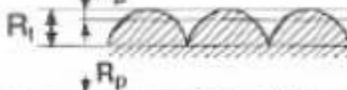
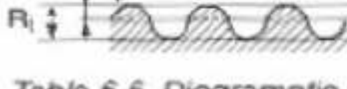
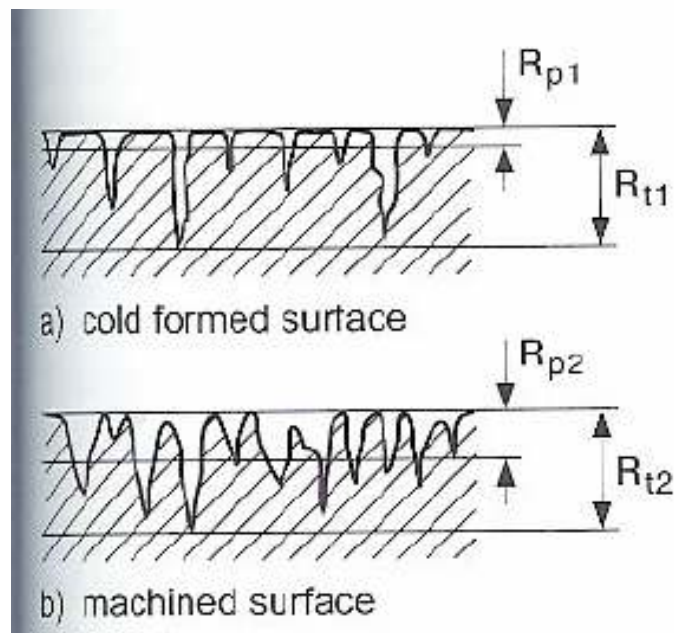
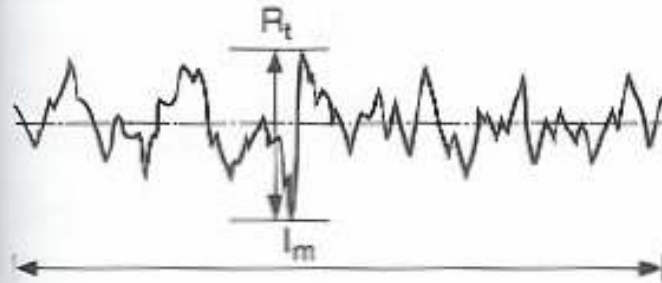
	R_t	R_p	R_a	t_p (%)		
	μm	μm	μm	0.25	0.50	$0.75 R_t$
	1	0.5	0.5	50	50	50
	1	0.5	0.25	25	50	75
	1	0.5	0.25	25	50	75
	1	0.75	0.28	12.5	25	37.5
	1	0.25	0.28	62.5	75	87.5
	1	0.785	0.188	3.5	14	35
	1	0.215	0.188	65	86	96.5
	1	0.5	0.39	43	50	57

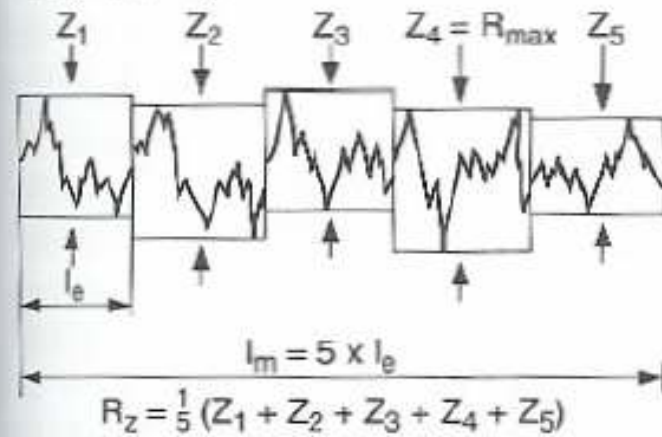
Table 6.6 Diagrammatic representation of surface profiles



