

Technical data HOMMEL-ETAMIC nanoscan 855

Scanning system

Measuring range	24 mm (48 mm with double length probe arm)
Resolution	0.6 nm (1.2 nm with double length probe arm)
Measurement force	±1 mN to ±50 mN, programmable
Scanning direction	Z+ / Z-, programmable
Stylus tip protection	Electronic limiting of the lowering speed
Positioning accuracy stylus tip in Z	± 25 µm

Probe arm

Probe arm length (standard)	90 mm
Stylus tip	Diamond tip 2 µm/60°; ruby sphere Ø 1 mm
Probe arm holder	Magnetic with collision protection
Probe arm detection	Electronic, RFID

Traverse unit

Measuring range (scan distance)	200 mm
Resolution	10 nm to 10 µm
Measurement speed	0.1 – 3 mm/sec.
Positioning speed	Max. 9 mm/sec.
Straightness guide	≤ 0.4 µm / 200 mm

Measuring column

Travel	550 mm
Autozero function	In Z+ / Z-, programmable
Traverse speed	0.1 – 50 mm/sec.
Repetitive accuracy of positioning	≤10 µm

Measuring station

Granite plate (L x W x H)	850 x 600 x 140 mm
Damping	Active level regulation with damping function
Equipment table (L x W x H)	1190 x 800 x 780 mm
Work table (L x W x H)	810 x 800 x 780 mm
Cover	Optional

Measuring accuracy¹⁾

Angle measurement	± 0.5'	angle standard, nominal 90°
Radius measurement	± 0.01%	calibration sphere, nominal R = 10 mm
Distance measurement	± 2 µm	KN8, nominal 82 mm

1) Ambient temperature 20° ±1°, tension-free and insulated from low-frequency floor vibrations

Figure S1. Technical data of Nanoscan 855

The ample codification represents as follows:

- first digit, the blasting material and blasting conditions, second digit, blasting time in seconds, e.g.: sample 5-20 is blasted Ti, 5-20 – blasted with white electrocorundum F90, granulation 0.15-0.20 mm – normal flow for 20 seconds;

The blasting times were 10, 20, 60 seconds and the coding for blasting material and blasting conditions are as follows:

1. White electrocorundum F90 of grain size 0.15-0.20 mm mixed with sintered hydroxyapatite with a grain size $\leq 63 \mu\text{m}$, in a ratio of 3:1. – normal flow
2. White electrocorundum F90 of grain size 0.15-0.20 mm mixed with sintered hydroxyapatite with a grain size $\leq 63 \mu\text{m}$, in a ratio of 3:1. - half flow
3. Fine white electrocorundum of granulation 0.10 -0.15 mm mixed with sintered hydroxyapatite with a granulation $\leq 63 \mu\text{m}$, in a ratio of 3:1 – normal flow.
4. Fine white electrocorundum of granulation 0.10-0.15 mm mixed with sintered hydroxyapatite with a granulation $\leq 63 \mu\text{m}$, in a ratio of 3:1 – half flow
5. White electrocorundum F90 granulation 0.15-0.20 mm – normal flow
6. White electrocorundum F90 granulation 0.15-0.20 mm - half flow
7. Fine white electrocorundum of 0.10-0.15 mm granulation – normal flow
8. Fine white electrocorundum of 0.10-0.15 mm granulation - half flow rate
9. Glass balls for sandblasting 0.04-0.07 mm - normal flow
10. Glass balls for sandblasting 0.04-0.07 mm - half flow
11. Olivine - grain size 0-0.5mm - normal flow
12. Olivine- granulation 0-0.5mm - half flow
13. Red garnet - grain size 0.40 – 0.80 mm – normal flow
14. Red garnet - grain size 0.40 – 0.80 mm – half flow
15. Brown electrocorundum - granulation 0.120 – 0.212 mm – normal flow
16. Brown electrocorundum - grain size 0.120 – 0.212 mm – half flow rate

Results obtained from roughness evaluations Figures S2–S99 show the roughness profiles and the values related to the roughness parameters.

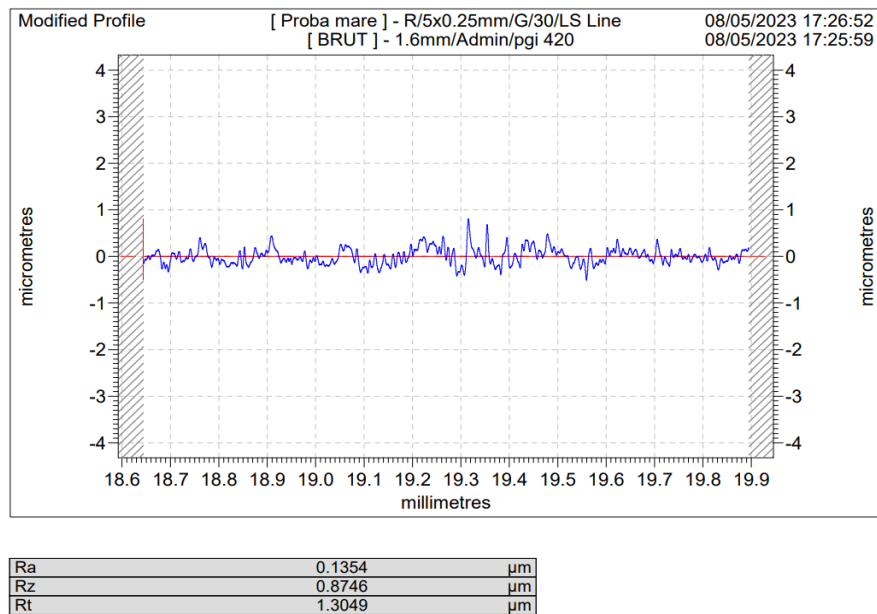


Figure S2. - Unblasted Ti4Al6V

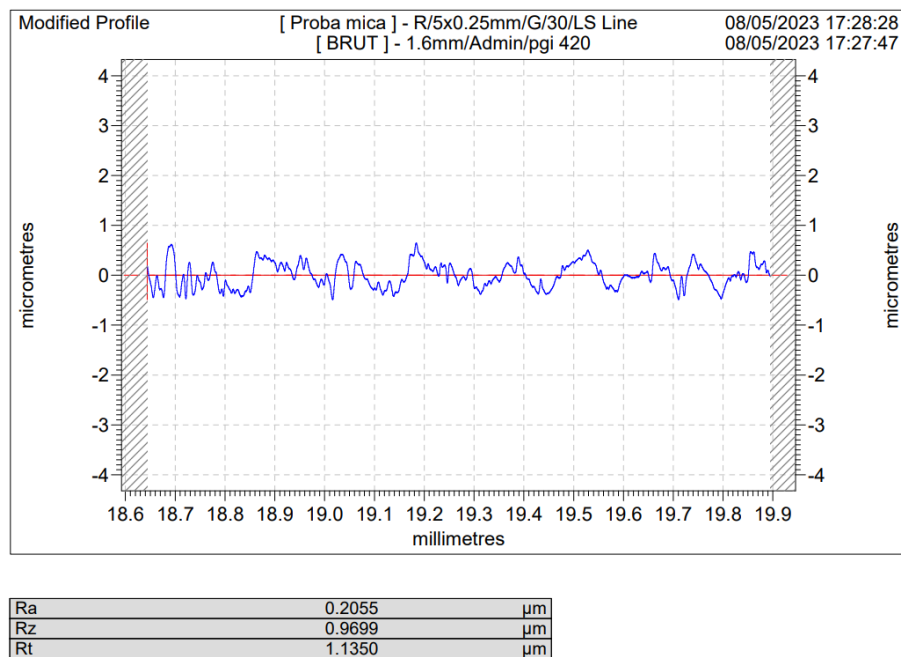
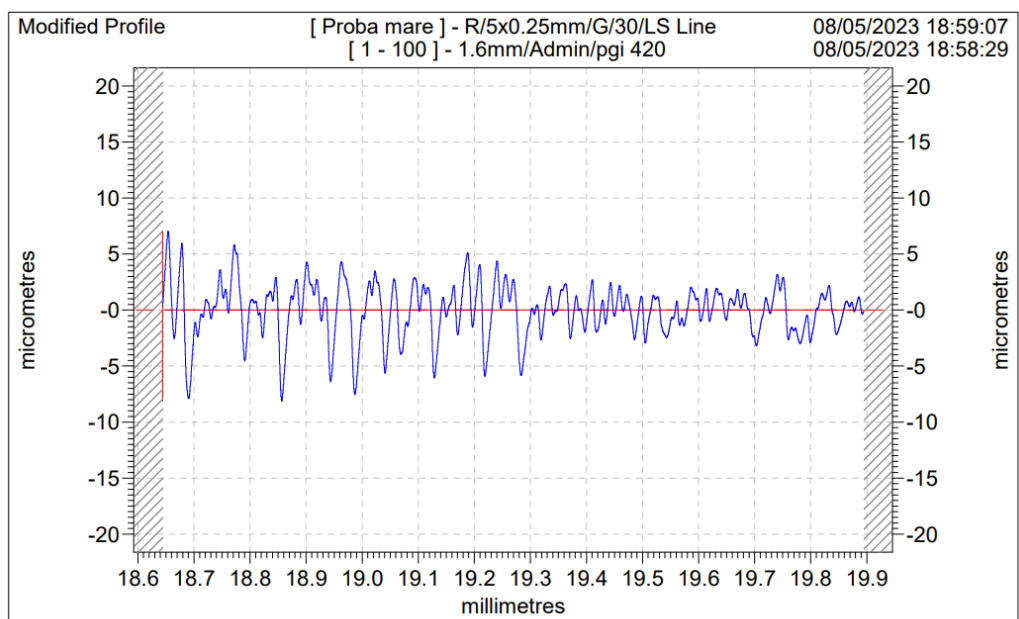
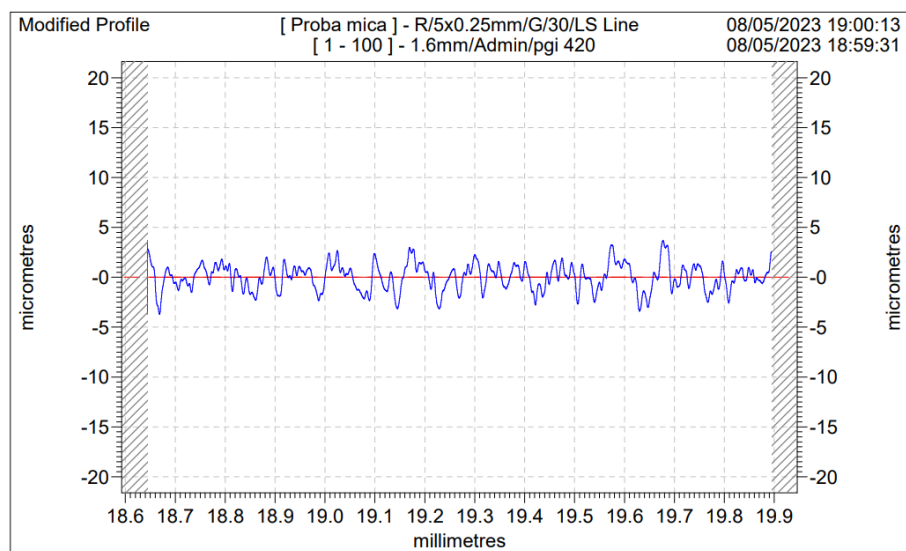


Figure S3. Unblasted Ti



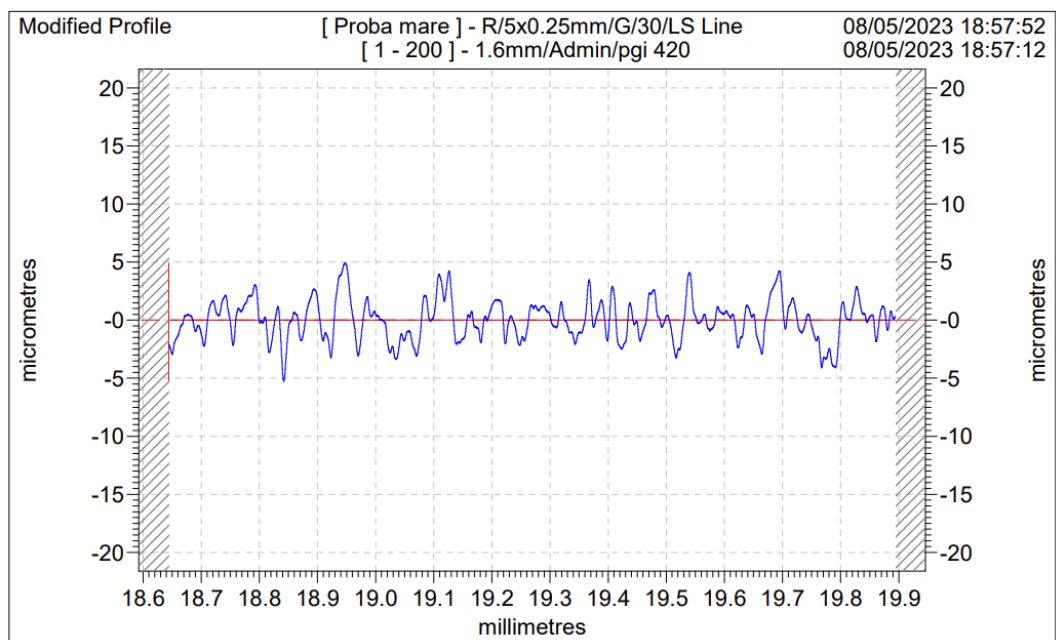
Ra	1.7703	µm
Rz	9.9797	µm
Rt	15.1415	µm

Figure S4. Sample 1-10 Ti4Al6V (blasted 10 s)



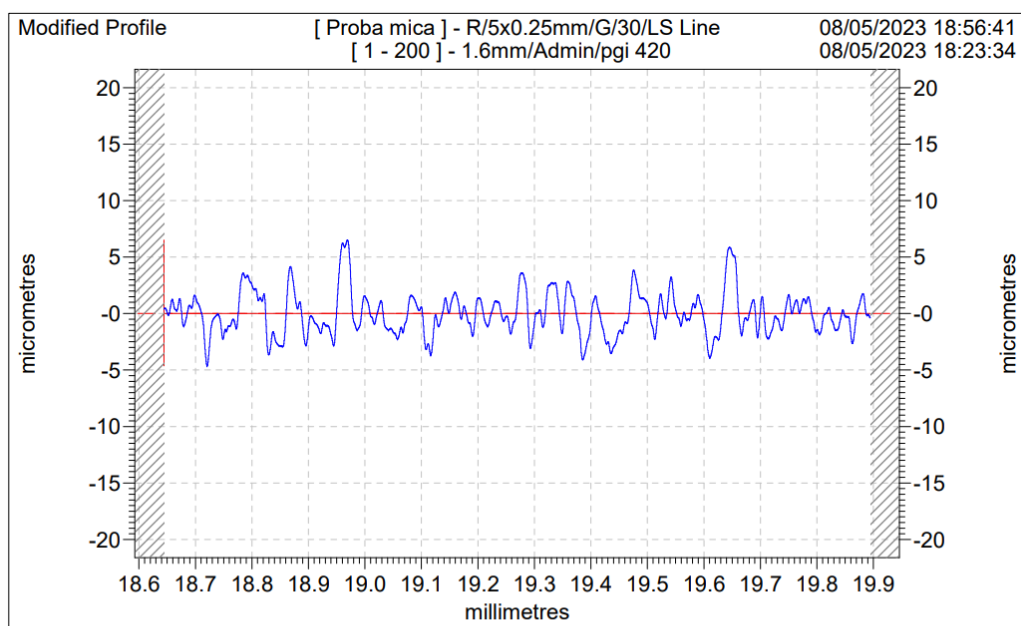
Ra	1.0704	µm
Rz	6.3626	µm
Rt	7.3997	µm

Figure S5. Sample 1-10 Ti (blasted 10 s)



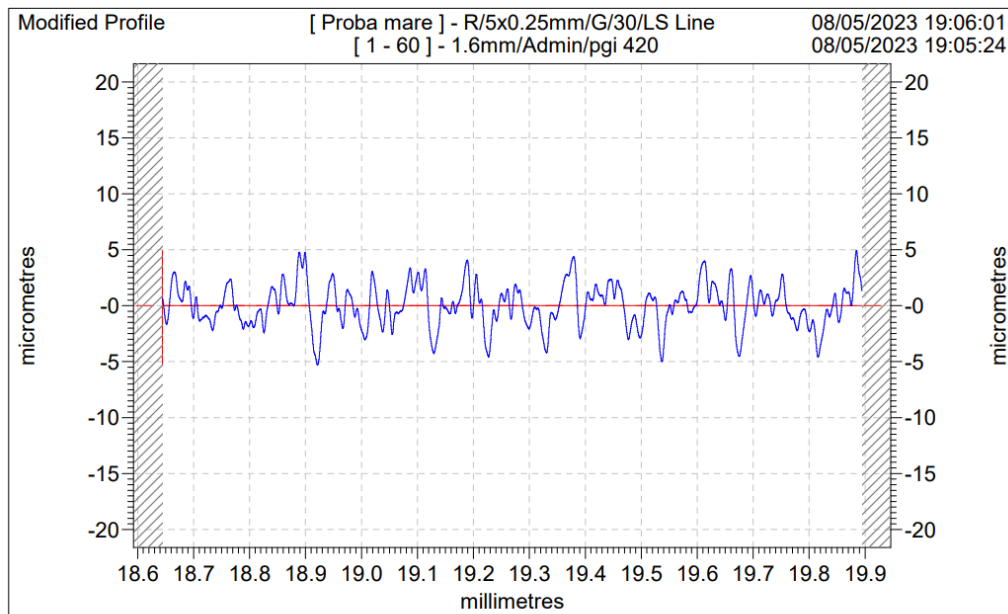
Ra	1.3463	µm
Rz	7.5715	µm
Rt	10.1503	µm

Figure S6. 1-20 Ti4Al6V



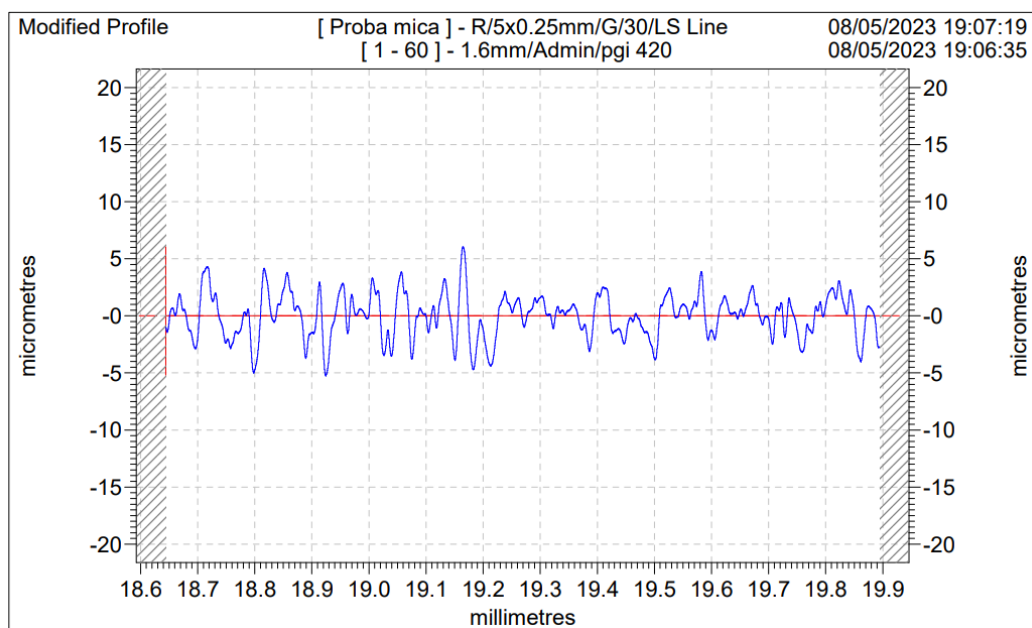
Ra	1.4513	µm
Rz	8.9856	µm
Rt	11.1339	µm

Figure S7. 1-20 Ti



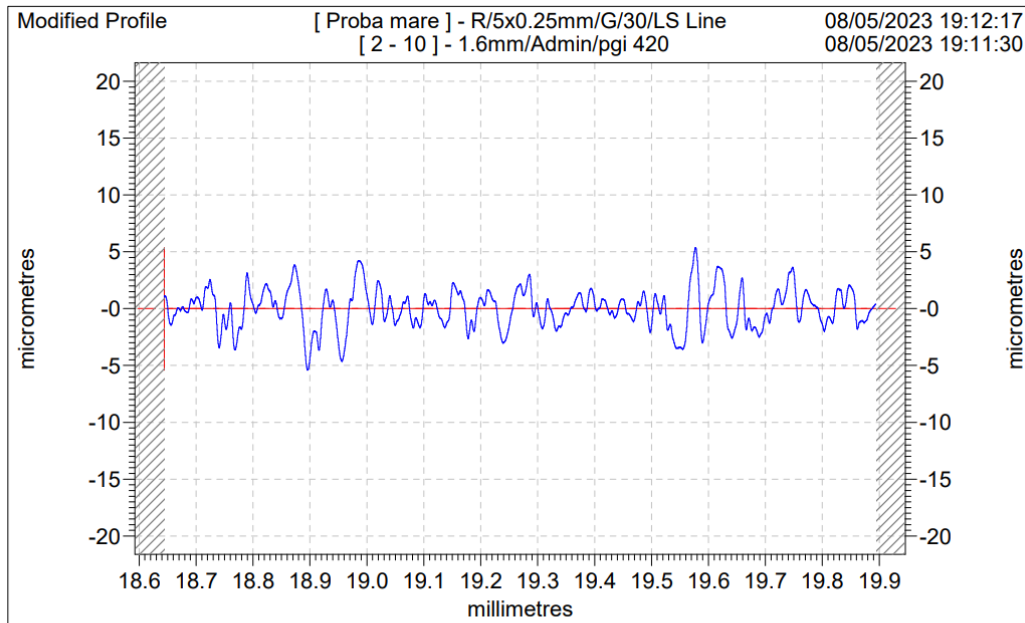
Ra	1.5043	µm
Rz	8.9174	µm
Rt	10.2044	µm

Figure S8. 1-60 Ti4Al6V



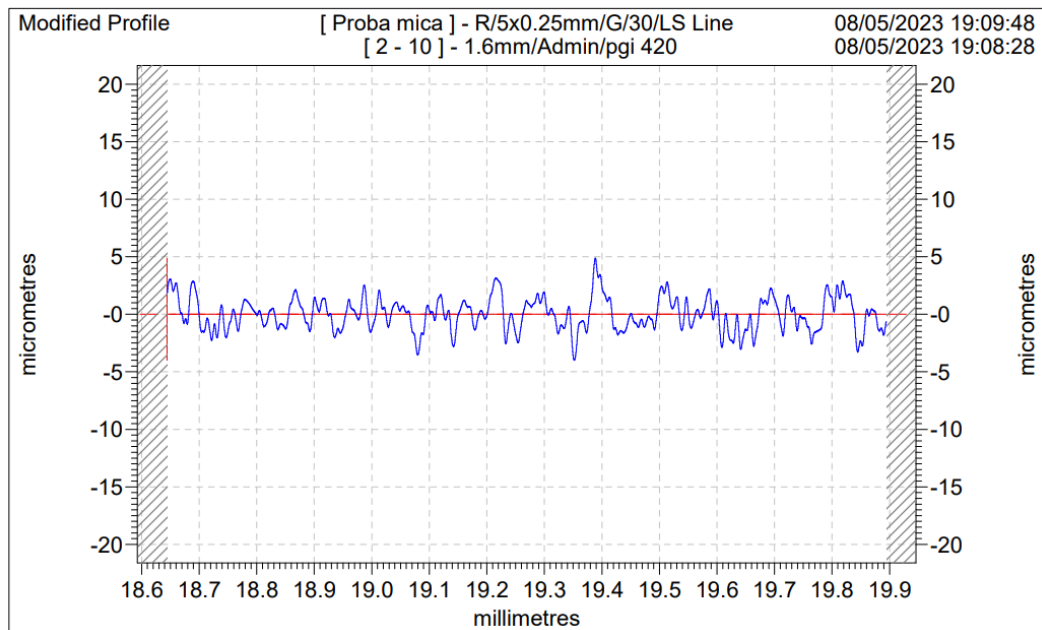
Ra	1.4993	µm
Rz	8.7541	µm
Rt	11.2481	µm

Figure S9. 1-60 de Ti



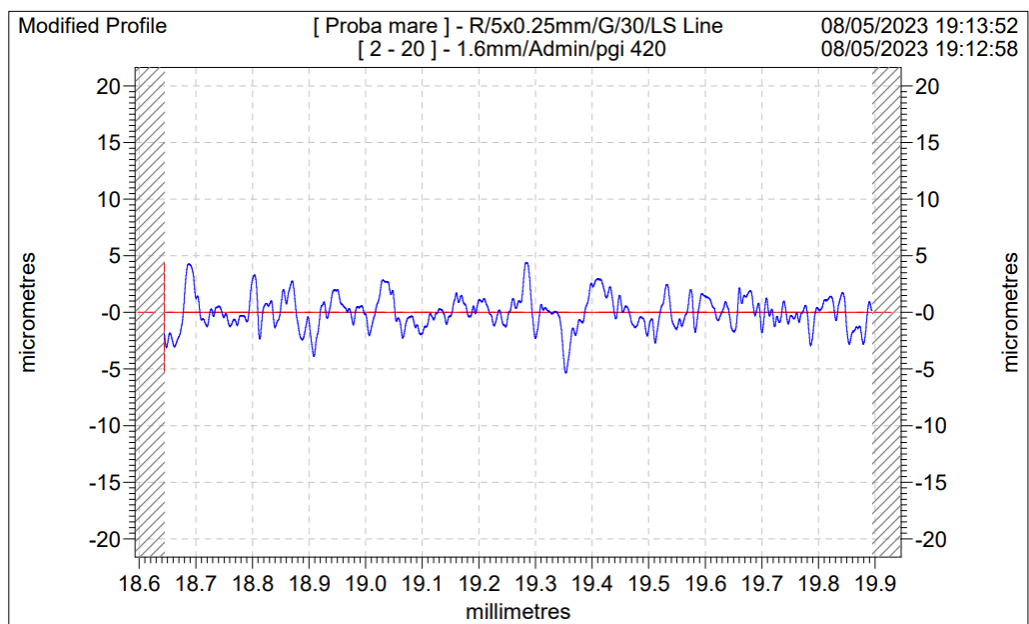
Ra	1.3472	µm
Rz	7.9265	µm
Rt	10.7689	µm

Figure S10. 2-10 Ti4Al6V



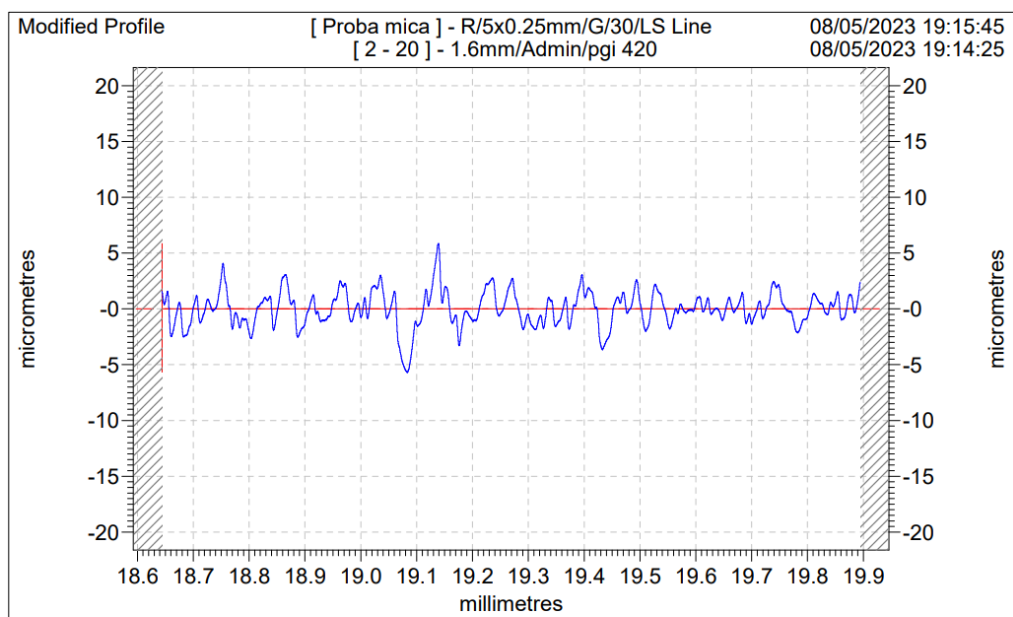
Ra	1.1449	µm
Rz	6.5609	µm
Rt	8.8654	µm

Figure S11. 2-10 Ti



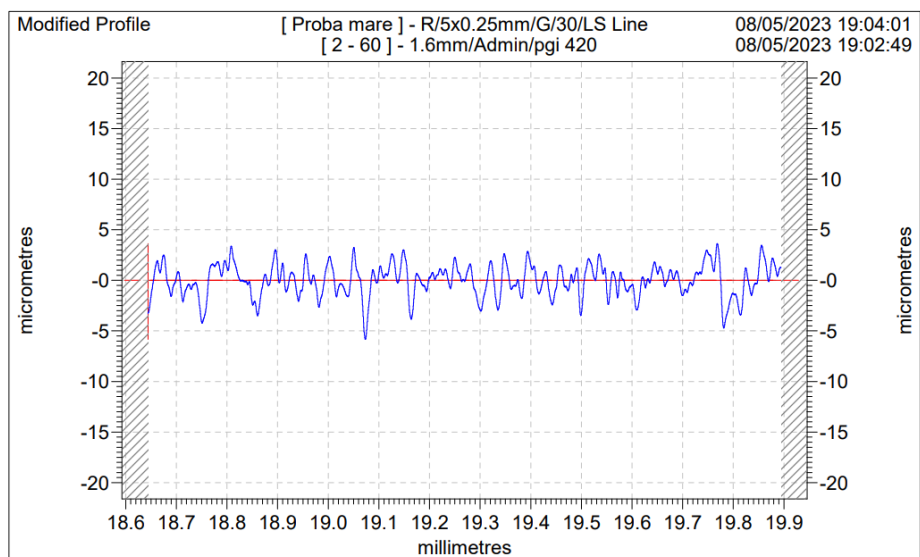
Ra	1.1422	µm
Rz	6.9108	µm
Rt	9.7784	µm

Figure S12. 2-20 Ti4Al6V



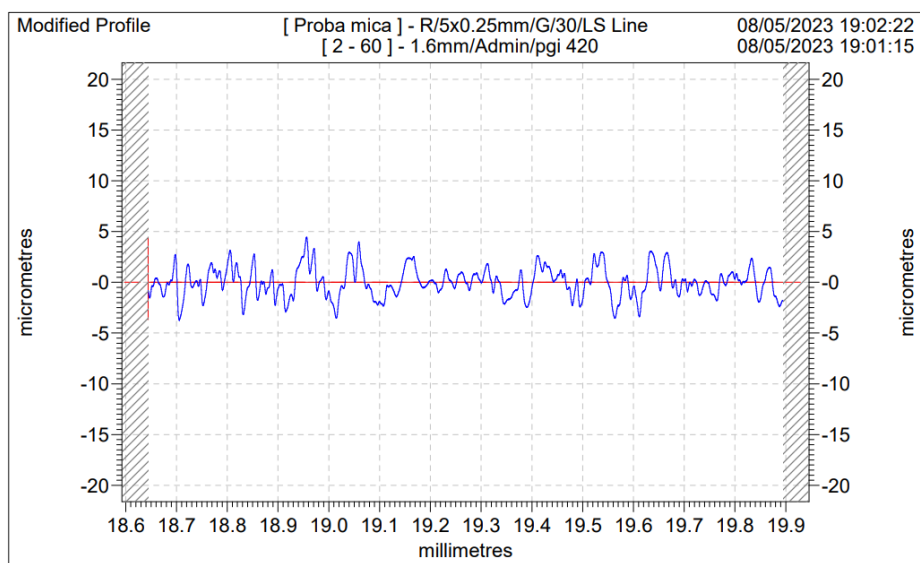
Ra	1.1645	µm
Rz	7.1129	µm
Rt	11.5305	µm

Figure S13. 2-20 Ti



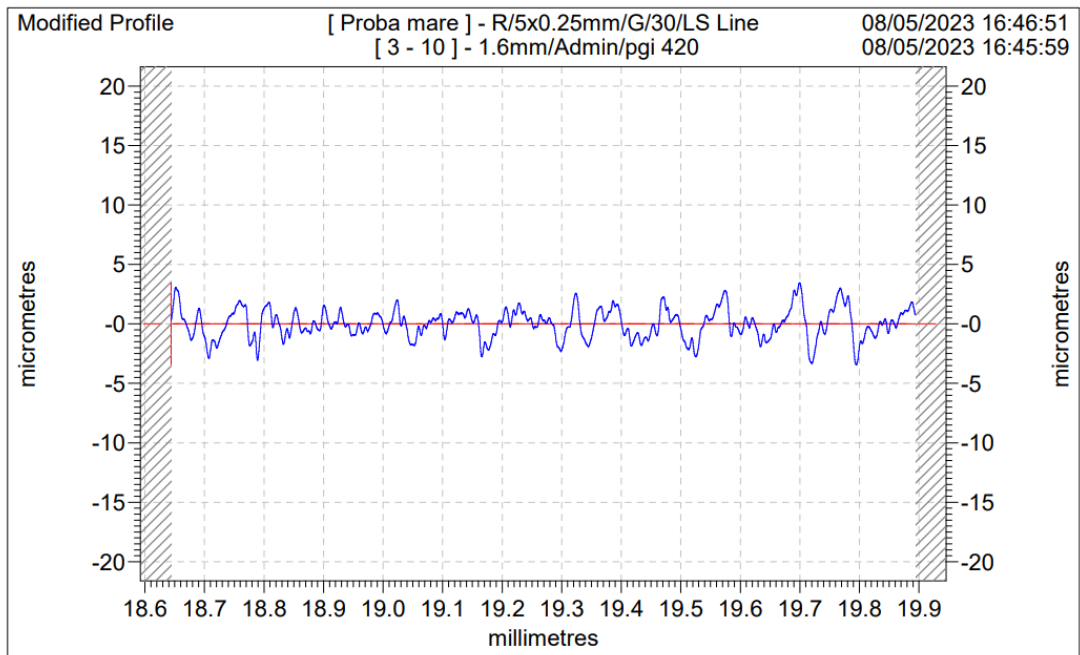
Ra	1.2295	µm
Rz	7.6218	µm
Rt	9.4589	µm

Figure S14. 2-60 Ti4Al6V



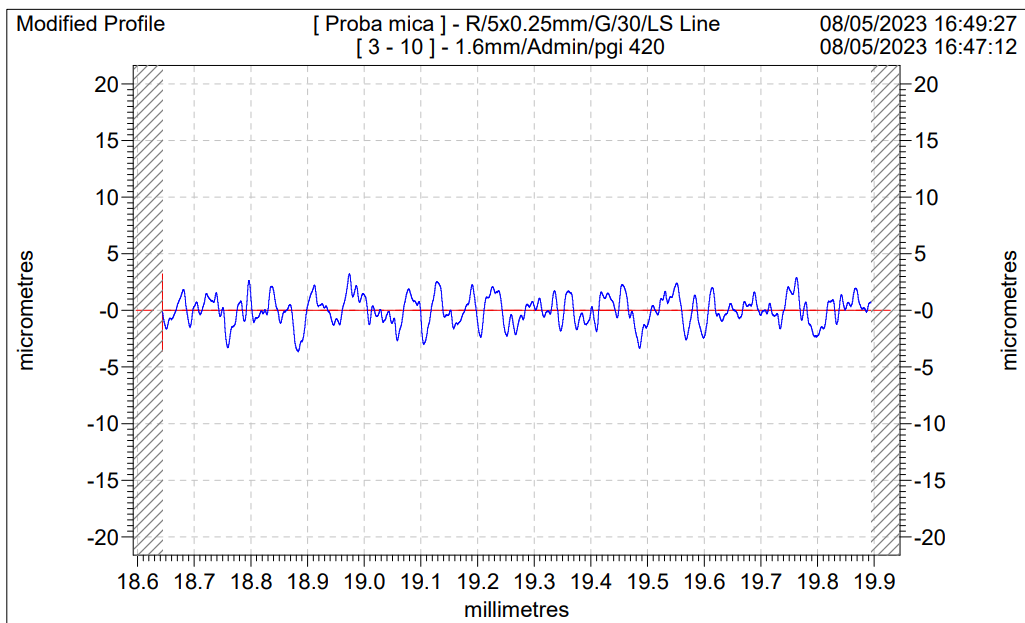
Ra	1.1385	µm
Rz	6.3370	µm
Rt	8.1182	µm

Figure S15. 2-60 Ti



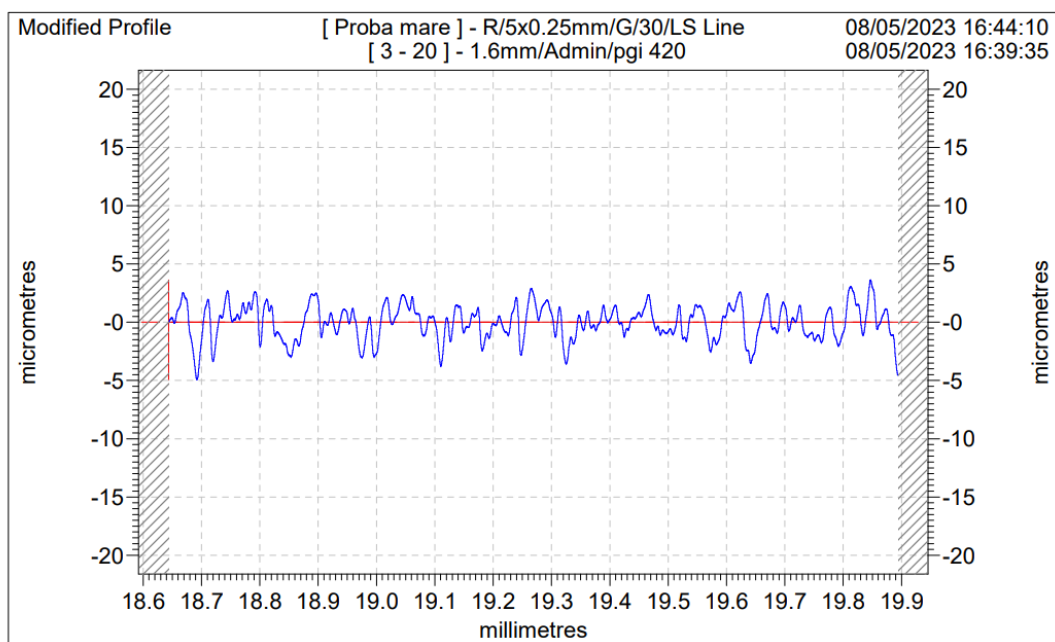
Ra	0.9809	µm
Rz	5.5383	µm
Rt	6.8909	µm

Figure S16. 3-10 Ti4Al6V



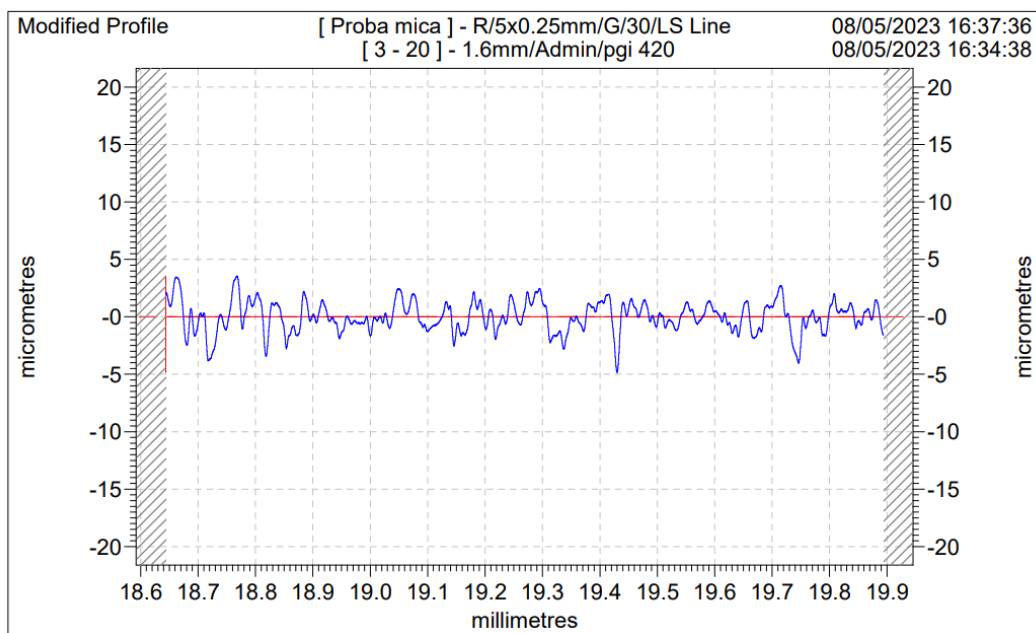
Ra	1.0121	µm
Rz	5.5750	µm
Rt	6.8216	µm

Figure S17. 3-10 de Ti



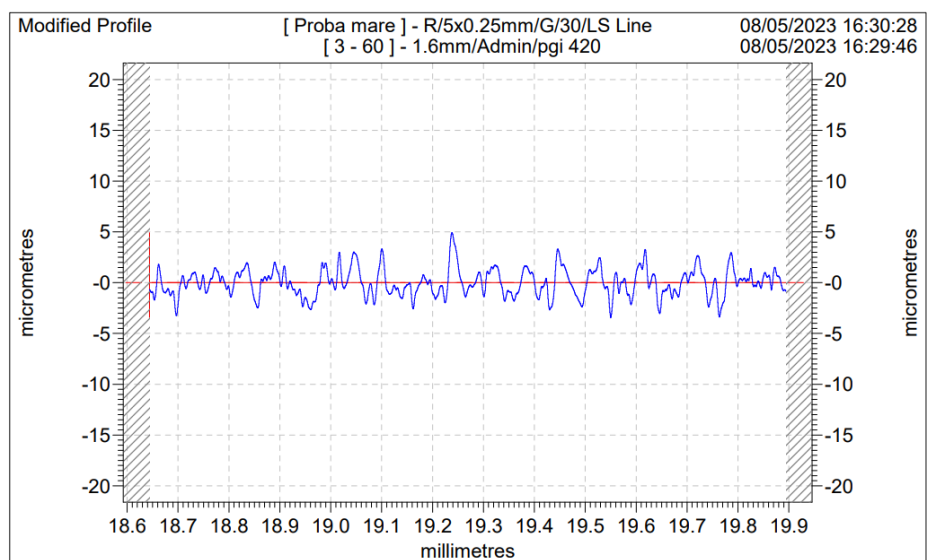
Ra	1.1930	µm
Rz	6.9284	µm
Rt	8.5575	µm

Figure S18. 3-20 Ti4Al6V



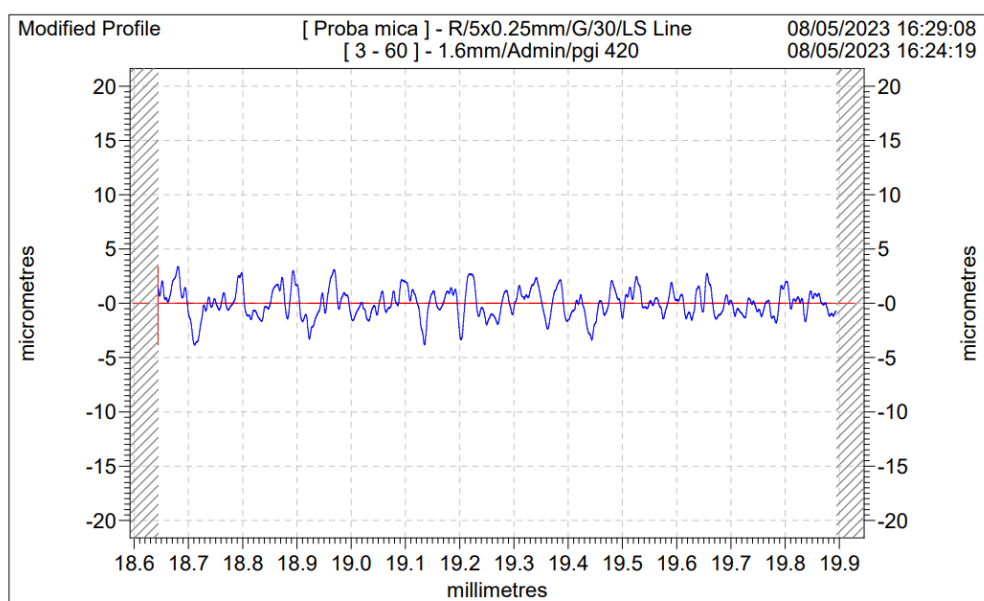
Ra	1.0399	µm
Rz	6.0806	µm
Rt	8.3814	µm

Figure S19. 3-20 Ti



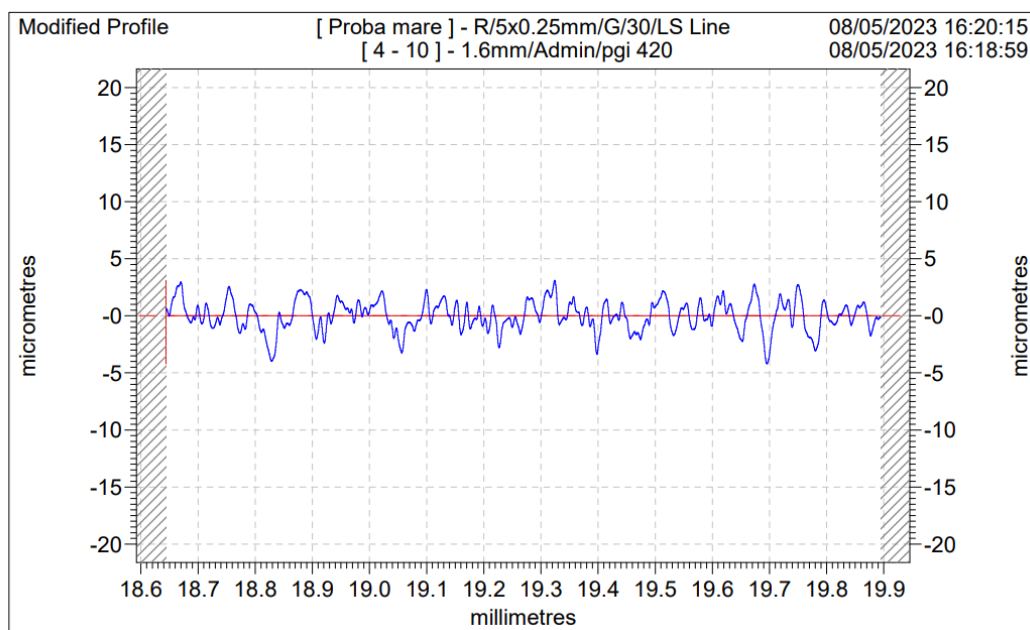
Ra	1.0652	µm