R_t = vertical distance between highest and lowest point



R_{max} and R_z



R_p = depth of roughness

R_a = middle roughness value

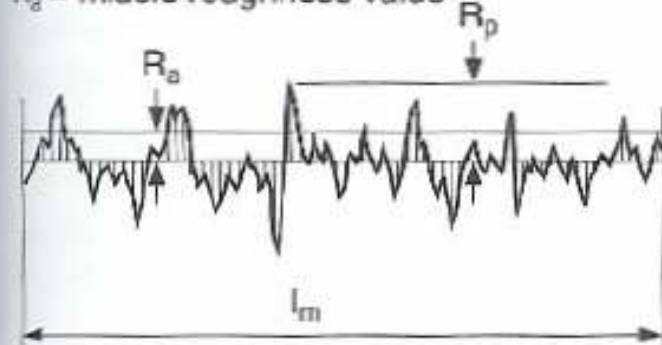
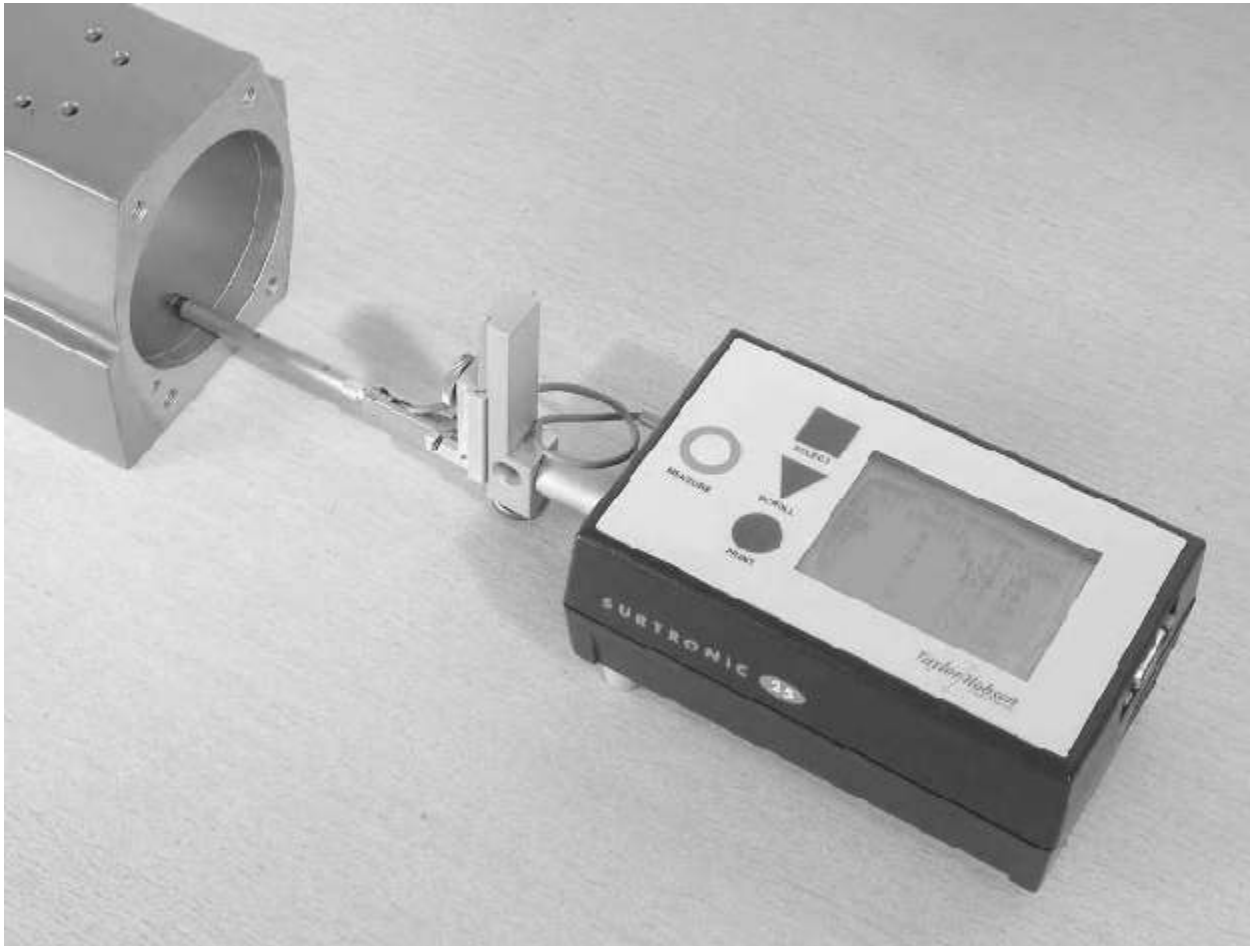


Fig. 6.14 Roughness terminology



Each and every Rotex actuator is tested to ensure that the burnishing meets our high standards.