Rz	6.3550	µm
Rt	8.3285	µm

Figure S20. 3-60 Ti4Al6V



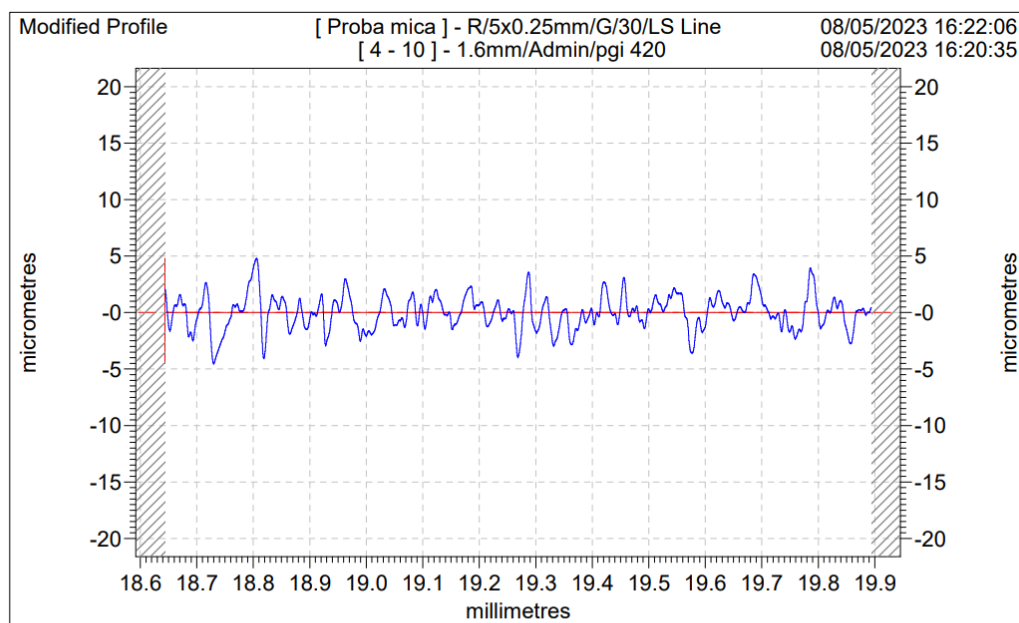
Ra	1.0389	µm
Rz	6.1092	µm
Rt	7.2141	µm

Figure S21. 3-60 Ti



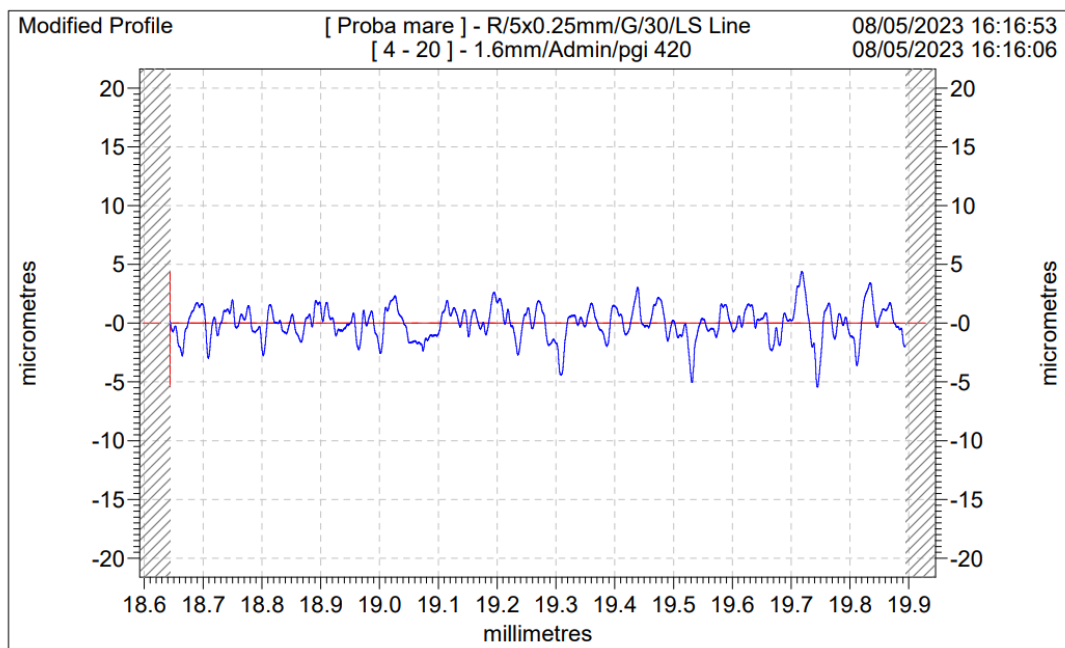
Ra	1.0480	µm
Rz	6.1586	µm
Rt	7.2948	µm

Figure S22. 4-10 Ti4Al6V



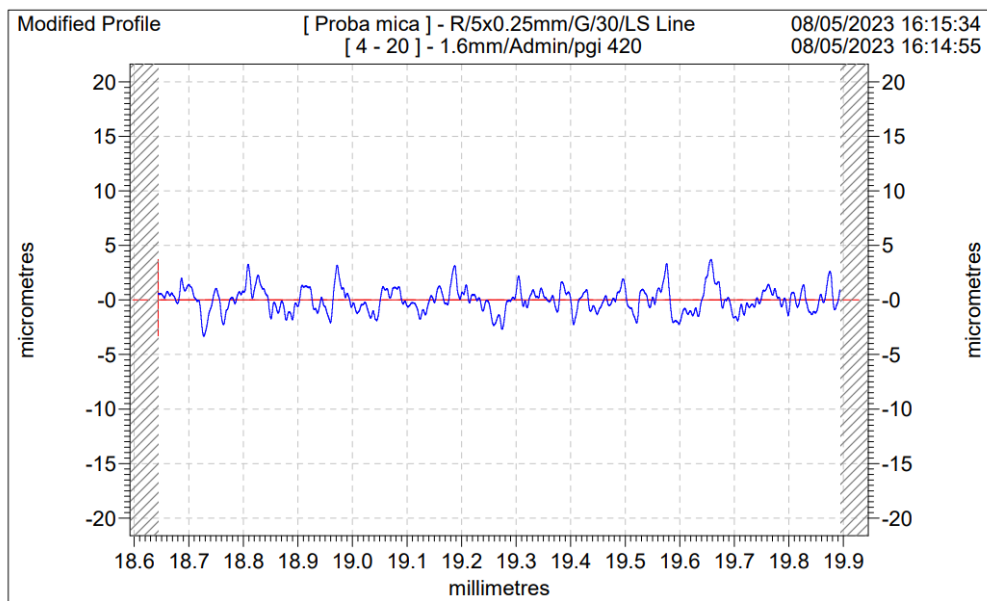
Ra	1.1670	µm
Rz	7.2131	µm
Rt	9.2945	µm

Figure S23. 4-10 Ti



Ra	1.0733	µm
Rz	6.9458	µm
Rt	9.8327	µm

Figure S24. 4-20 Ti4Al6V



Ra	0.8941	µm
Rz	5.7470	µm
Rt	7.0102	µm

Figure S25. 4-20 Ti

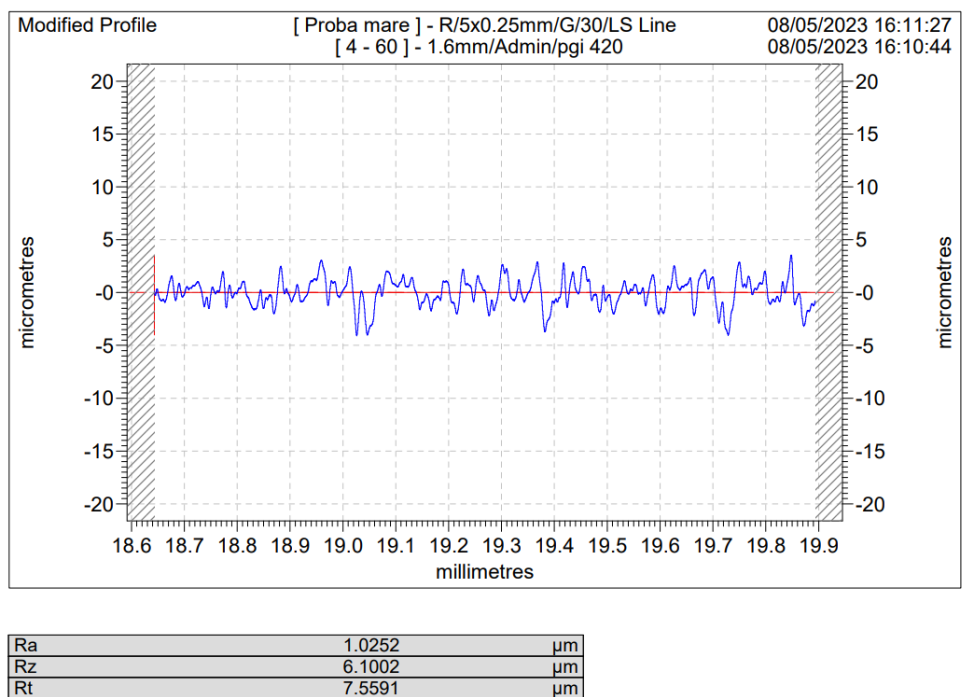


Figure S26. 4-60 Ti4Al6V

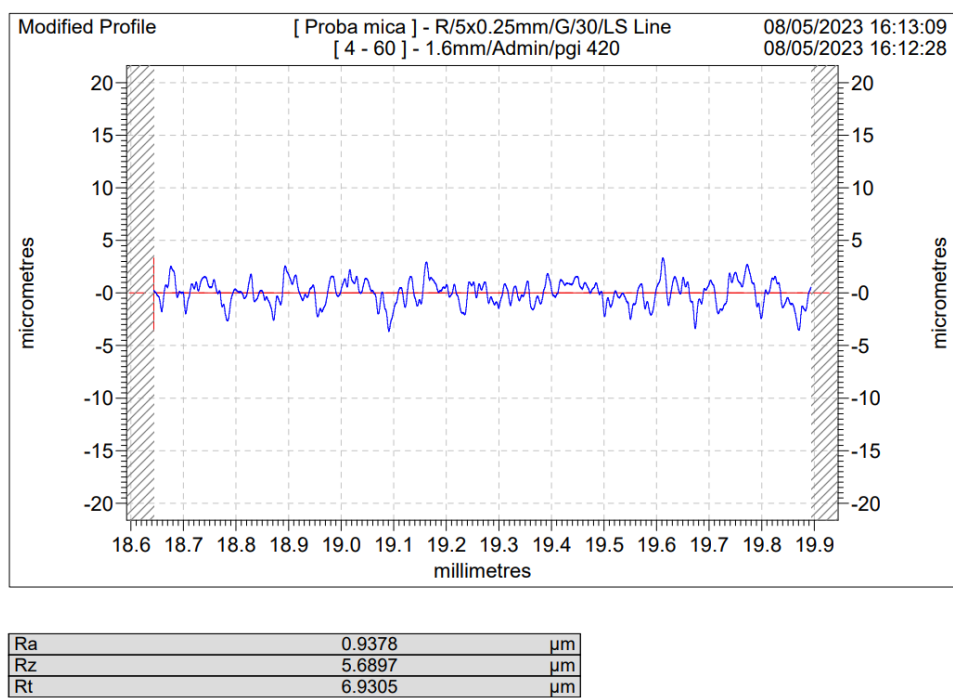
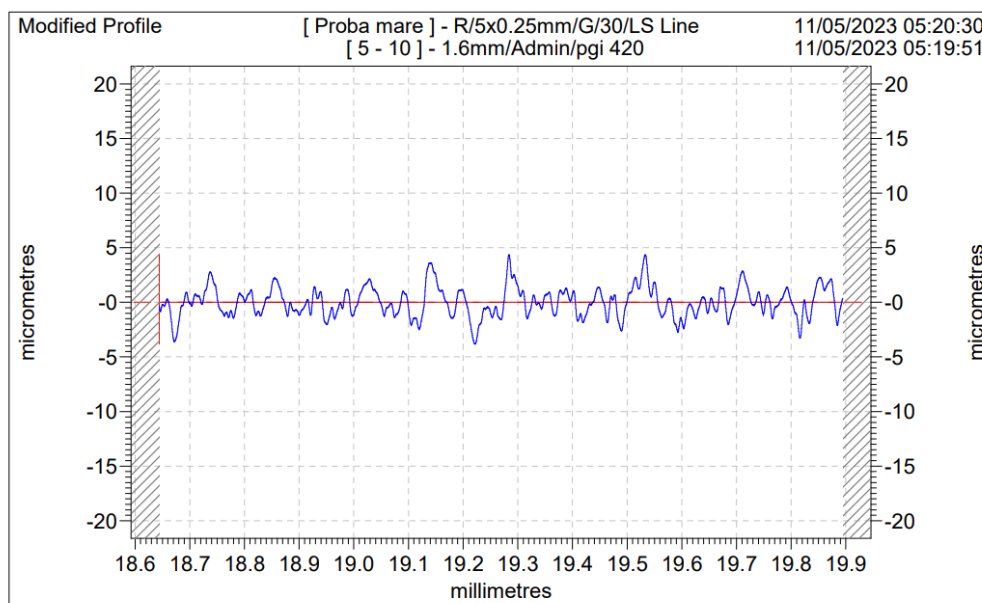
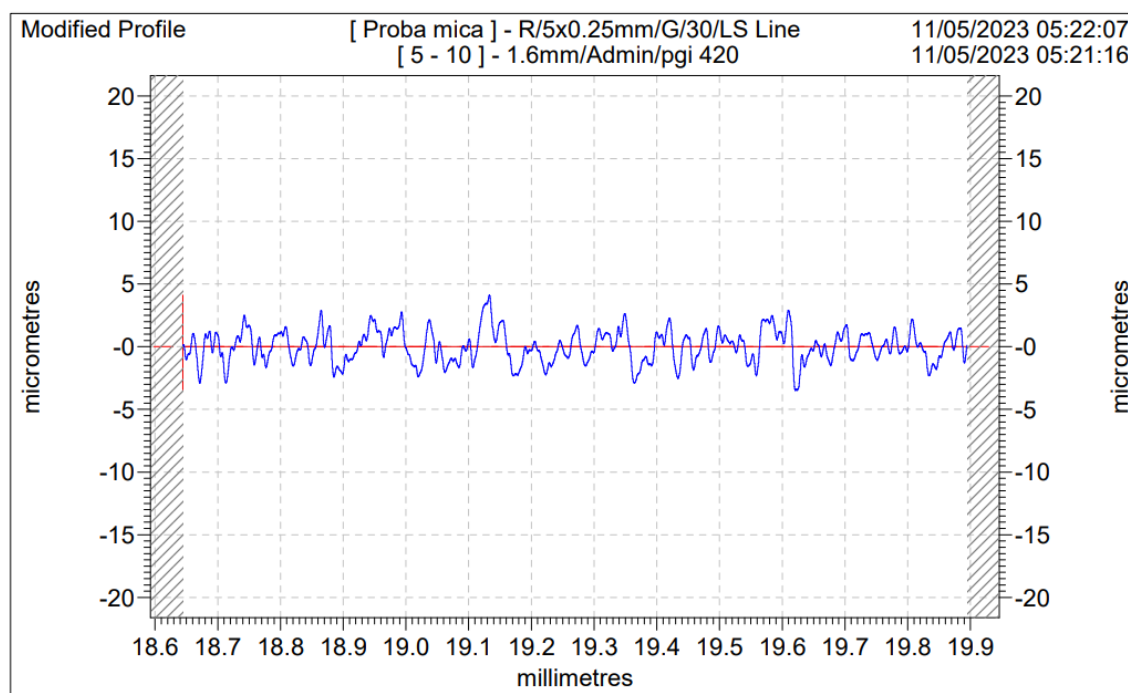


Figure S27. 4-60 Ti



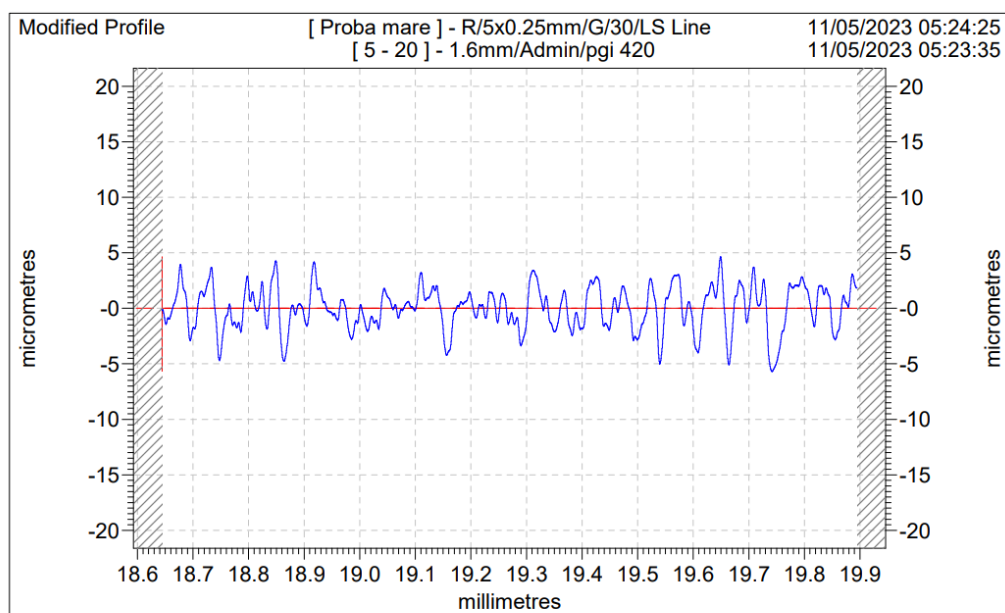
Ra	1.0746	µm
Rz	6.7621	µm
Rt	8.1742	µm

Figure S28. 5-10 Ti4Al6V



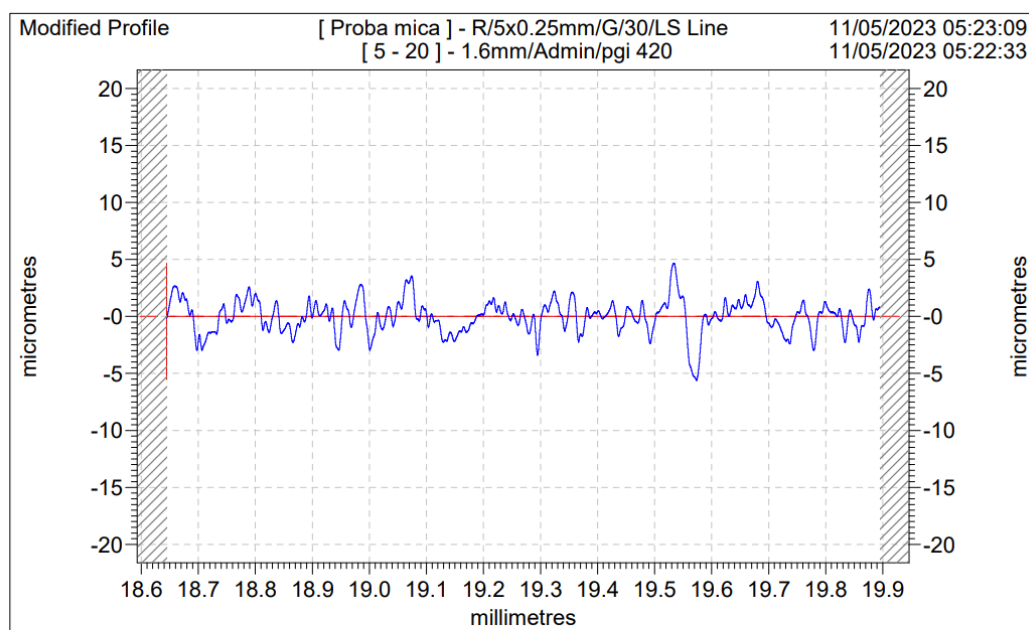
Ra	1.0504	µm
Rz	5.7366	µm
Rt	7.5677	µm

Figure S29. 5-10 Ti



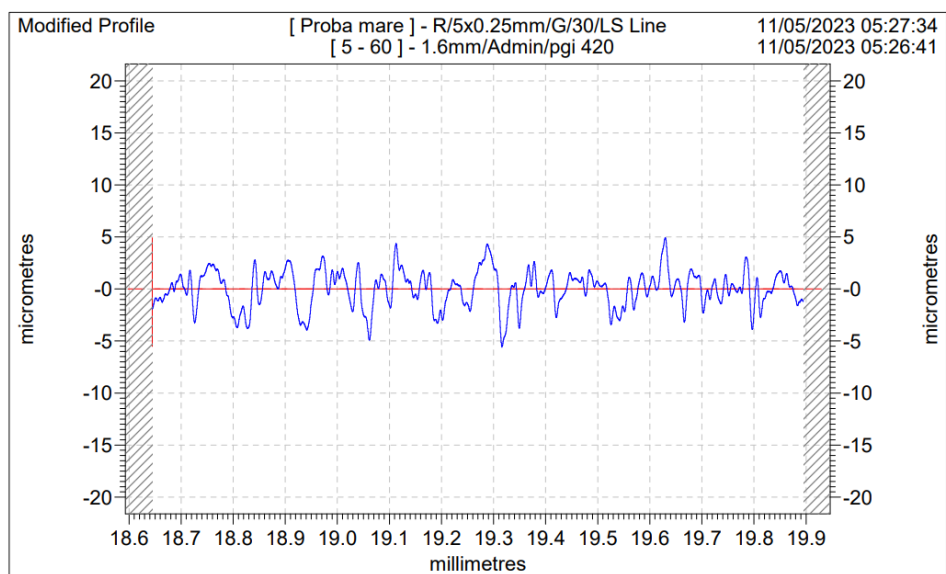
Ra	1.5539	µm
Rz	8.3761	µm
Rt	10.3135	µm

Figure S30. 5-20 de Ti4Al6V



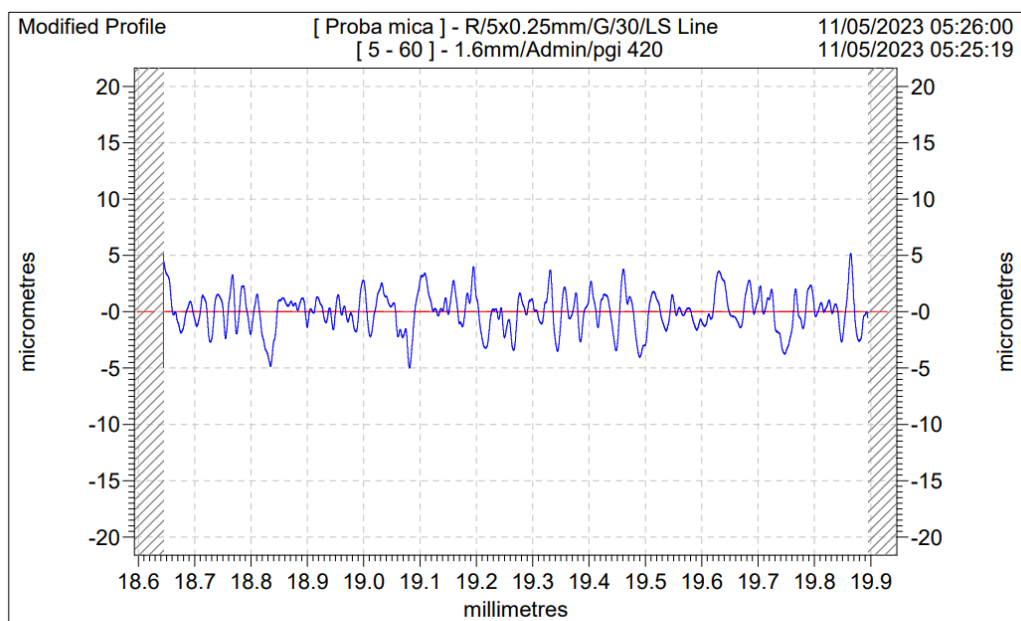
Ra	1.1124	µm
Rz	6.7864	µm
Rt	10.2255	µm

Figure S31. 5-20 de Ti



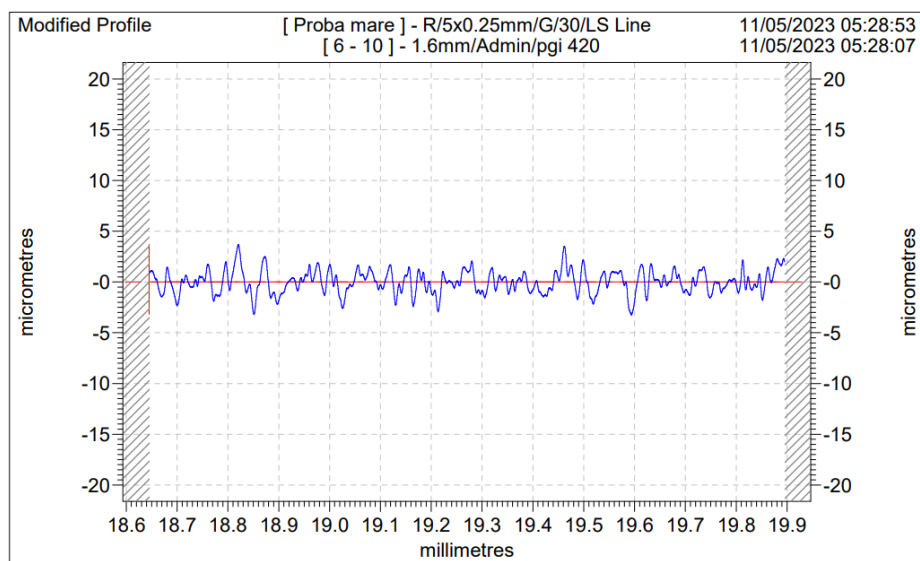
Ra	1.4036	µm
Rz	8.2004	µm
Rt	10.4499	µm

Figure S32. 5-60 Ti4Al6V



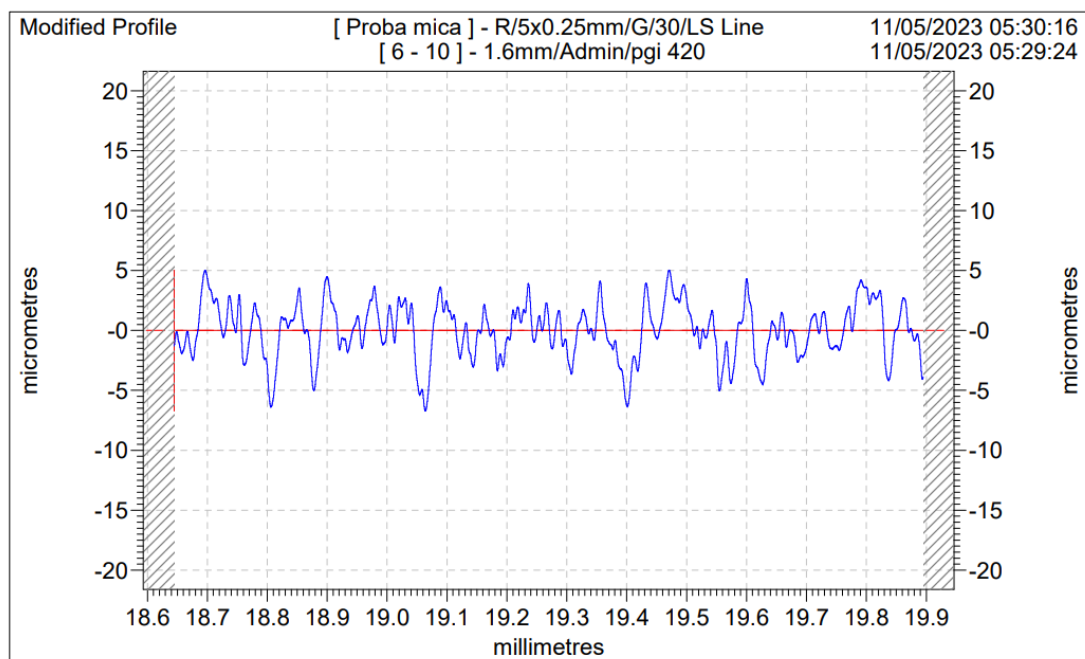
Ra	1.3237	µm
Rz	8.3718	µm
Rt	10.1273	µm

Figure S33. 5-60 Ti



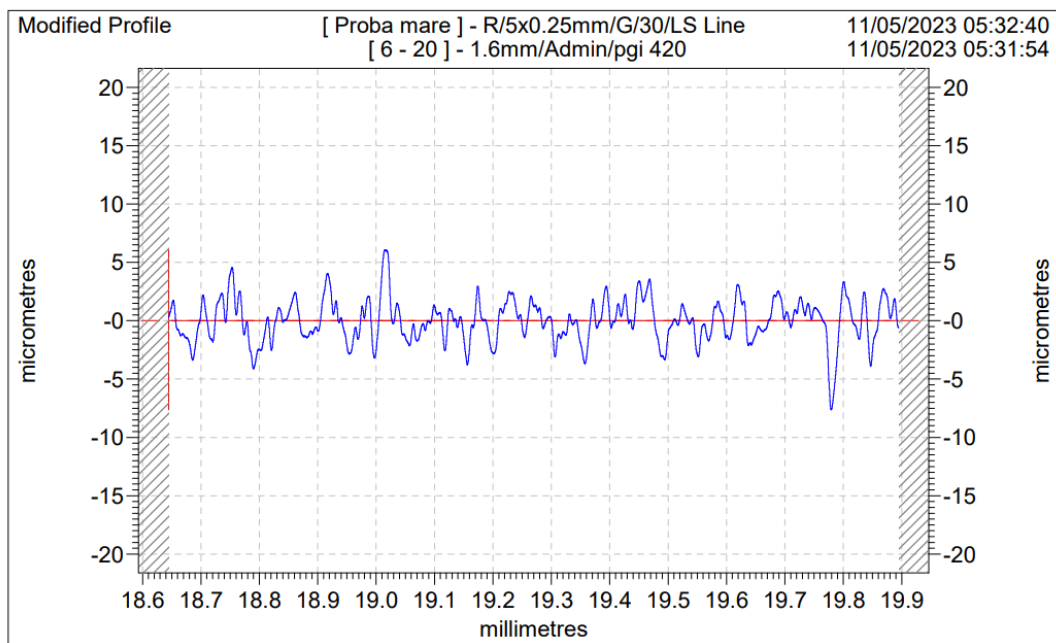
Ra	0.8885	µm
Rz	5.4167	µm
Rt	6.8860	µm

Figure S34. 6-10 Ti4Al6V



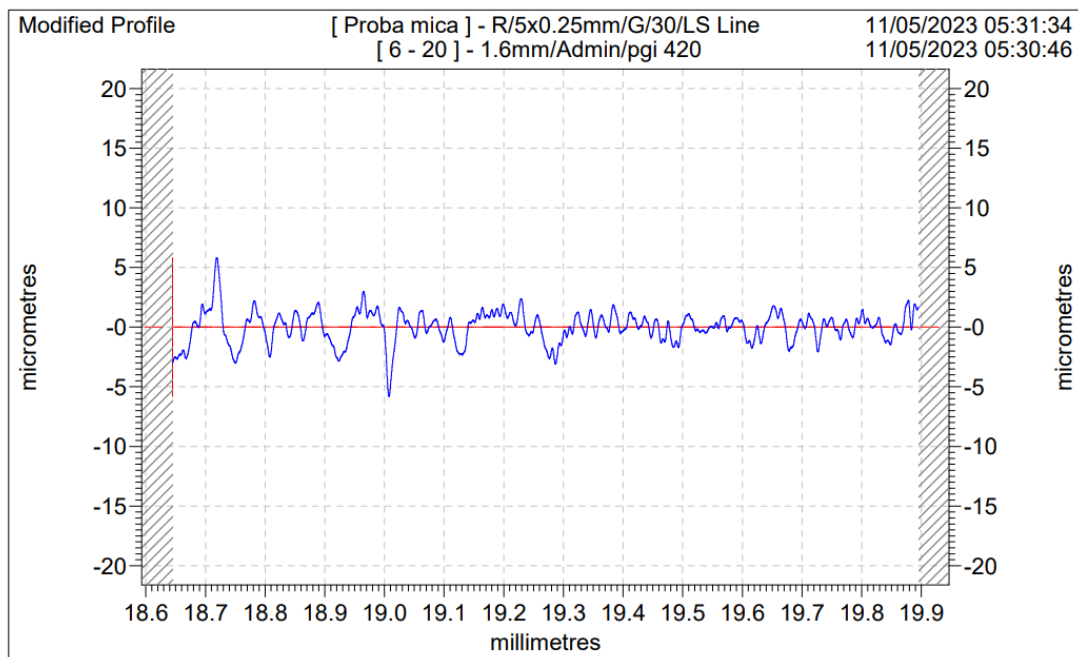
Ra	1.8142	µm
Rz	10.1332	µm
Rt	11.7461	µm

Figure S35. 6-10 Ti



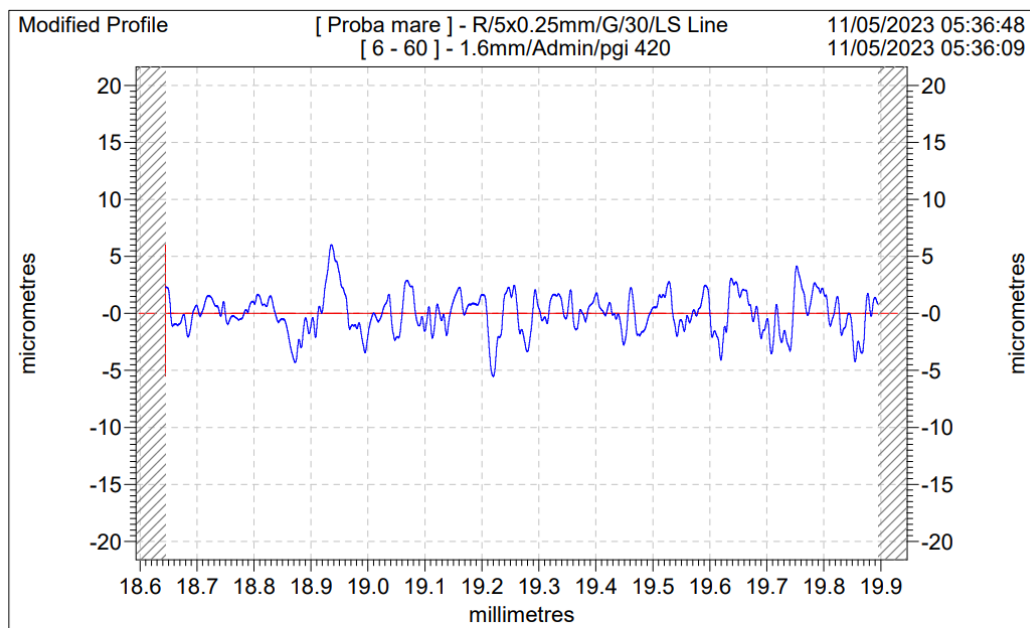
Ra	1.3938	µm
Rz	8.4979	µm
Rt	13.7025	µm

Figure S36. 6-20 Ti4Al6V



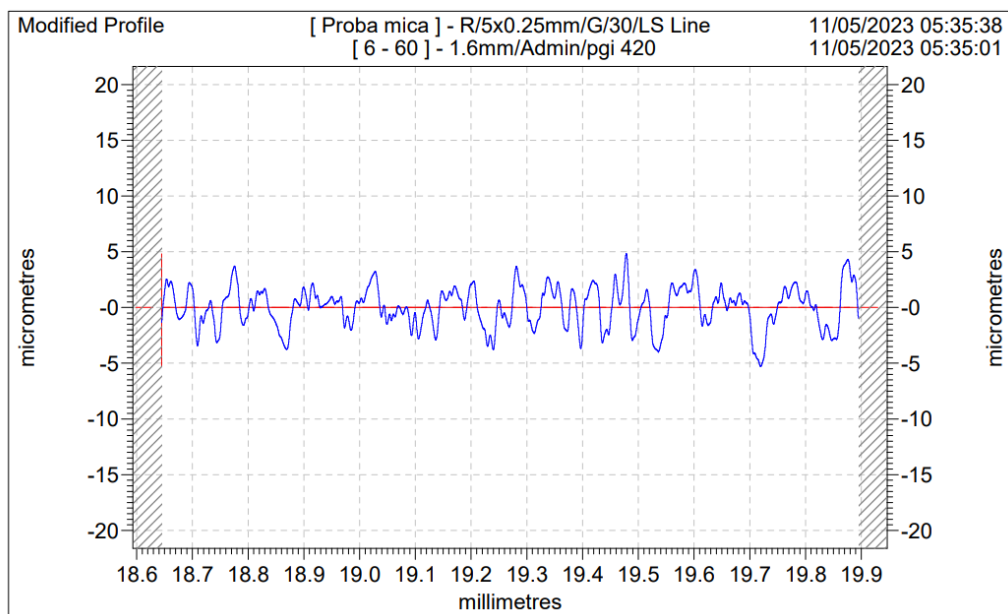
Ra	0.9965	µm
Rz	6.0890	µm
Rt	11.6382	µm

Figure S37. 6-20 Ti



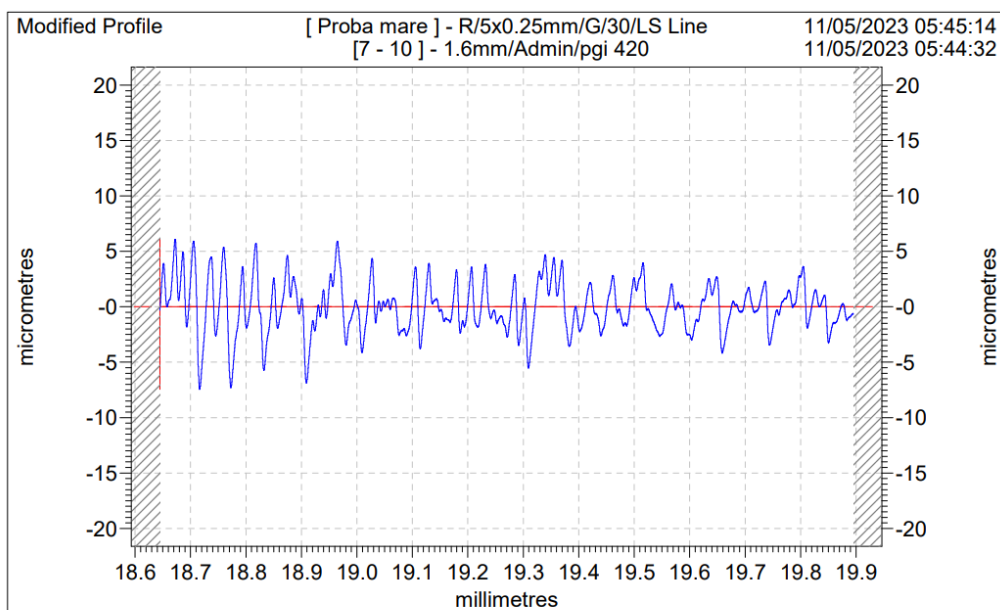
Ra	1.3708	µm
Rz	7.9082	µm
Rt	11.5210	µm

Figure S38.6-60 Ti4Al6V



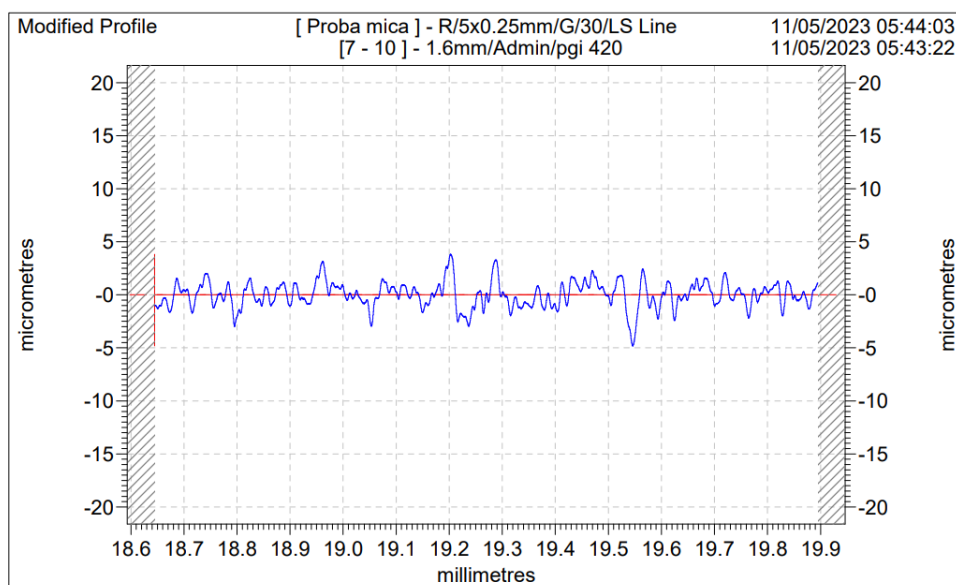
Ra	1.4875	µm
Rz	7.8945	µm
Rt	10.1066	µm

Figure S39. 6-60 Ti



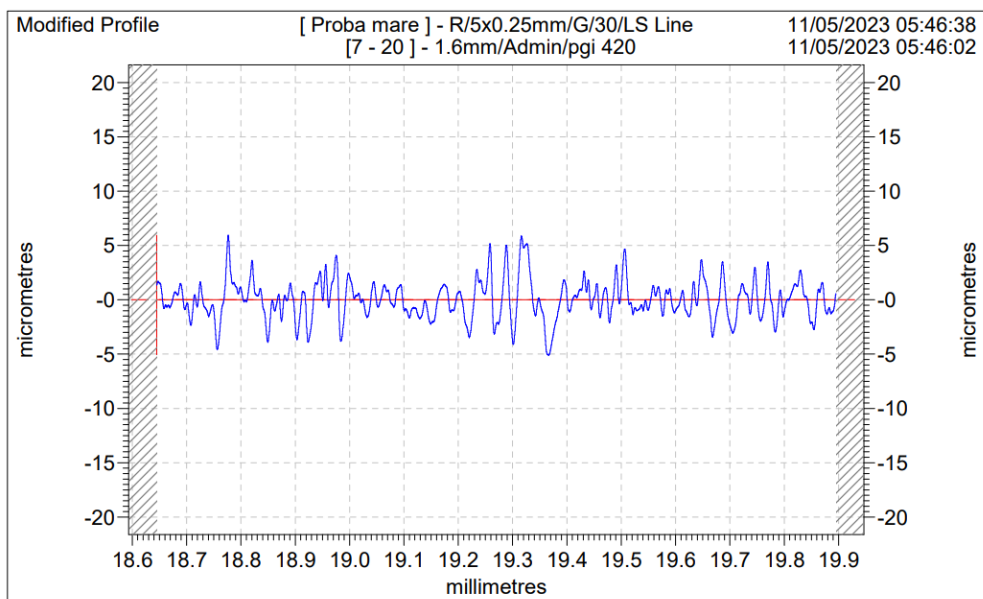
Ra	1.7690	µm
Rz	10.2398	µm
Rt	13.5433	µm

Figure S40. 7-10 Ti4Al6V



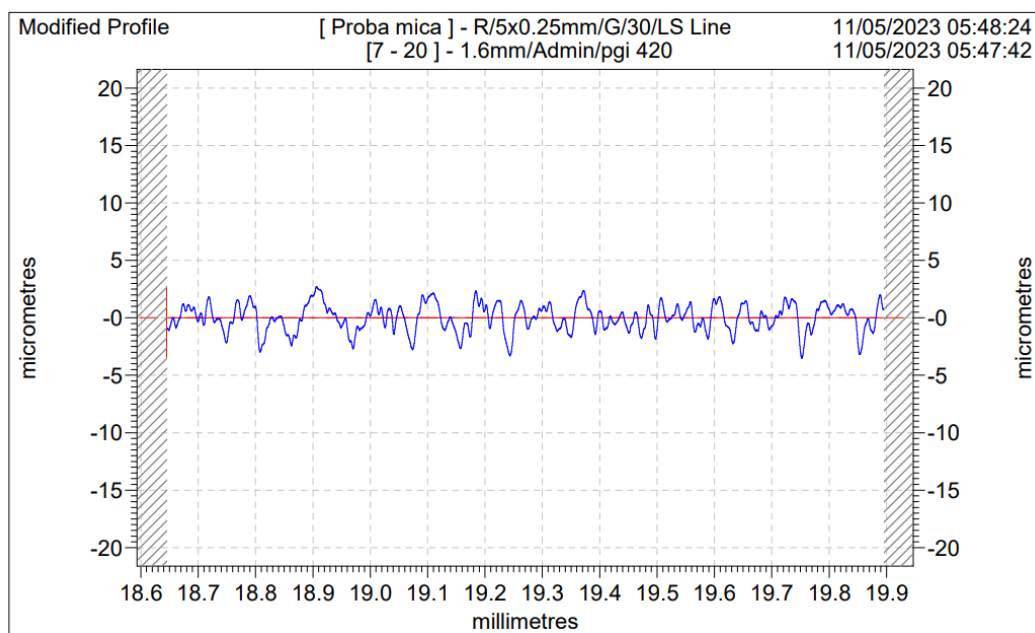
Ra	0.9348	µm
Rz	5.8611	µm
Rt	8.6394	µm

Figure S41. 7-10 Ti



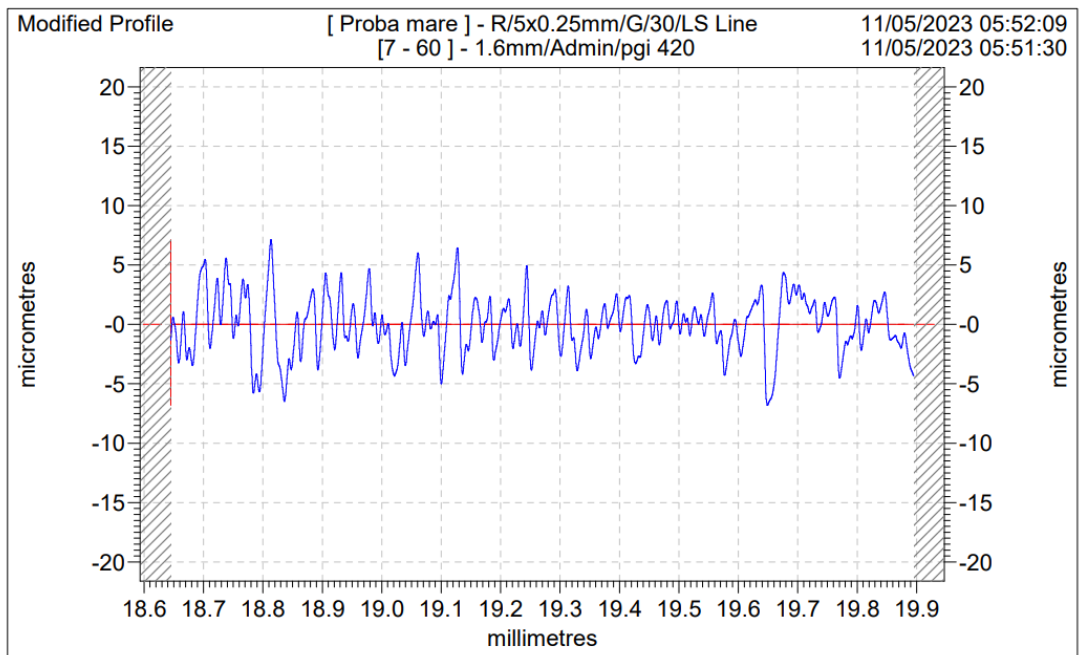
Ra	1.3630	μm
Rz	8.6667	μm
Rt	10.9982	μm

Figure S42. 7-20 Ti4Al6V



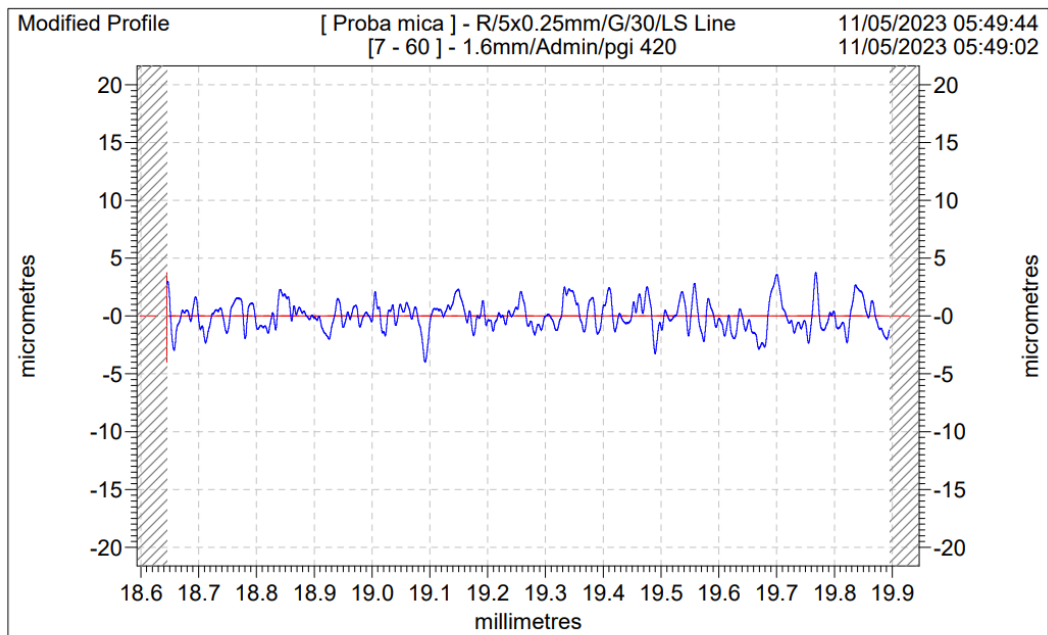
Ra	0.9550	μm
Rz	5.0926	μm
Rt	6.1705	μm

Figure S43. 7-20 Ti



Ra	1.8821	µm
Rz	10.5107	µm
Rt	13.9463	µm

Figure S44. 7-60 Ti4Al6V



Ra	0.9795	µm
Rz	5.7488	µm
Rt	7.7465	µm

Figure S45. 7-60 Ti

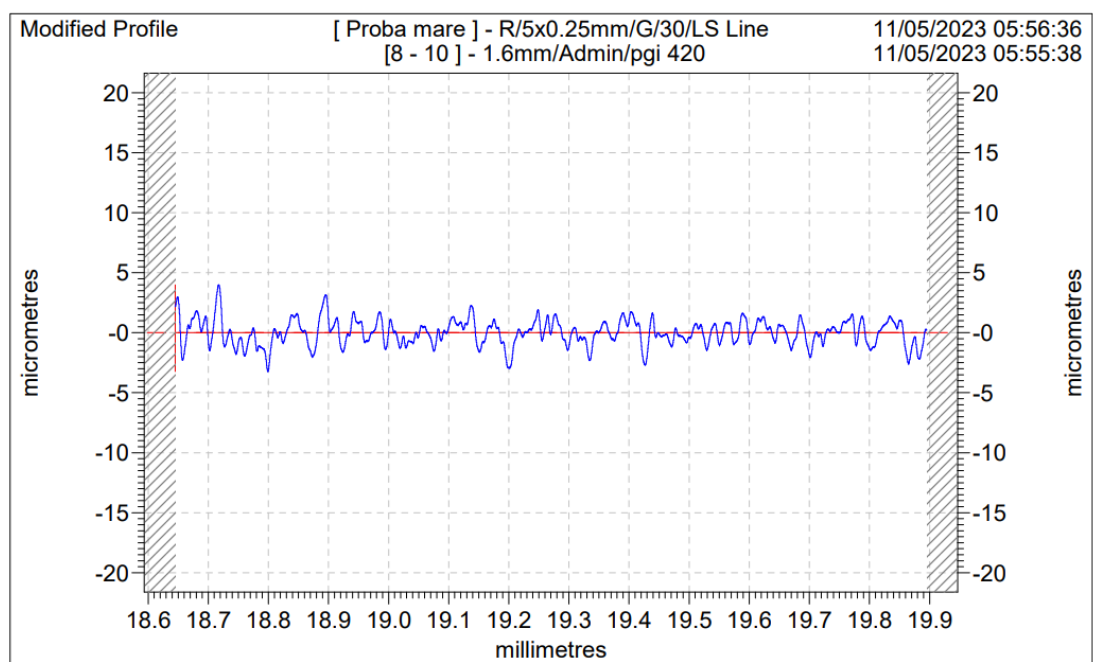


Figure S46. 8-10 Ti4Al6V

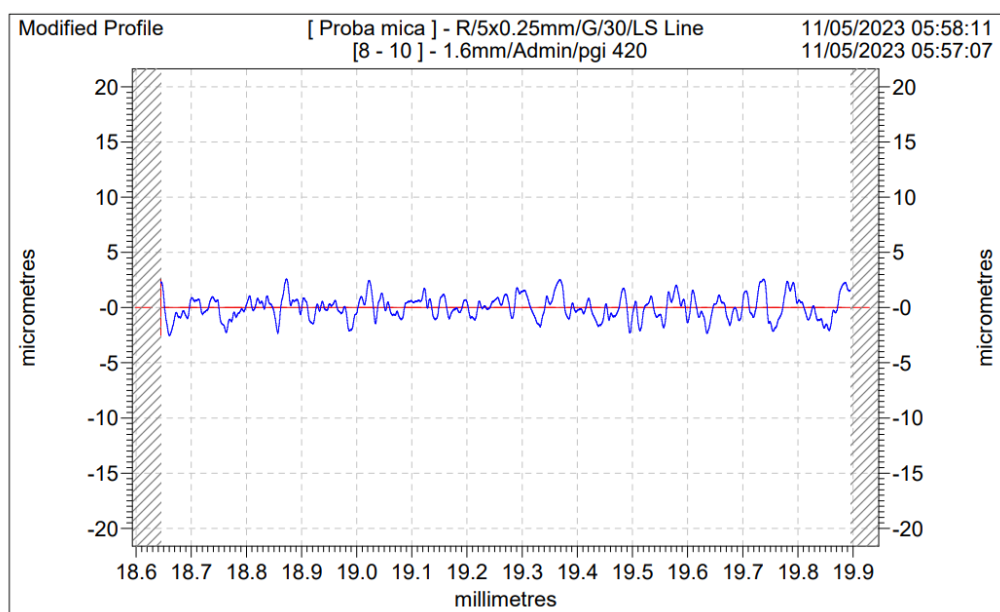
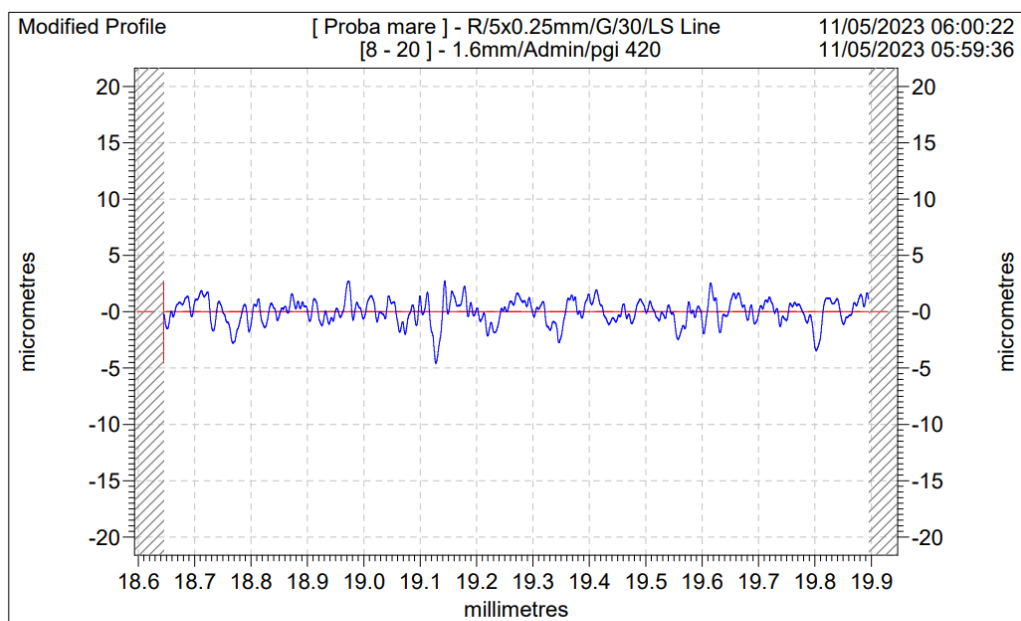
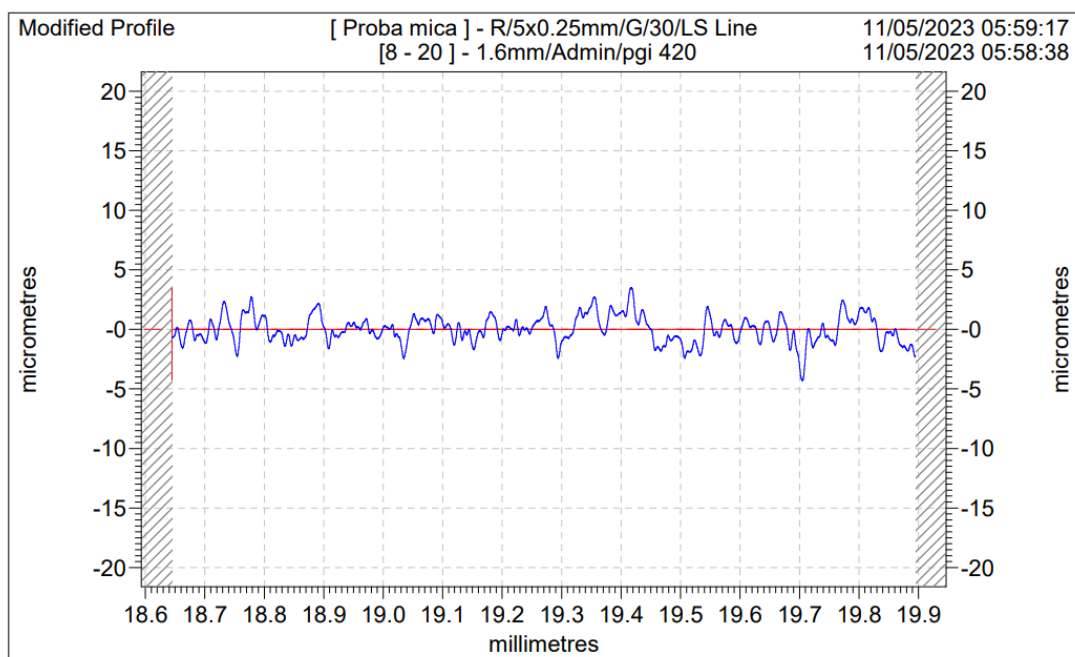


Figure S47. 8-10 Ti



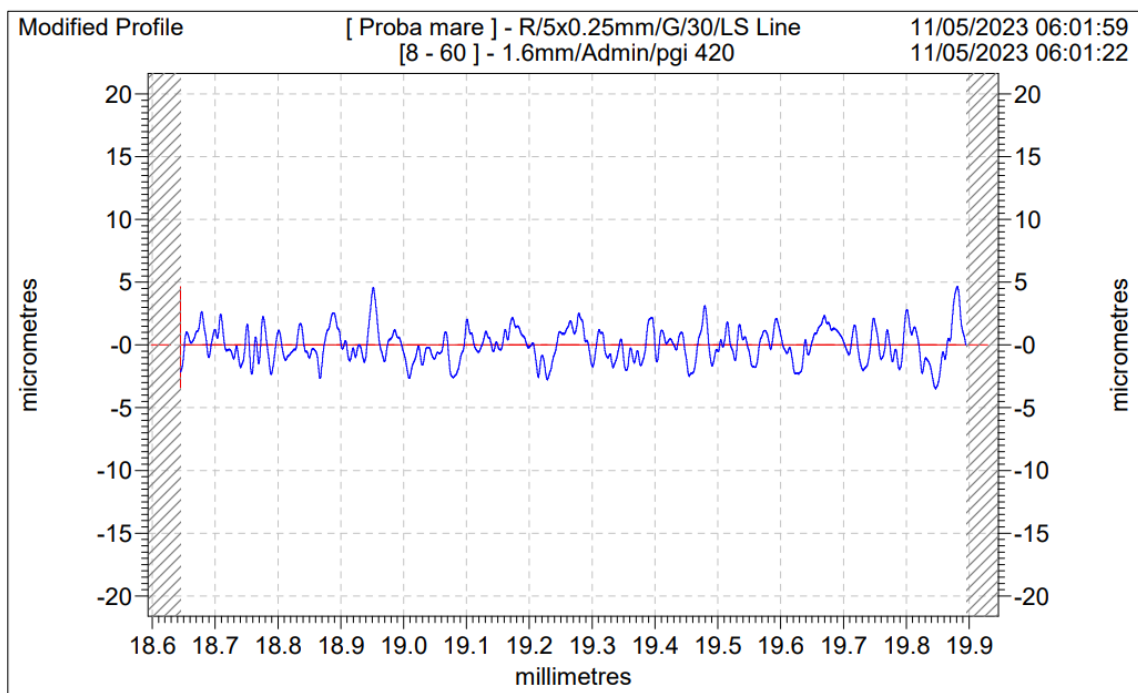
Ra	0.8610	µm
Rz	5.4010	µm
Rt	7.2951	µm

Figure S48. 8-20 Ti4Al6V



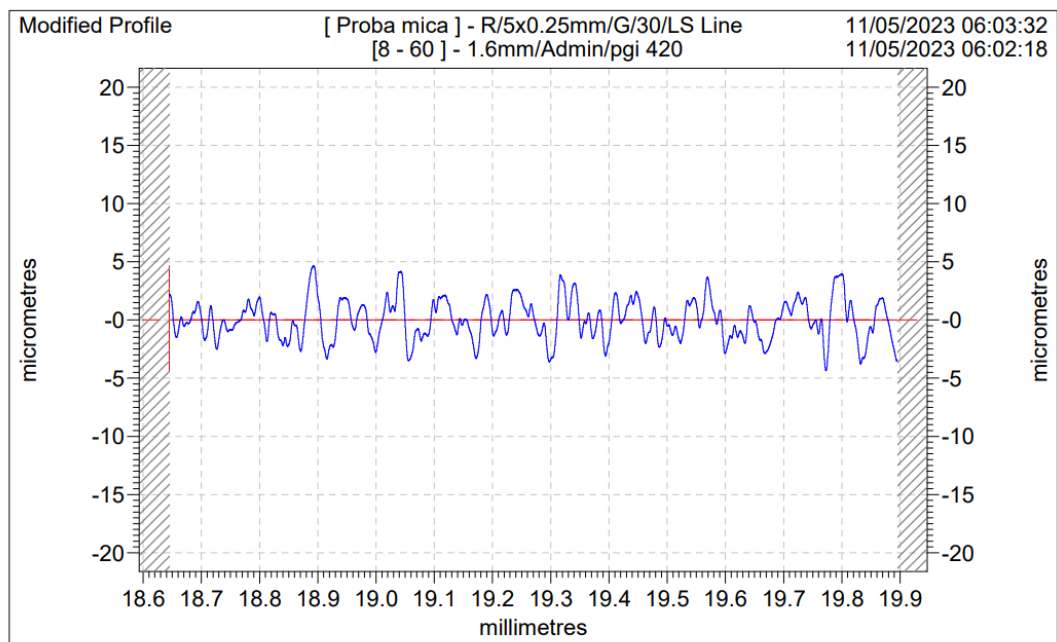
Ra	0.8960	µm
Rz	5.2891	µm
Rt	7.7786	µm

Figure S49. 8-20 Ti



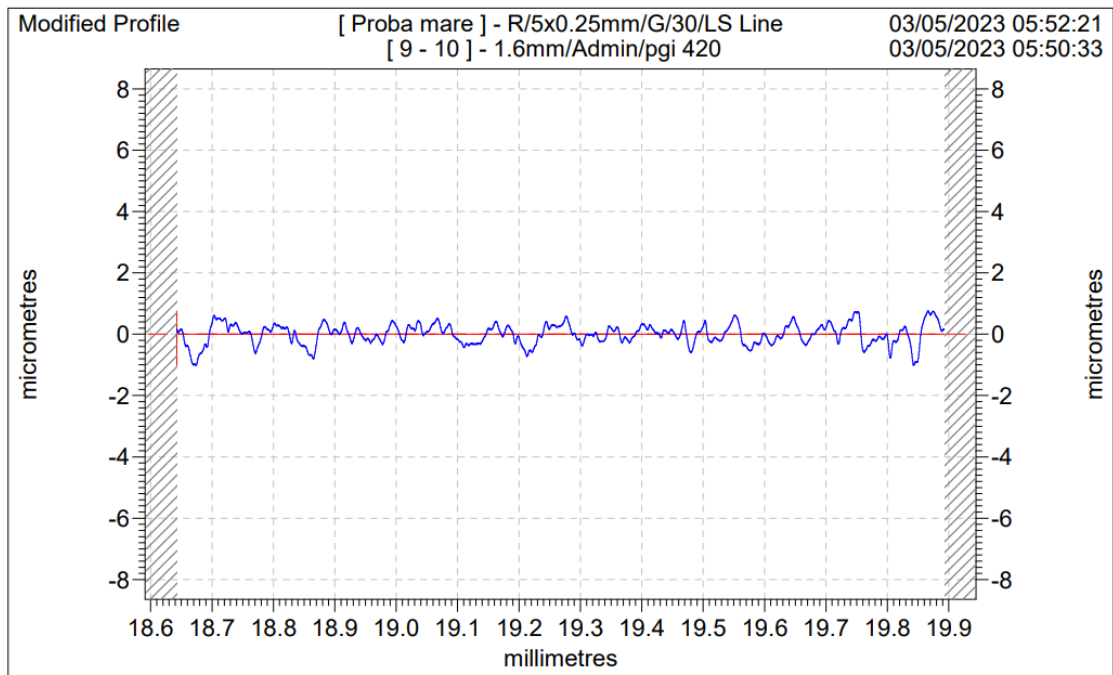
Ra	1.0868	µm
Rz	6.2840	µm
Rt	8.0730	µm

Figure S50. 8-60 Ti4Al6V



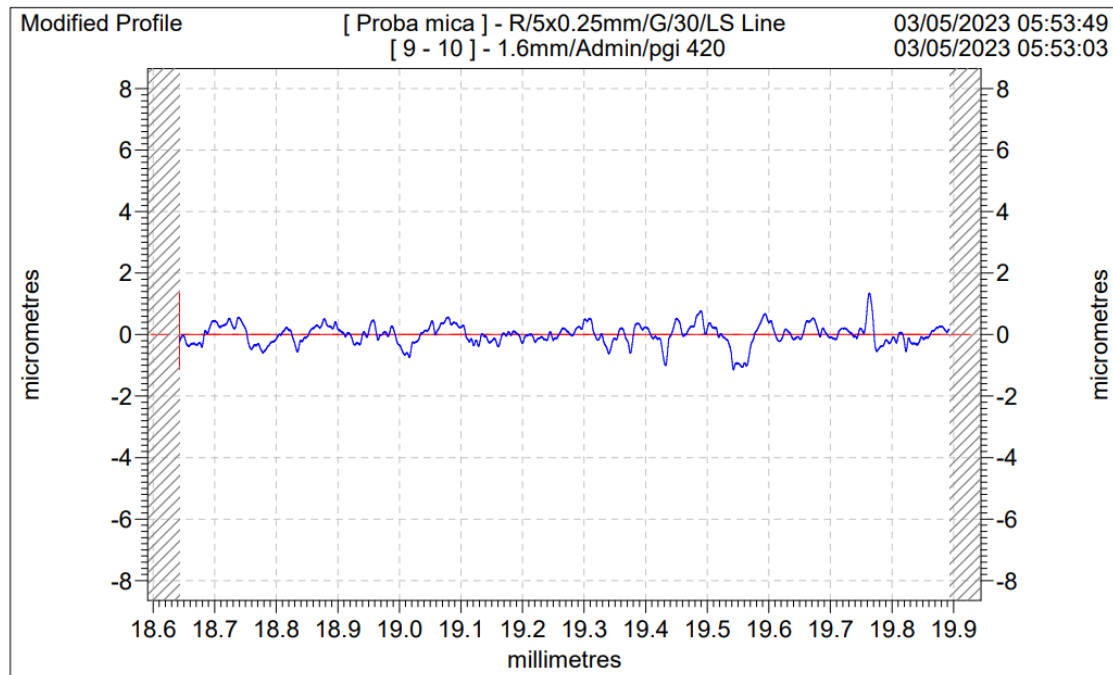
Ra	1.3878	µm
Rz	7.5126	µm
Rt	9.0144	µm

Figure S51. 8-60 Ti



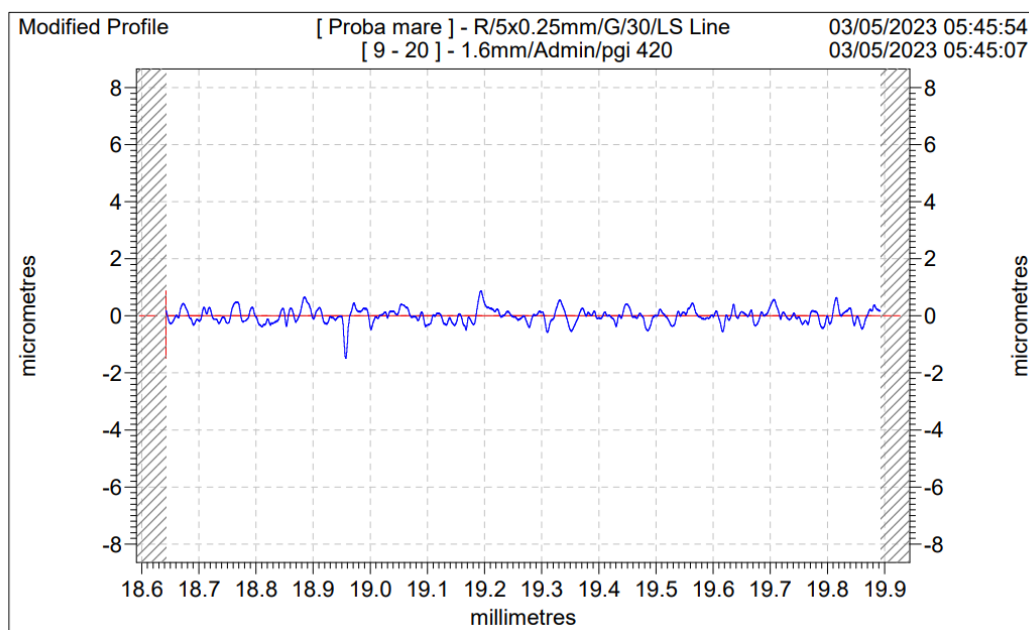
Ra	0.2623	µm
Rz	1.3684	µm
Rt	1.7738	µm

Figure S52. 9-10 Ti4Al6V



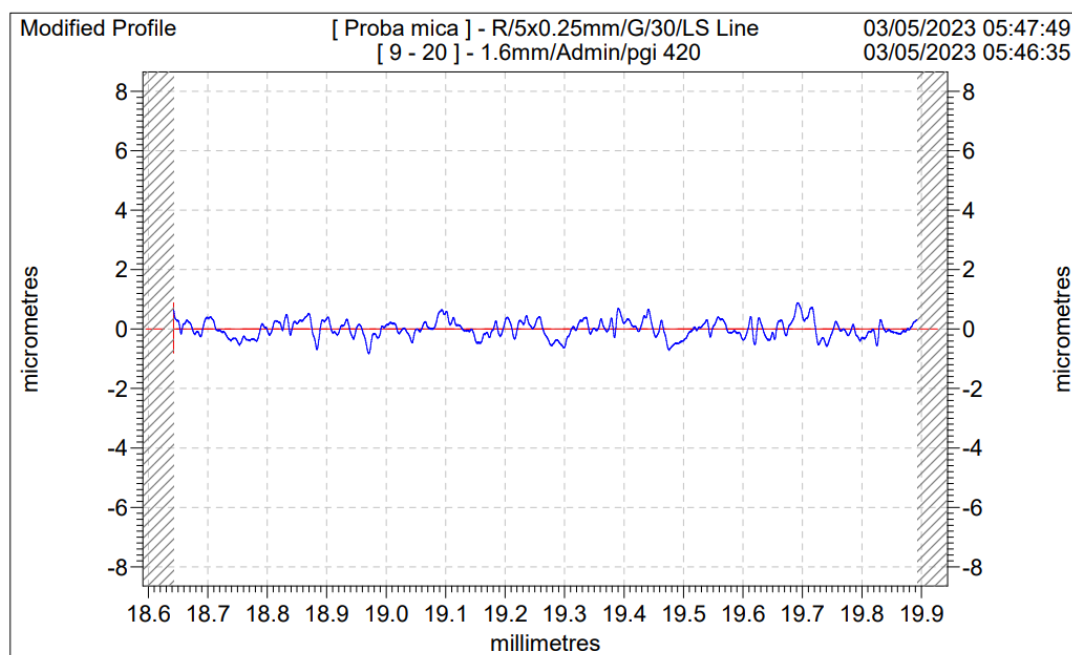
Ra	0.2522	µm
Rz	1.4759	µm
Rt	2.4738	µm

Figure S53. 9-10 Ti



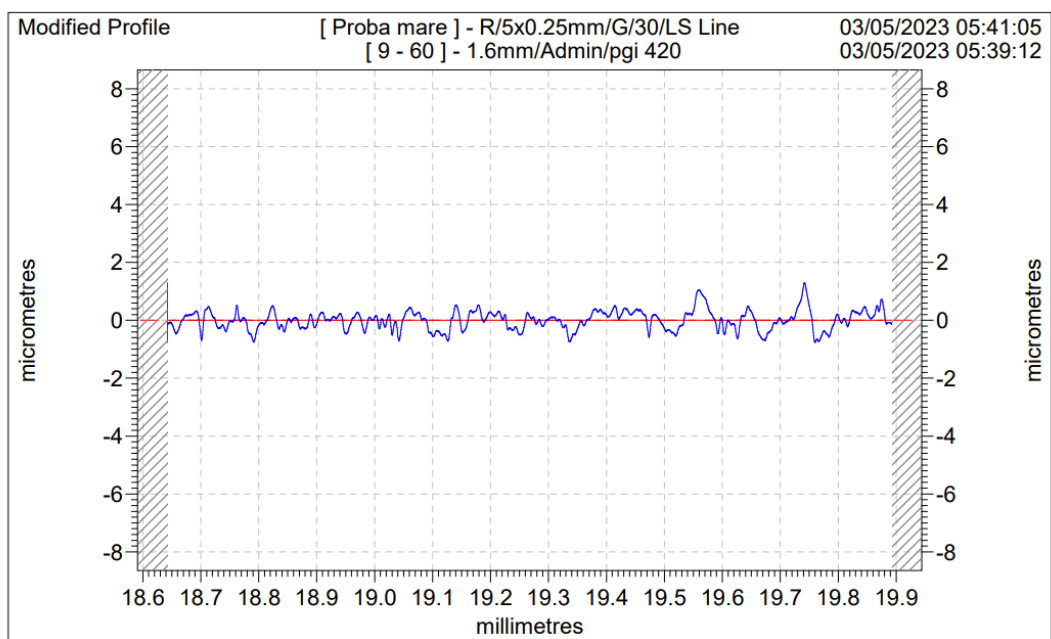
Ra	0.1886	µm
Rz	1.3032	µm
Rt	2.3585	µm

Figure S54. 9-20 Ti4Al6V



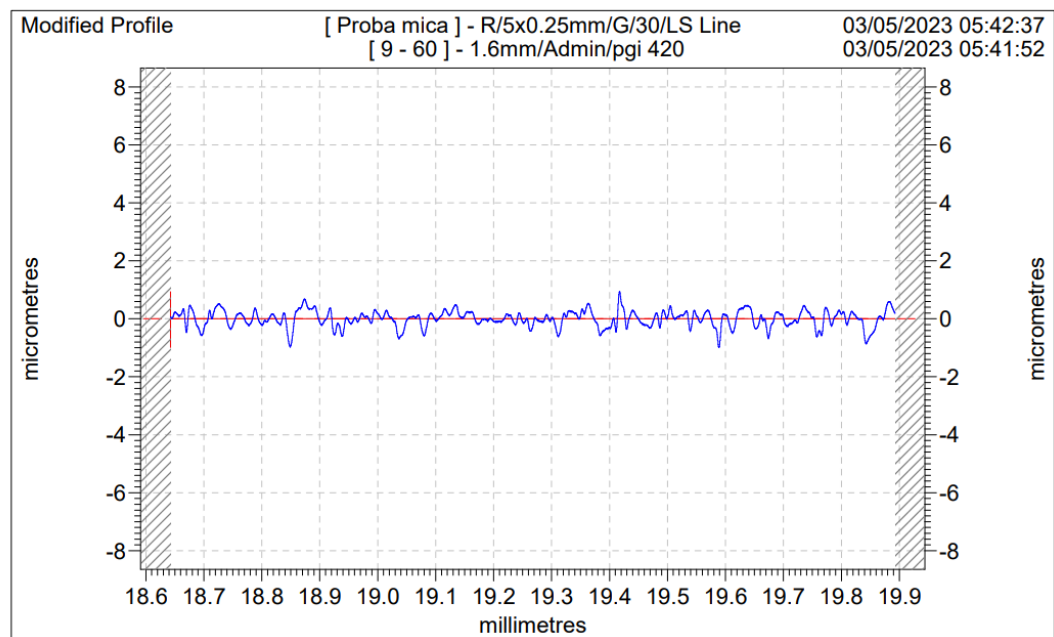
Ra	0.2336	µm
Rz	1.3873	µm
Rt	1.6995	µm

Figure S55. 9-20 Ti



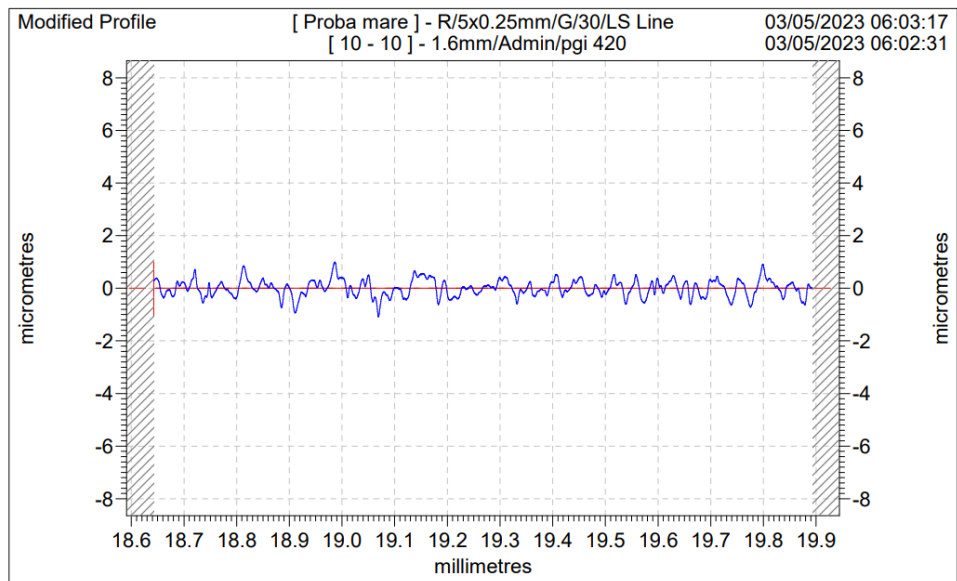
Ra	0.2613	µm
Rz	1.5025	µm
Rt	2.0622	µm

Figure S56. 9-60 Ti4Al6V



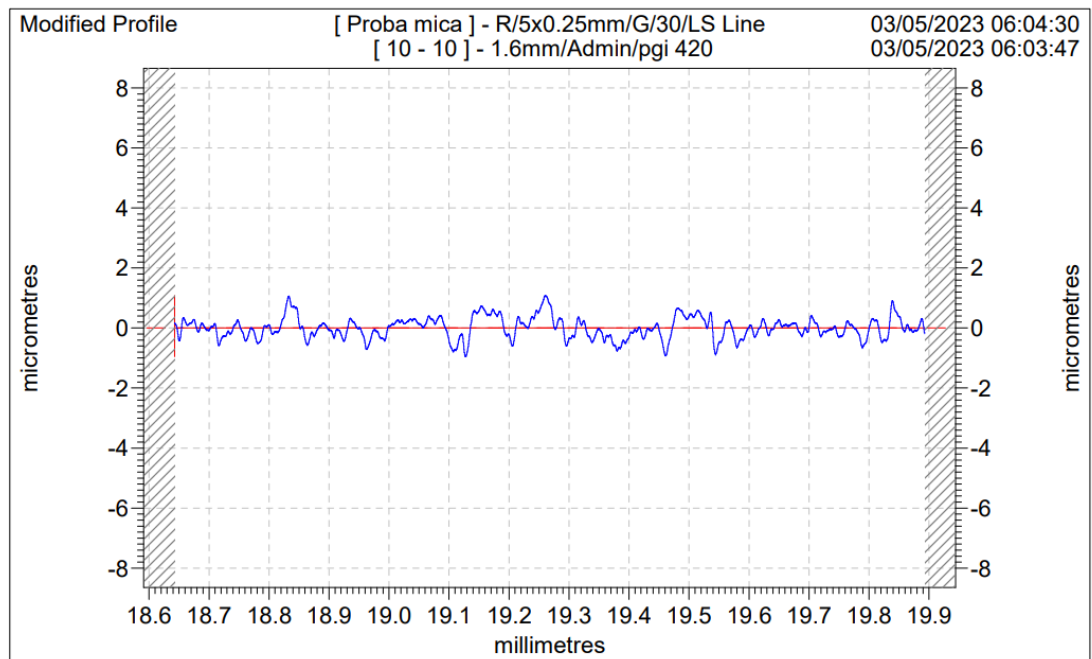
Ra	0.2181	µm
Rz	1.4578	µm
Rt	1.9224	µm

Figure S57. 9-60 Ti



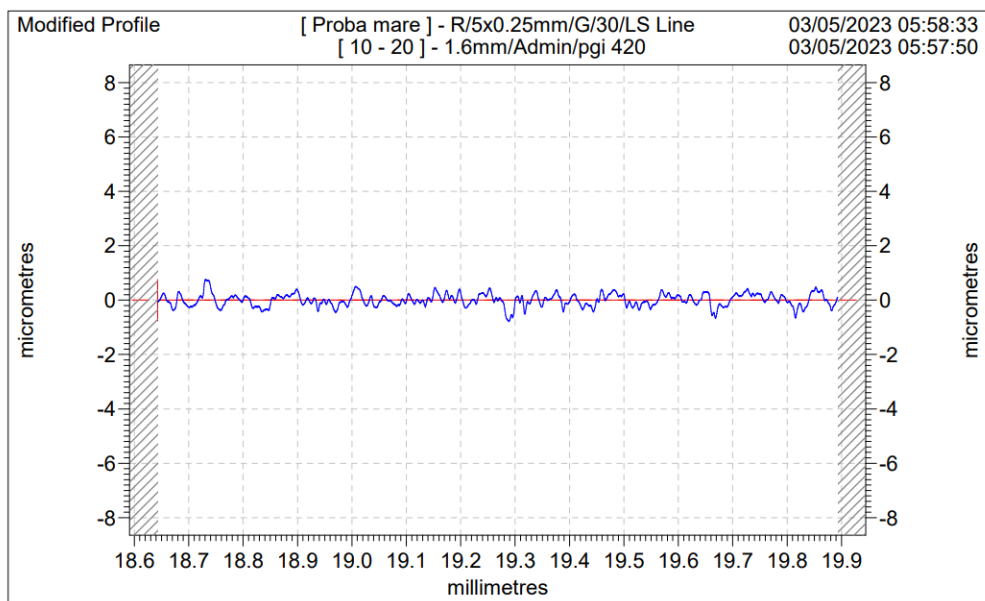
Ra	0.2526	µm
Rz	1.5102	µm
Rt	2.0543	µm

Figure S58. 10-10 Ti4Al6V



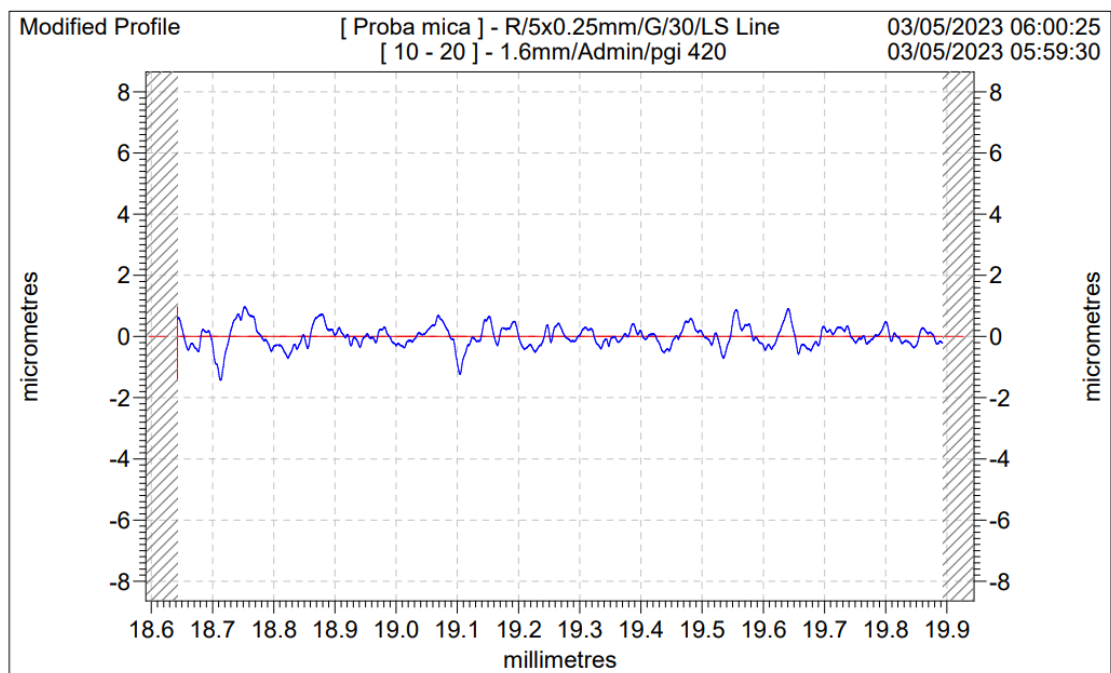
Ra	0.2791	µm
Rz	1.6354	µm
Rt	2.0345	µm

Figure S59. 10-10 Ti



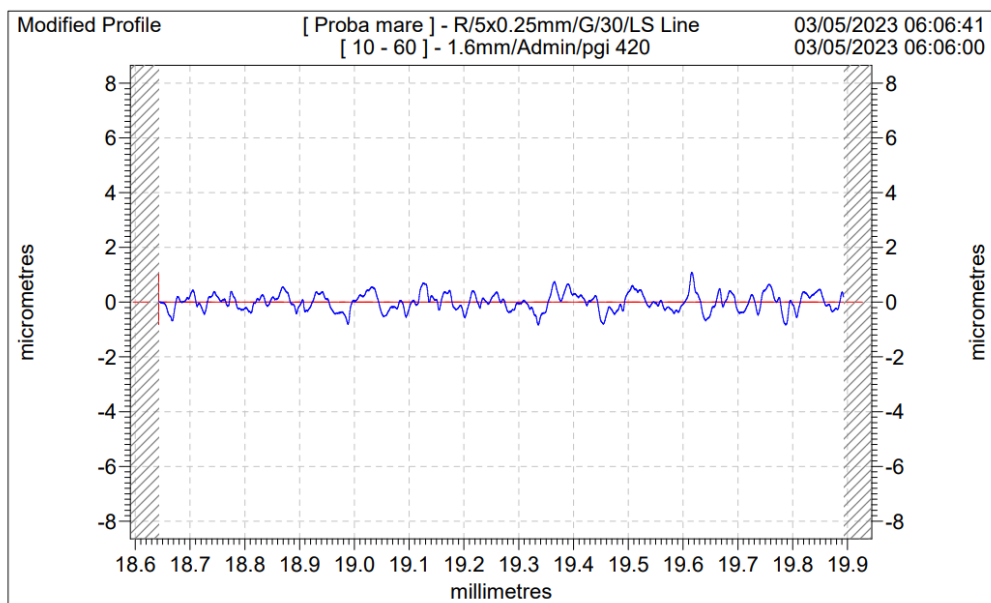
Ra	0.1833	µm
Rz	1.0582	µm
Rt	1.5238	µm

Figure S60. 10-20 Ti4Al6V



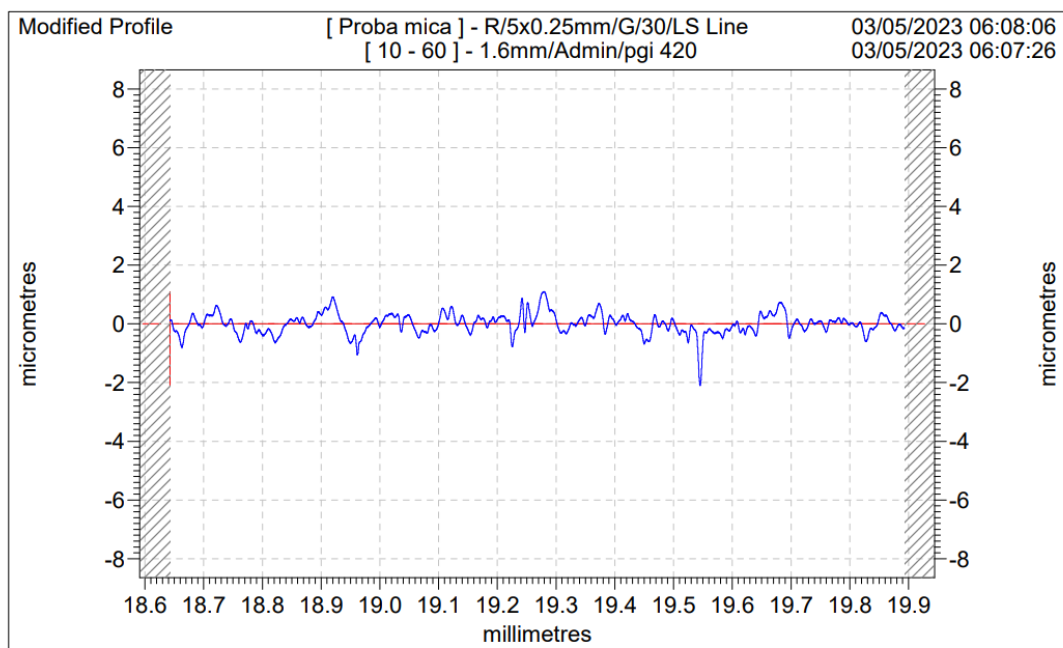
Ra	0.2750	µm
Rz	1.6934	µm
Rt	2.4004	µm

Figure S61. 10-20 Ti



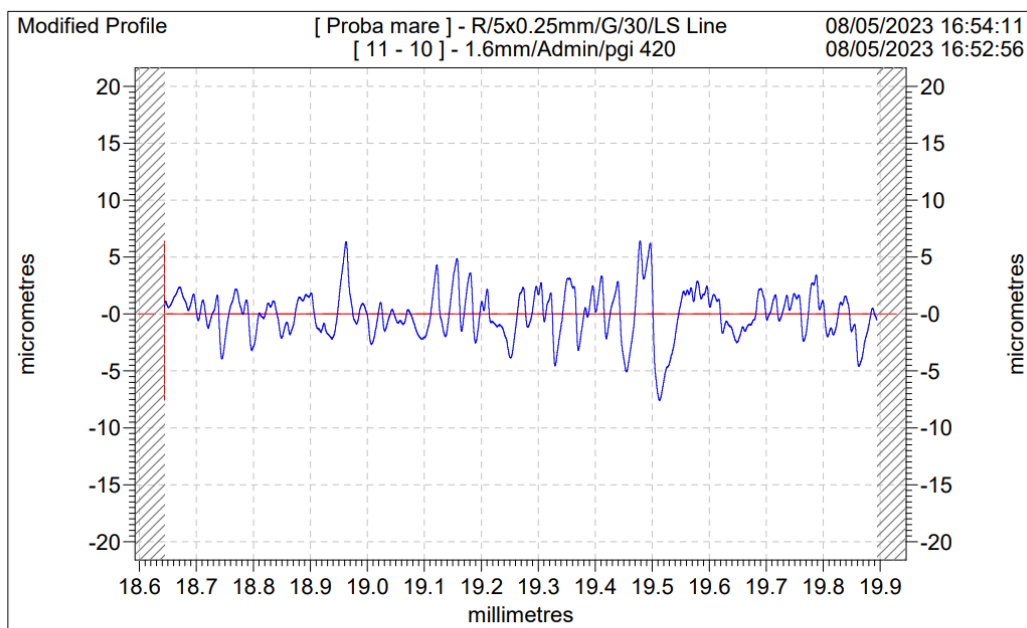
Ra	0.2588	µm
Rz	1.5292	µm
Rt	1.9037	µm

Figure S62. 10-60 Ti4Al6V



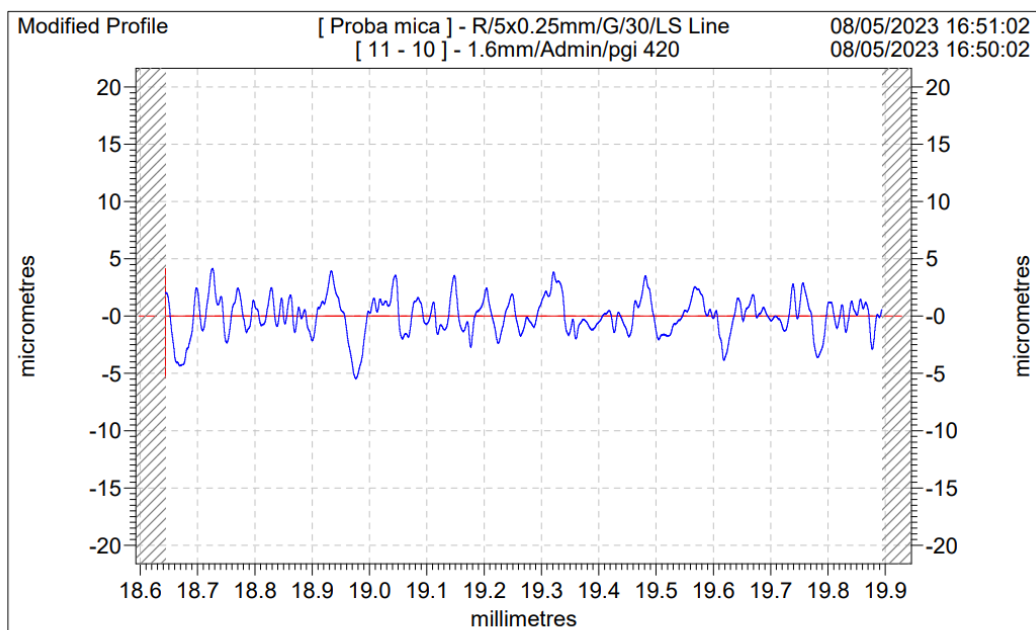
Ra	0.2556	µm
Rz	1.8085	µm
Rt	3.1932	µm

Figure S63. 10-60 Ti



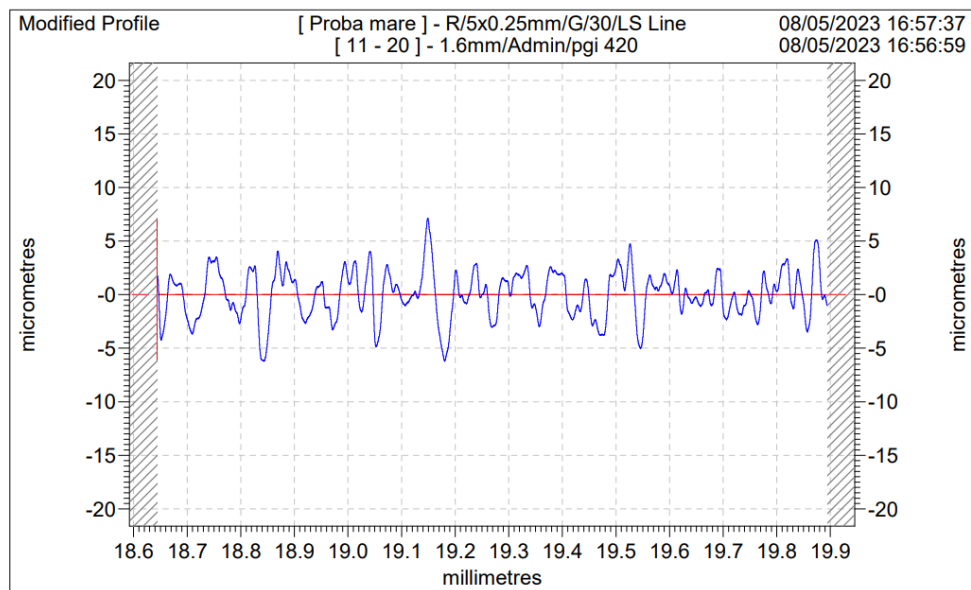
Ra	1.6319	µm
Rz	9.3322	µm
Rt	13.9777	µm

Figure S64. 11-10 Ti4Al6V



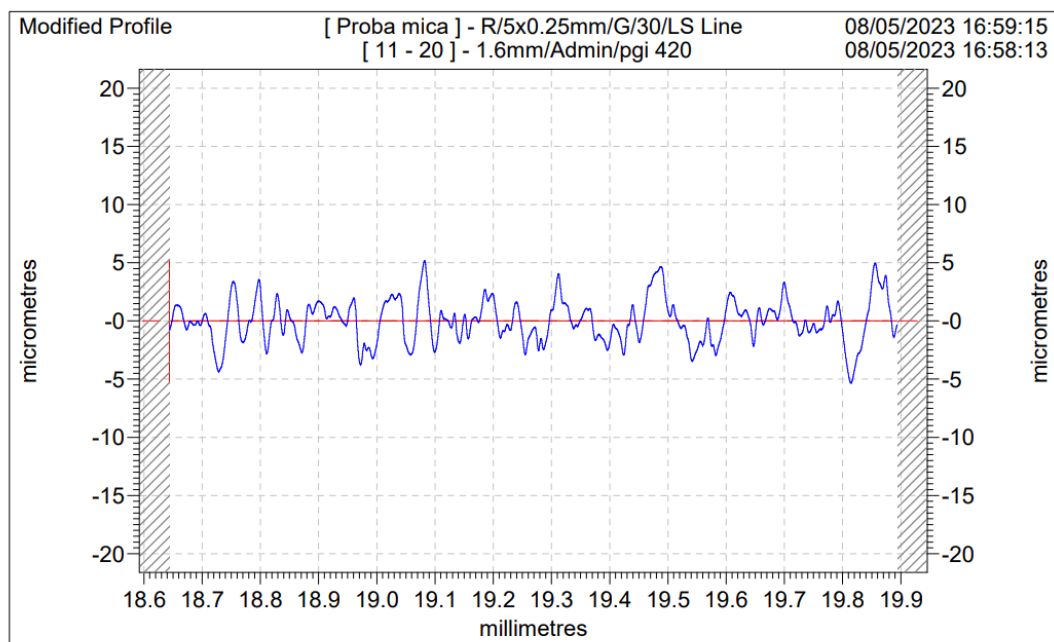
Ra	1.3071	µm
Rz	7.6470	µm
Rt	9.5878	µm

Figure S65. 11-10 Ti



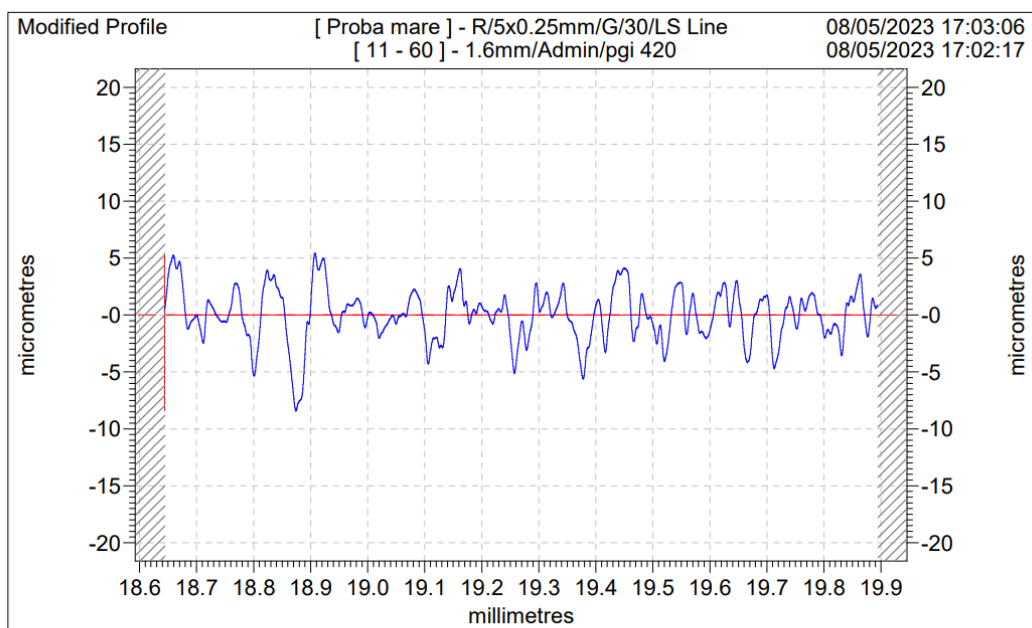
Ra	1.7691	µm
Rz	10.2638	µm
Rt	13.2997	µm

Figure S66. 11-20 Ti4Al6V



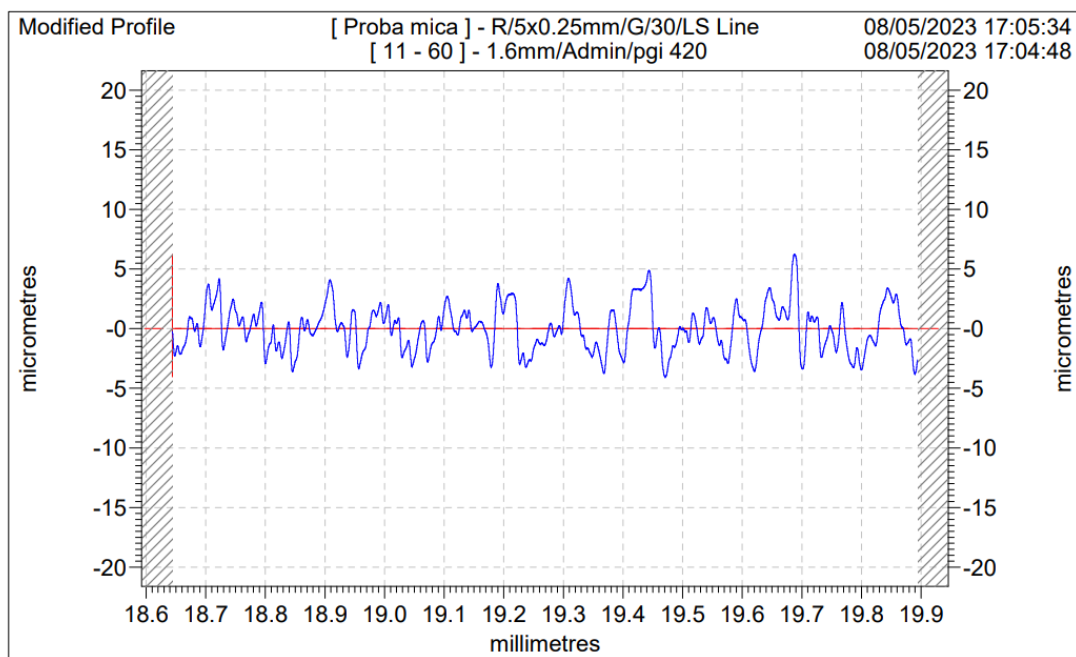
Ra	1.4519	µm
Rz	8.4372	µm
Rt	10.5221	µm

Figure S67. 11-20 Ti



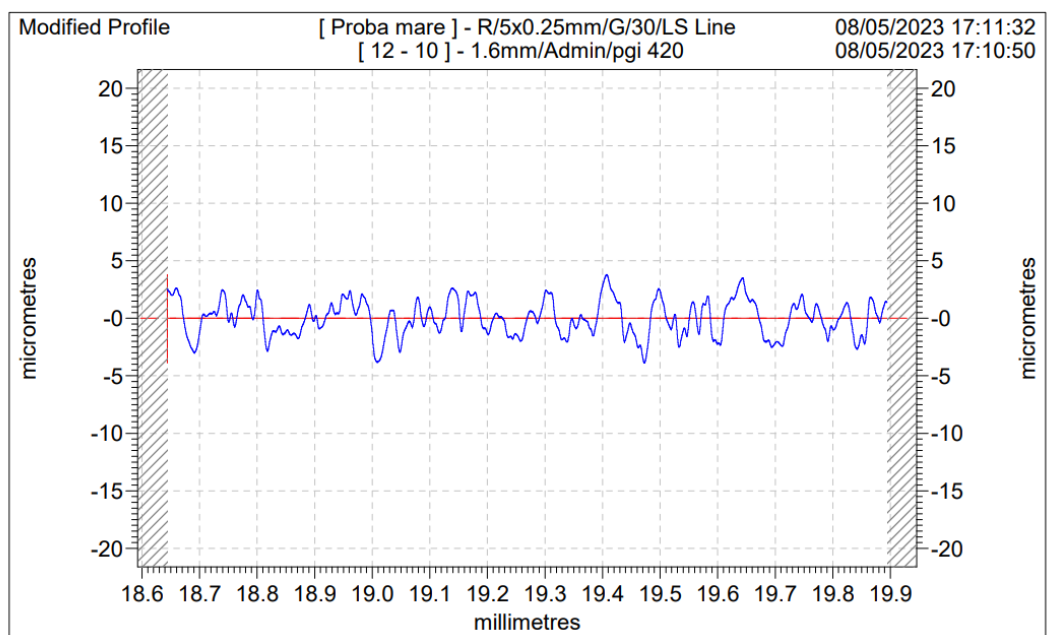
Ra	1.7595	µm
Rz	9.9007	µm
Rt	13.8180	µm

Figure S68. 11-60 Ti4Al6V



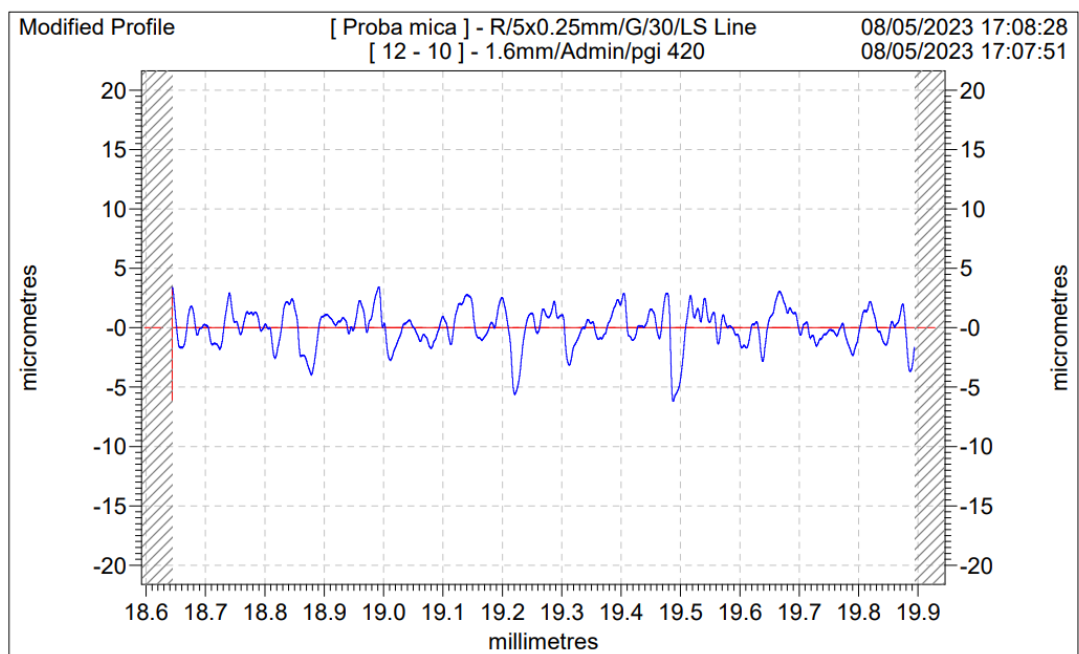
Ra	1.5617	µm
Rz	8.4166	µm
Rt	10.2618	µm

Figure S69. 11-60 Ti



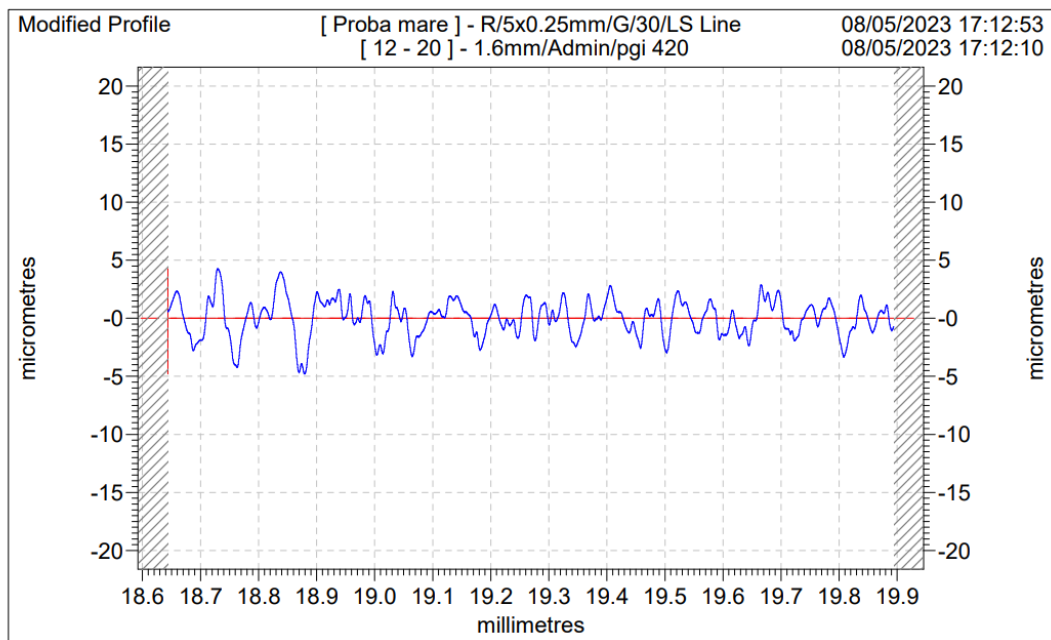
Ra	1.2783	µm
Rz	6.0566	µm
Rt	7.6886	µm

Figure S70. 12-10 Ti4Al6V



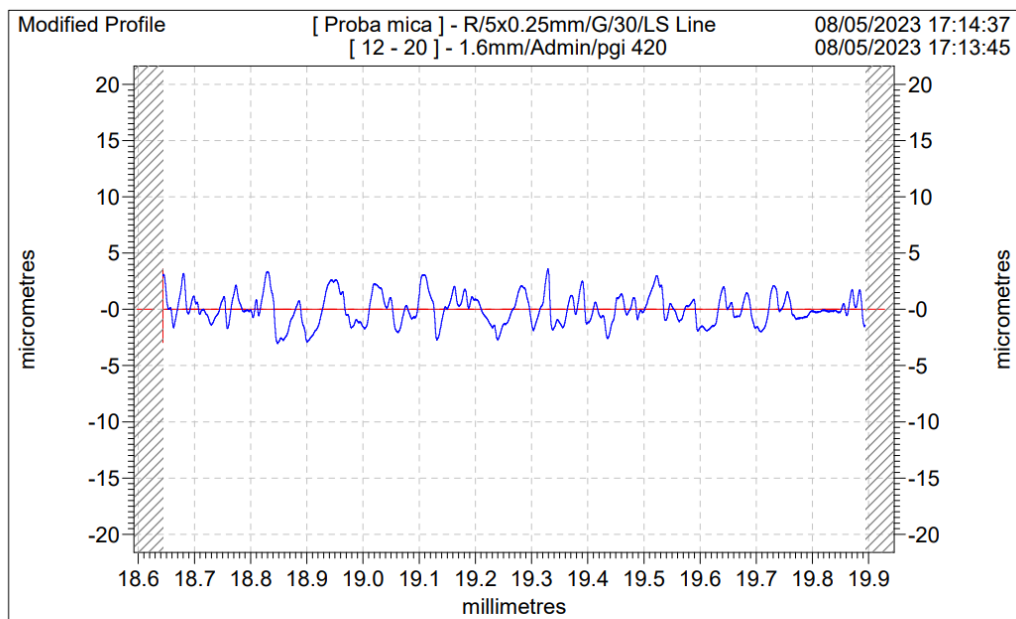
Ra	1.2256	µm
Rz	7.5250	µm
Rt	9.6435	µm

Figure S71. 12-10 Ti



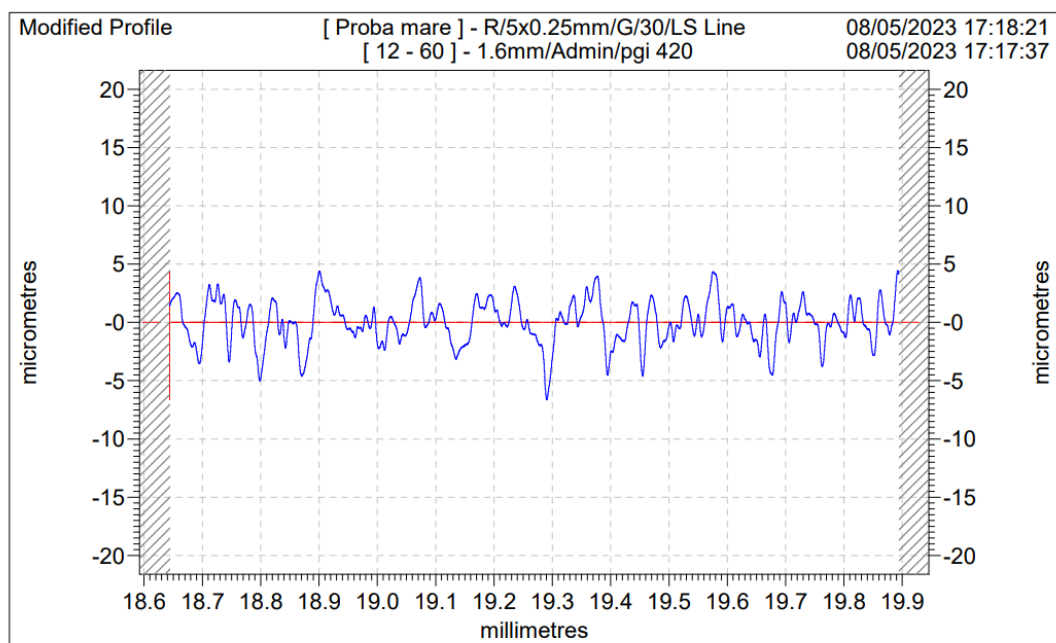
Ra	1.2737	µm
Rz	6.3245	µm
Rt	9.0682	µm

Figure S72. 12-20 Ti4Al6V



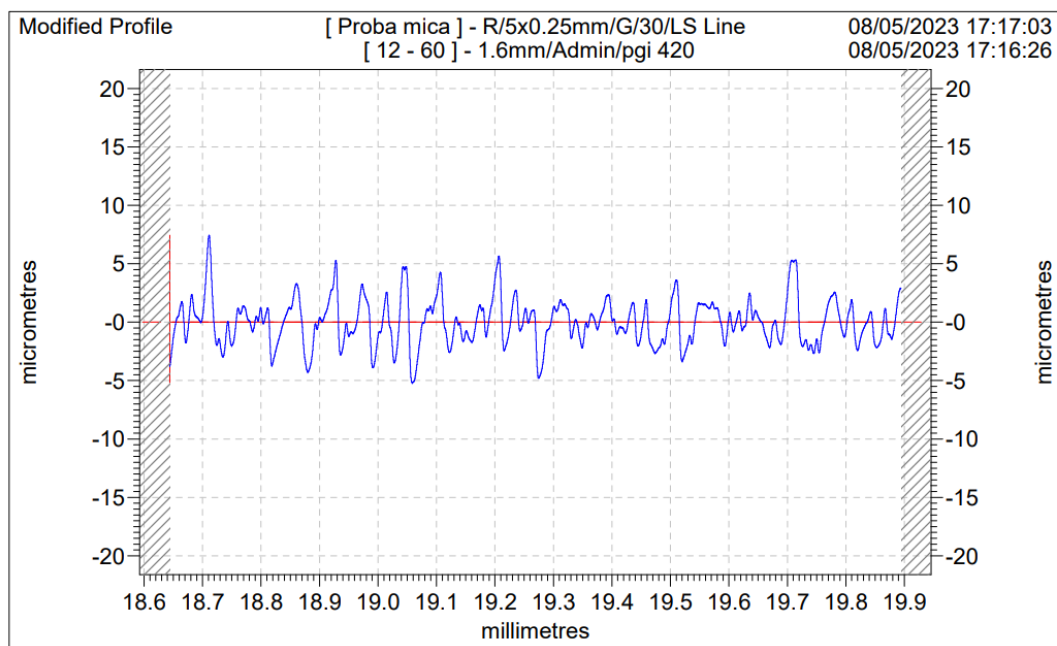
Ra	1.0687	µm
Rz	5.6315	µm
Rt	6.5529	µm

Figure S73. 12-20 Ti



Ra	1.4867	µm
Rz	8.8462	µm
Rt	11.0882	µm

Figure S74. 12-60 Ti4Al6V



Ra	1.5177	µm
Rz	9.5162	µm
Rt	12.6109	µm

Figure S75.12-60 Ti

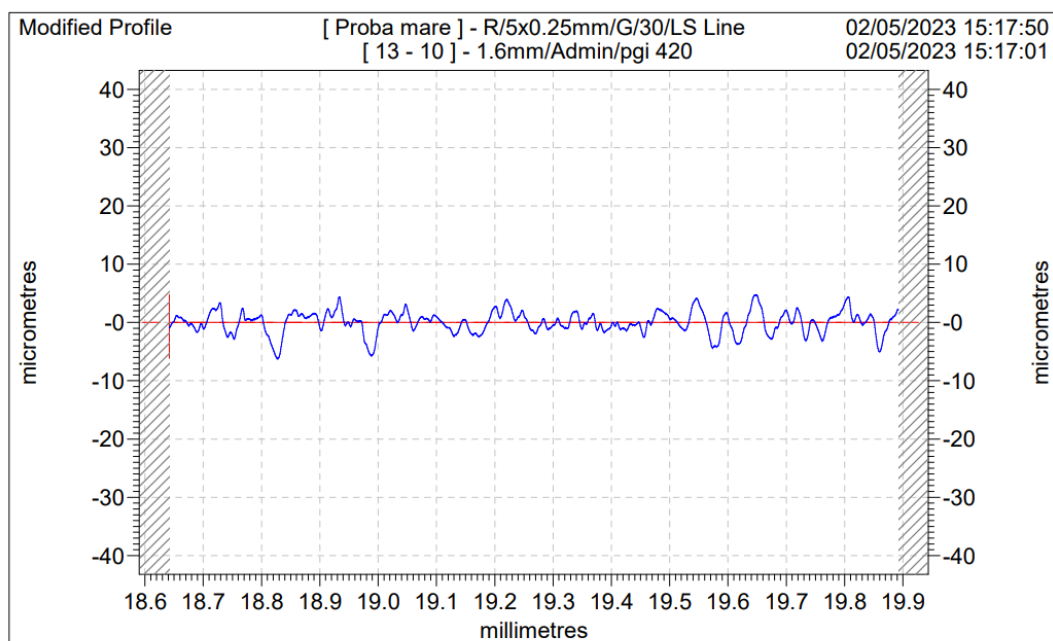


Figure S76. 13-10 Ti4Al6V

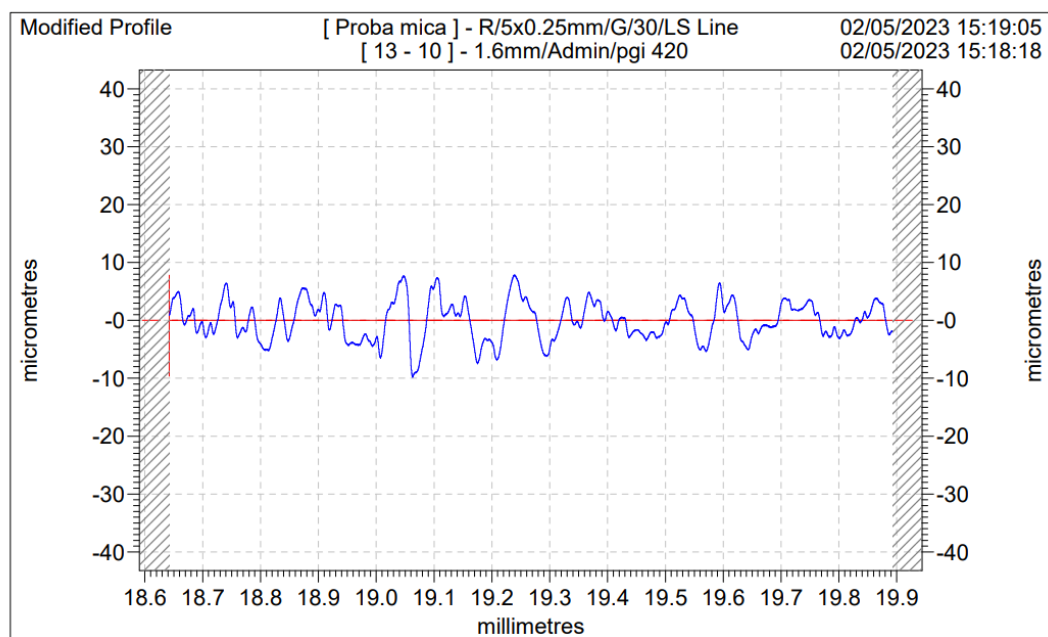
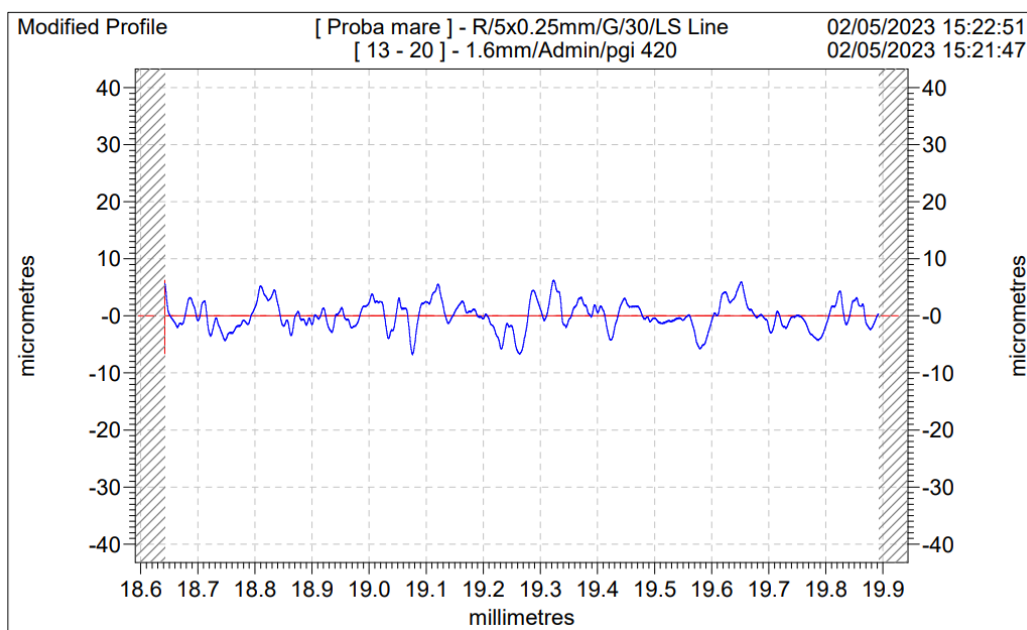
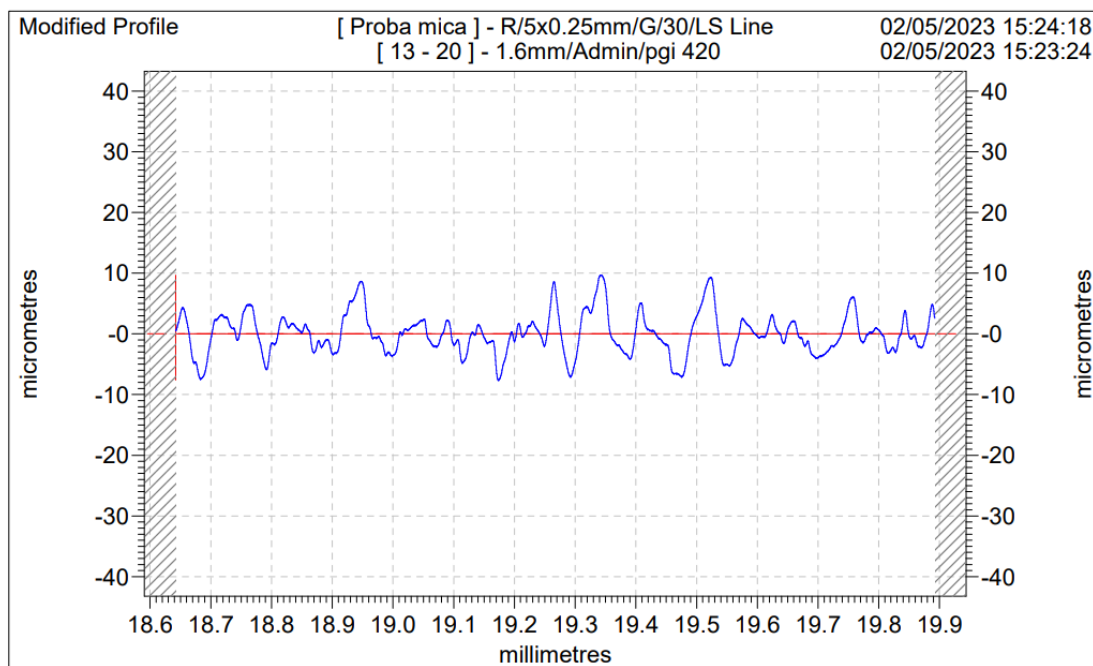


Figure S77. 13-10 Ti



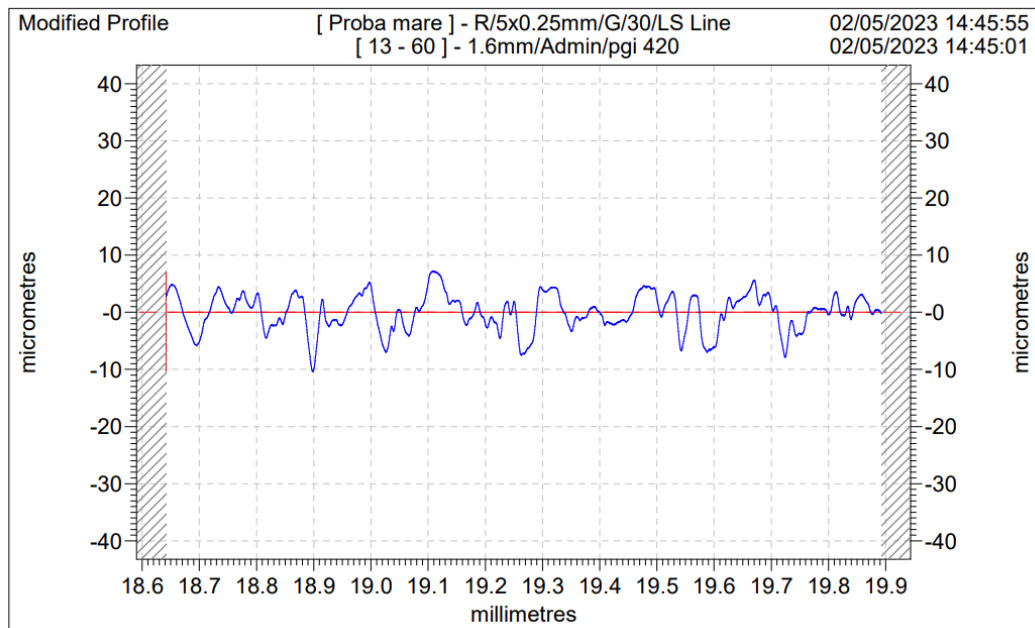
Ra	1.9282	µm
Rz	10.9856	µm
Rt	12.8663	µm

Figure S78. 13-20 Ti4Al6V



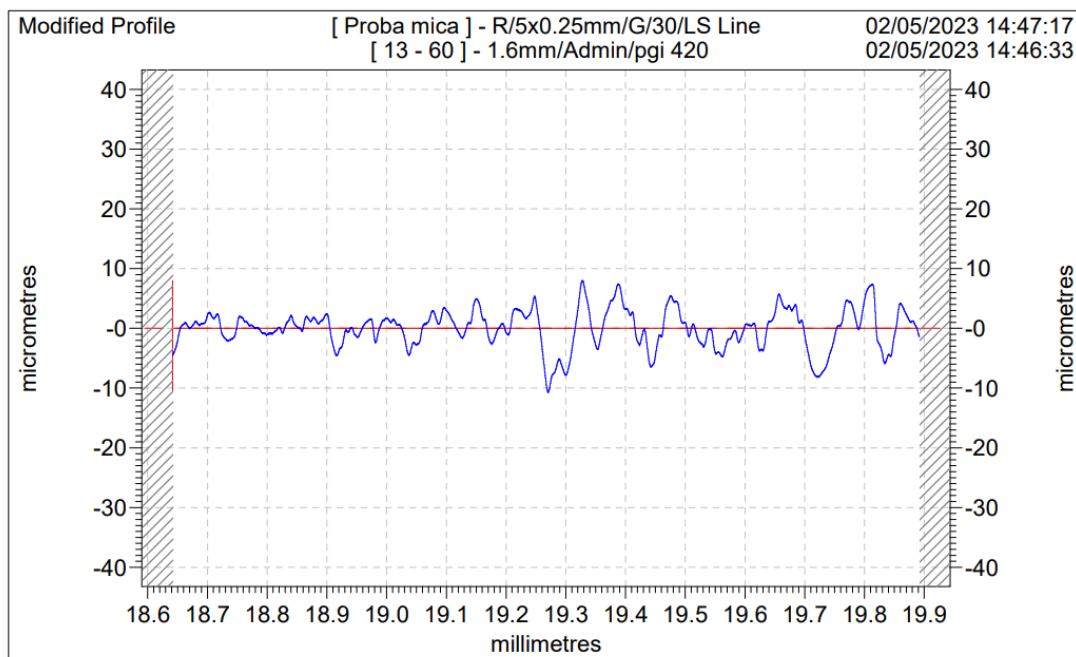
Ra	2.5769	µm
Rz	13.8647	µm
Rt	17.2812	µm

Figure S79. 13-20 Ti



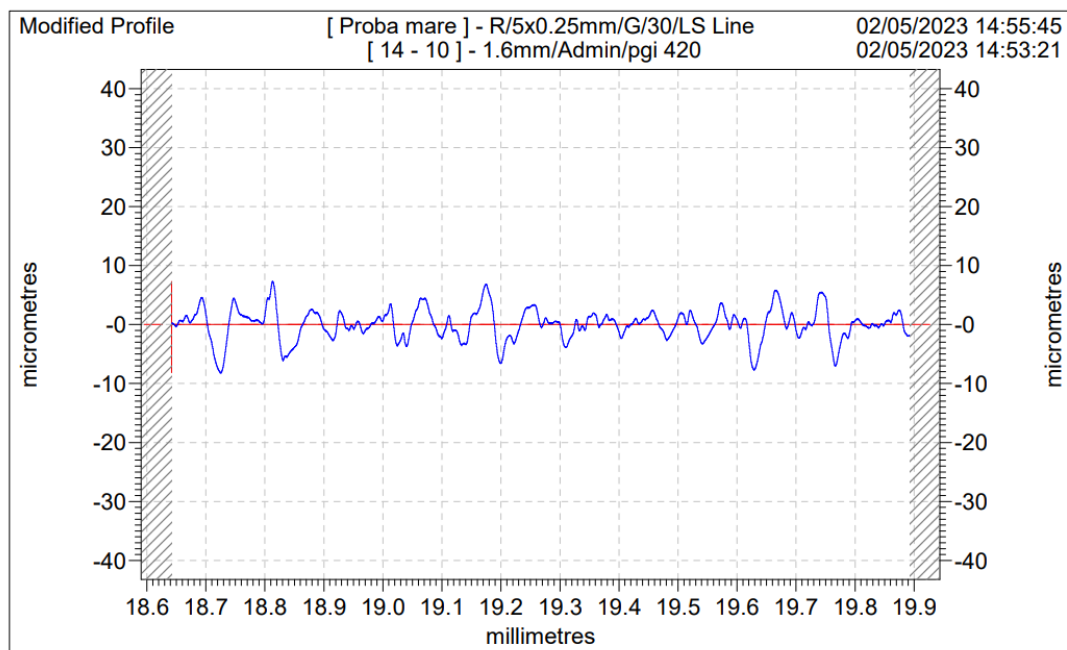
Ra	2.5735	µm
Rz	13.1568	µm
Rt	17.5920	µm

Figure S80. 13-60 Ti4Al6V



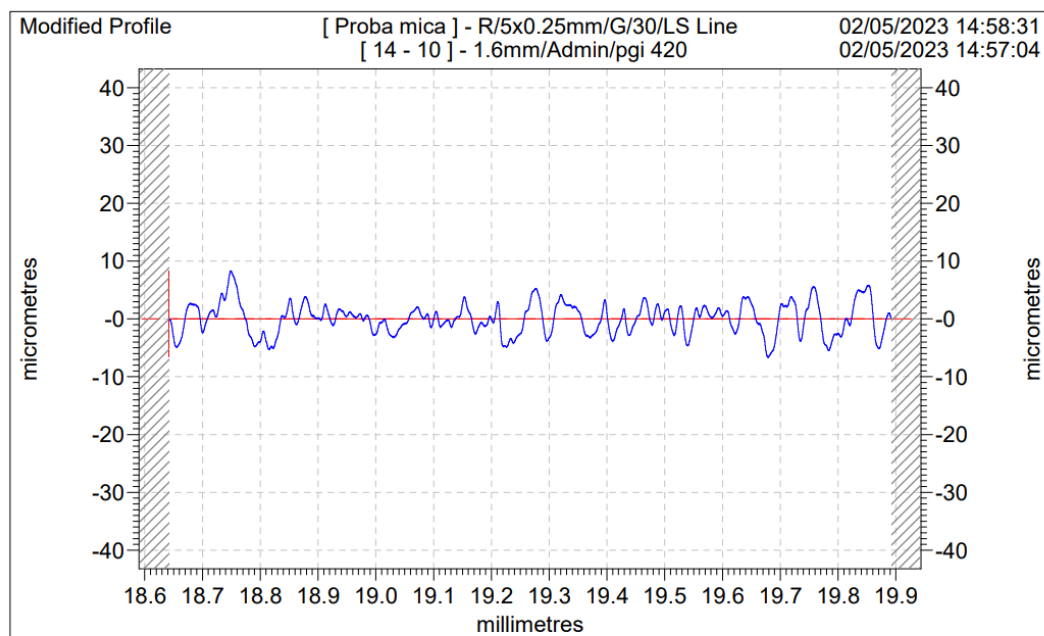
Ra	2.4411	µm
Rz	12.4212	µm
Rt	18.6217	µm

Figure S81. 13-60 Ti



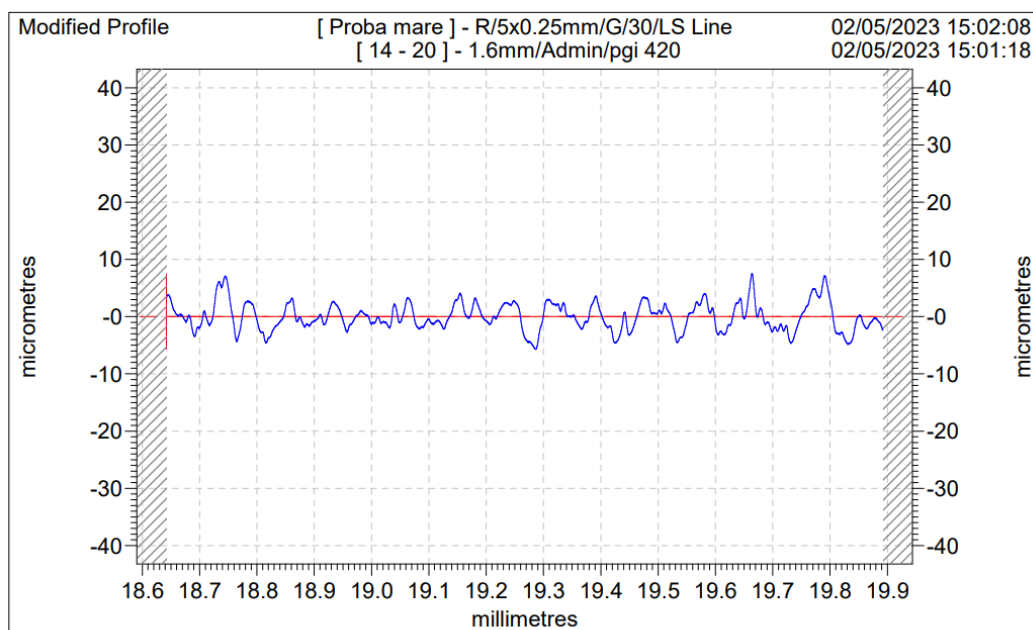
Ra	1.9579	µm
Rz	12.2325	µm
Rt	15.4575	µm

Figure S82. 14-10 Ti4Al6V



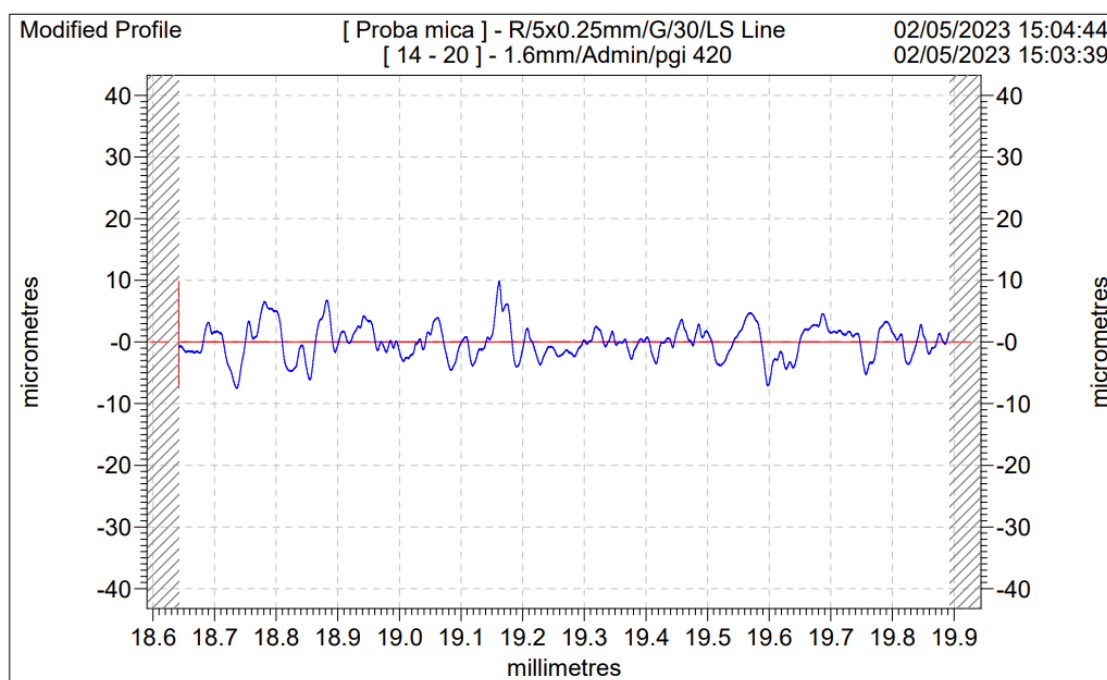
Ra	2.1483	µm
Rz	10.0448	µm
Rt	14.8571	µm

Figure S83. 14-10 Ti



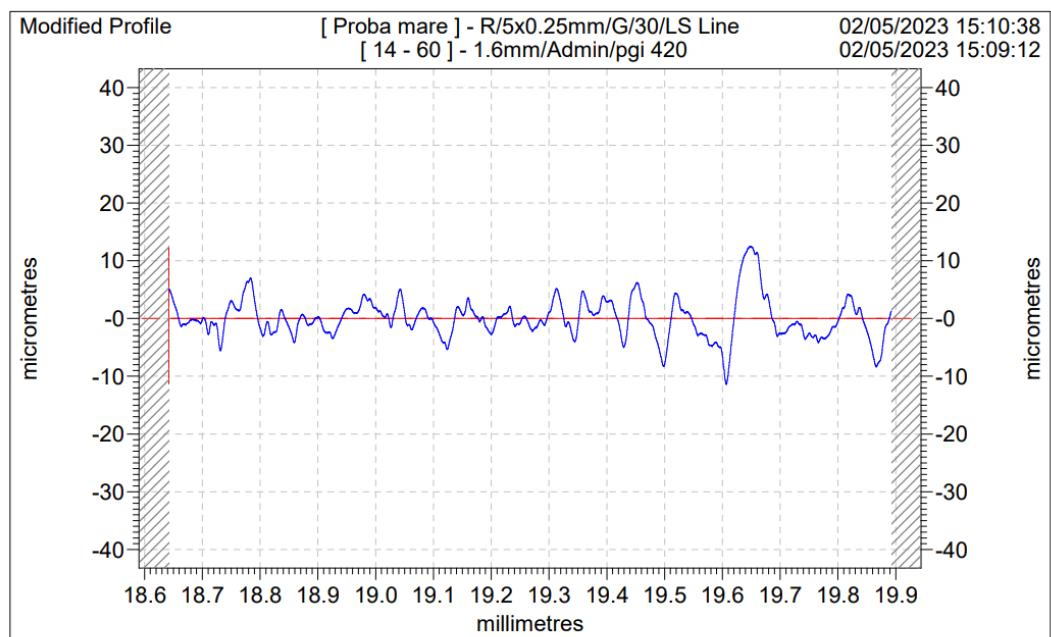
Ra	1.9228	µm
Rz	9.6538	µm
Rt	13.1971	µm

Figure S84. 14-20 Ti4Al6V



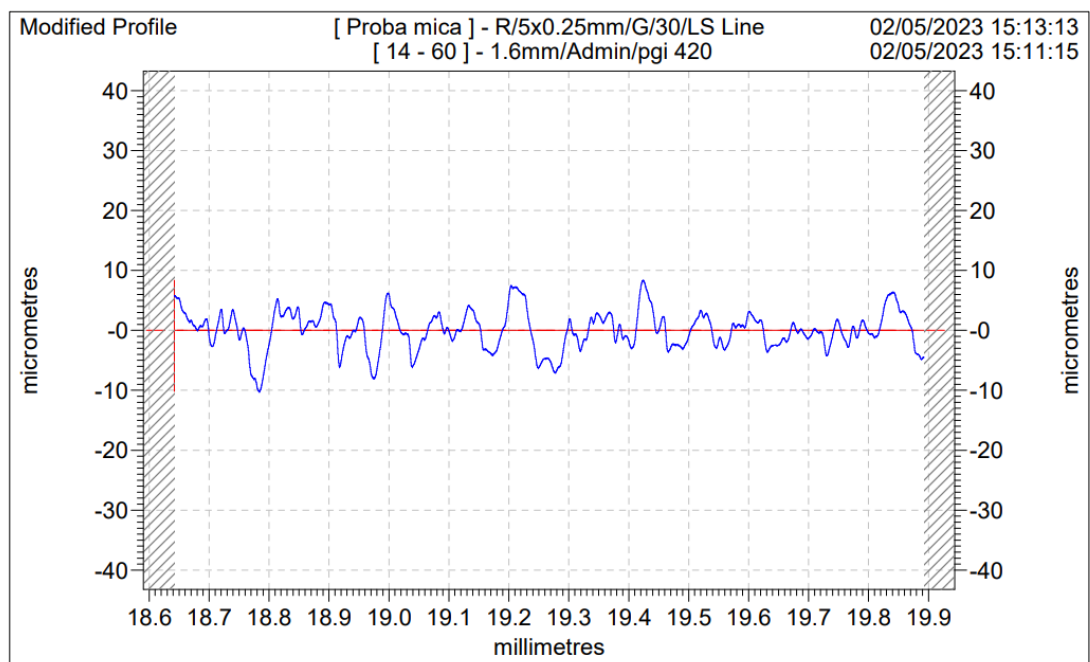
Ra	2.1547	µm
Rz	11.6744	µm
Rt	17.2346	µm

Figure S85. 14-20 Ti



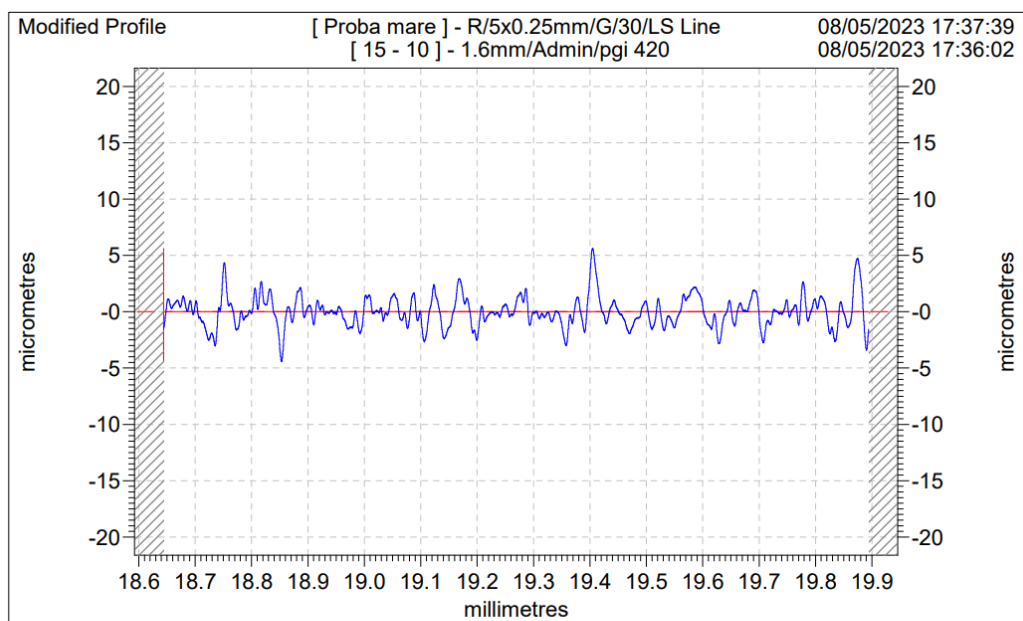
Ra	2.5234	µm
Rz	15.1743	µm
Rt	23.8184	µm

Figure S86. 14-60 Ti4Al6V



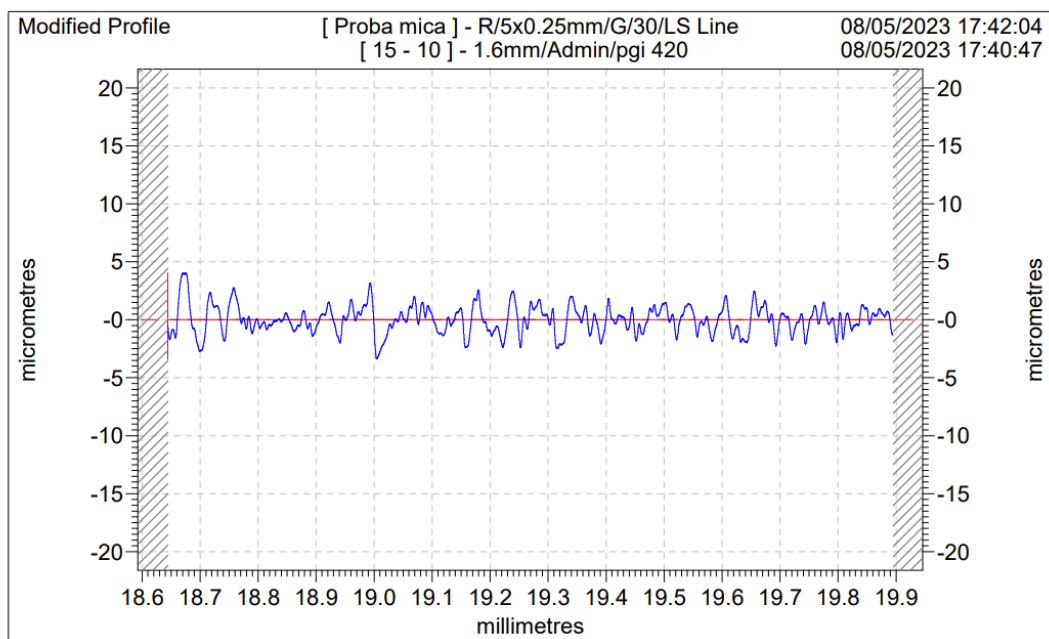
Ra	2.5275	µm
Rz	13.5510	µm
Rt	18.5300	µm

Figure S87. 14-60 Ti



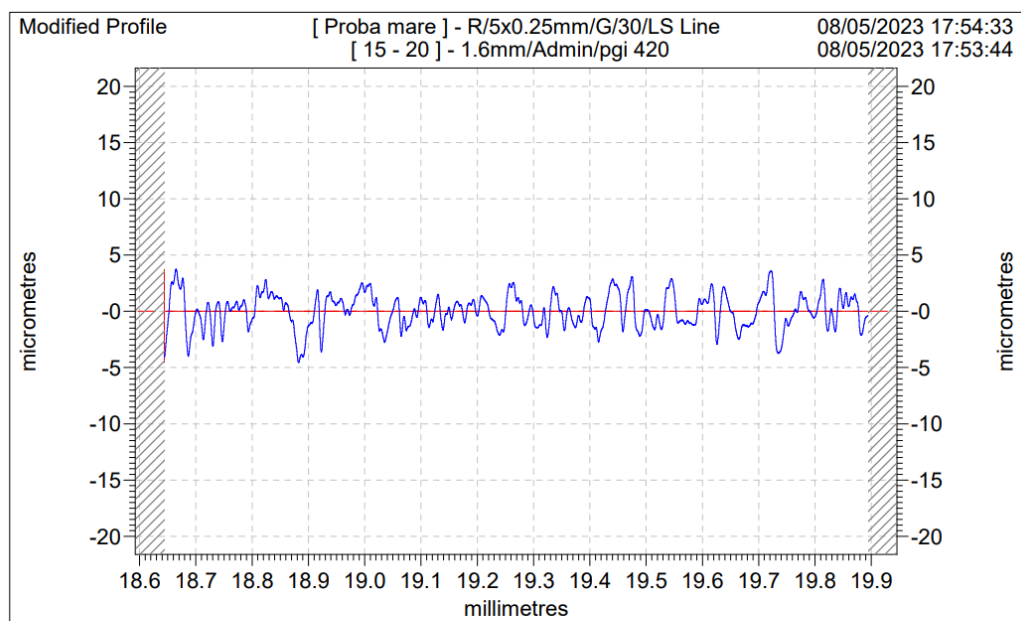
Ra	0.9990	µm
Rz	7.2508	µm
Rt	10.0527	µm

Figure S88. 15-10 Ti4Al6V



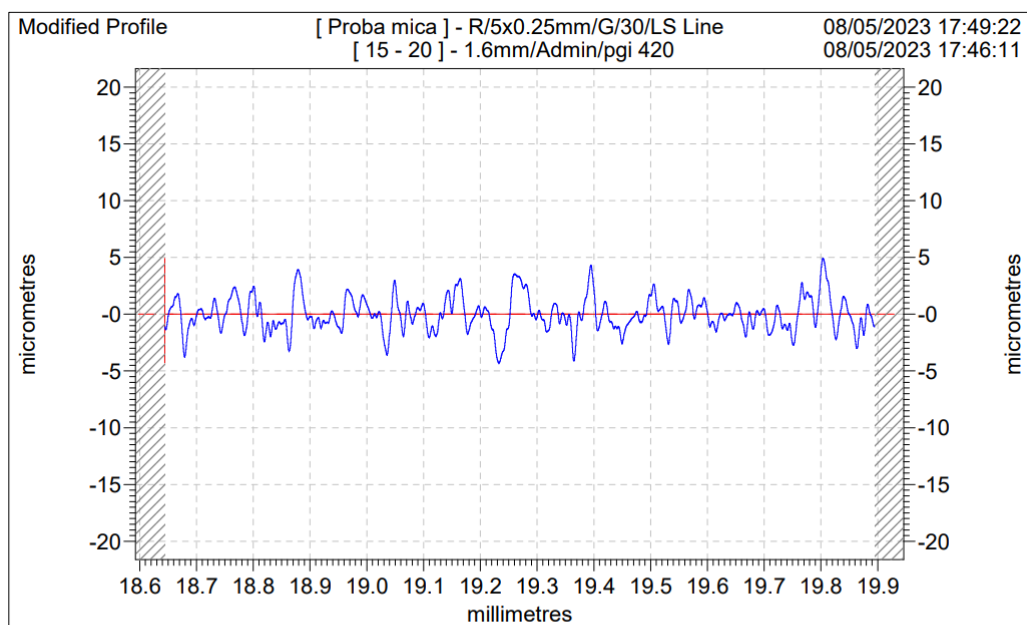
Ra	0.9317	µm
Rz	5.3976	µm
Rt	7.3963	µm

Figure S89. 15-10 Ti



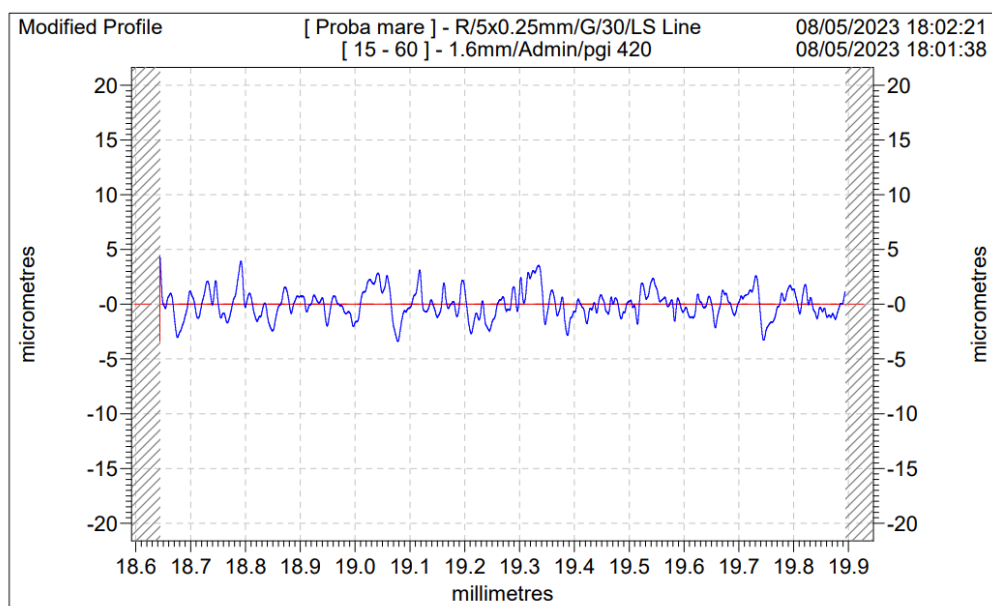
Ra	1.2356	µm
Rz	6.5049	µm
Rt	8.2973	µm

Figure S90. 15-20 Ti4Al6V



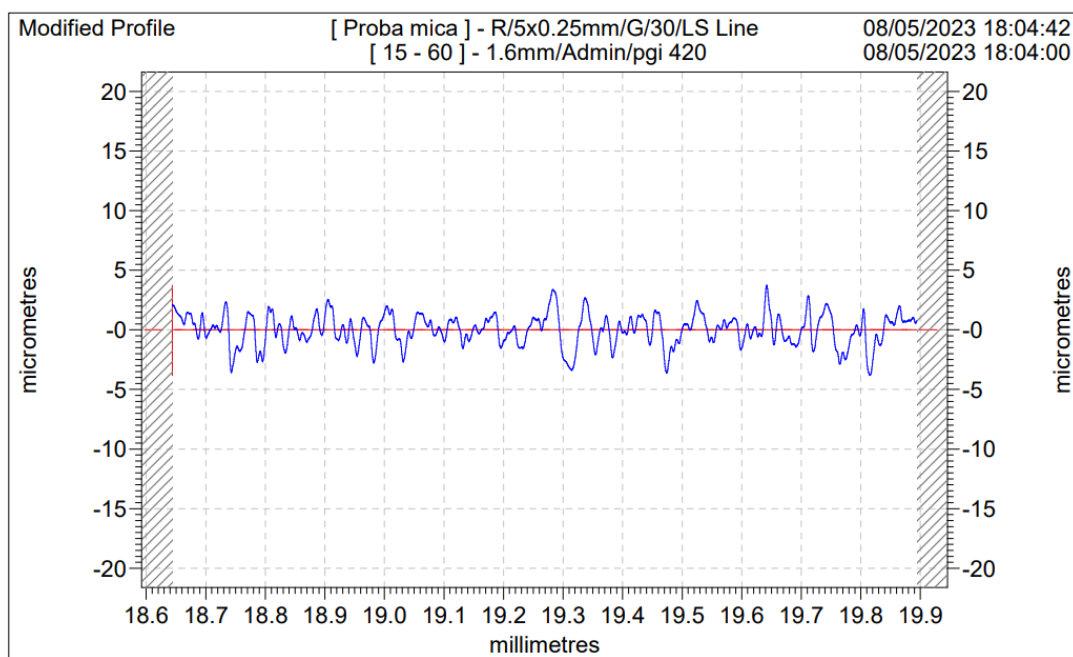
Ra	1.1485	µm
Rz	7.5206	µm
Rt	9.2144	µm

Figure S91. 15-20 Ti



Ra	1.0039	µm
Rz	6.0882	µm
Rt	7.8509	µm

Figure S92. 15-60 Ti4Al6V



Ra	1.0423	µm
Rz	6.4282	µm
Rt	7.5433	µm

Figure S93. 15-60 Ti

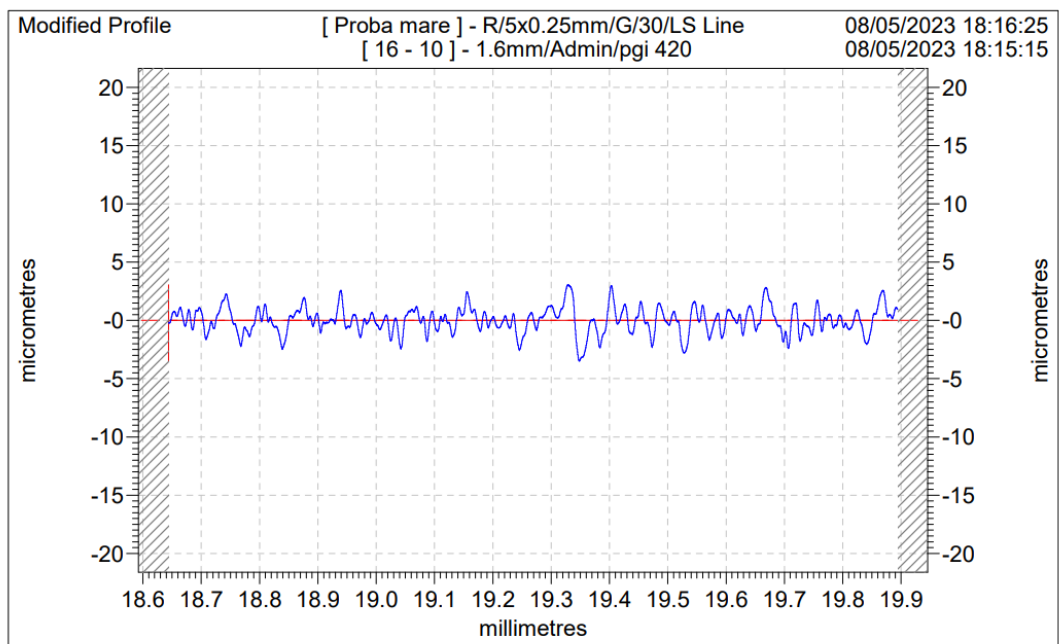


Figure S94. 16-10 Ti4Al6V

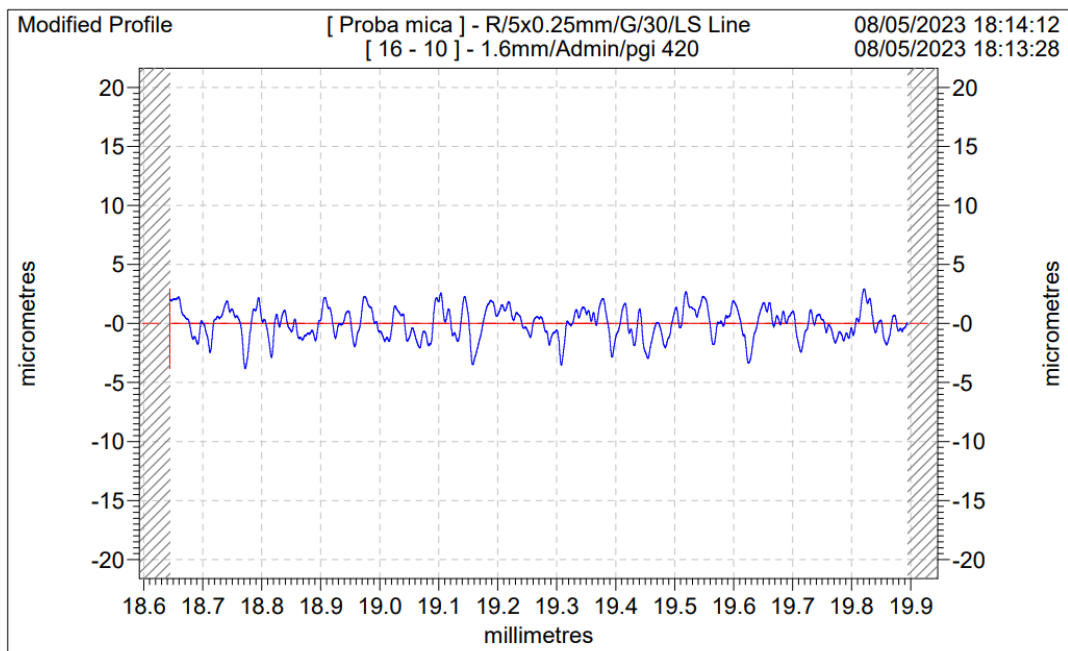
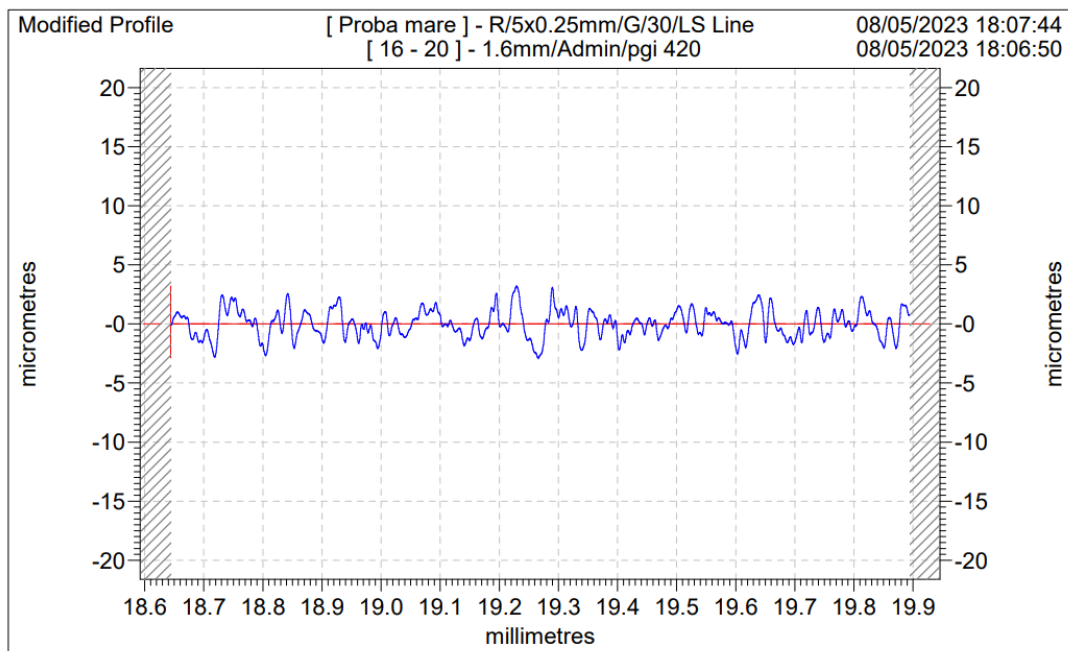
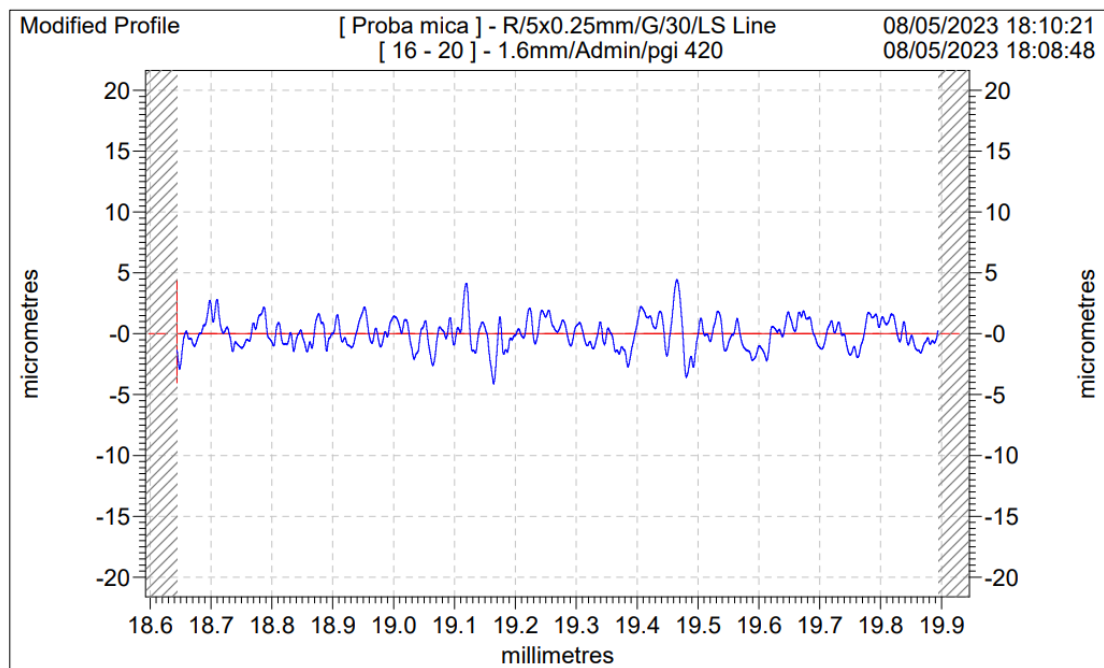


Figure S95. 16-10 Ti



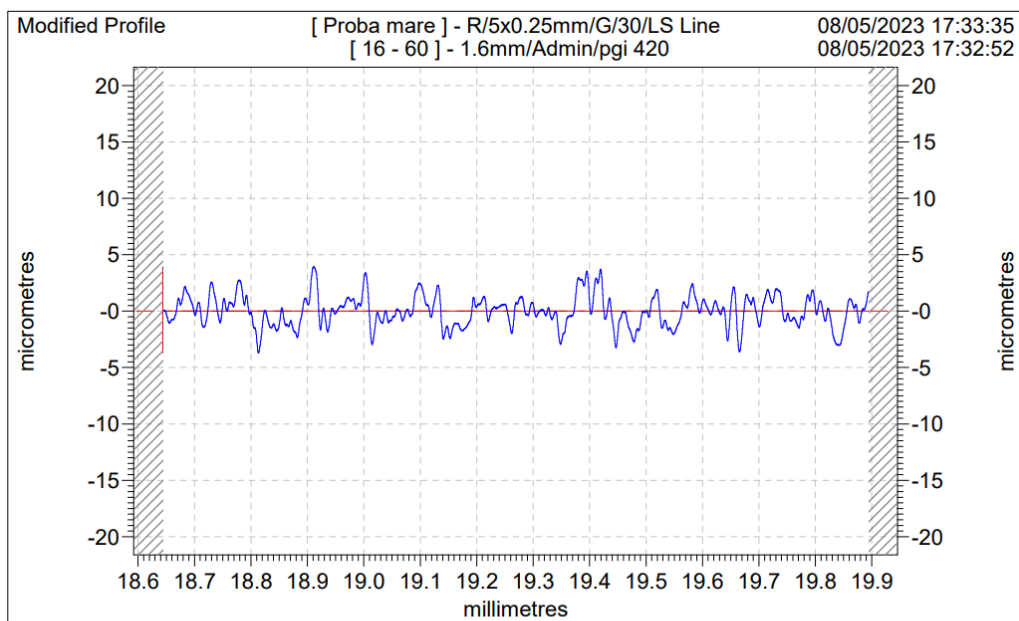
Ra	0.9462	µm
Rz	5.0264	µm
Rt	6.0809	µm

Figure S96. 16-20 Ti4Al6V



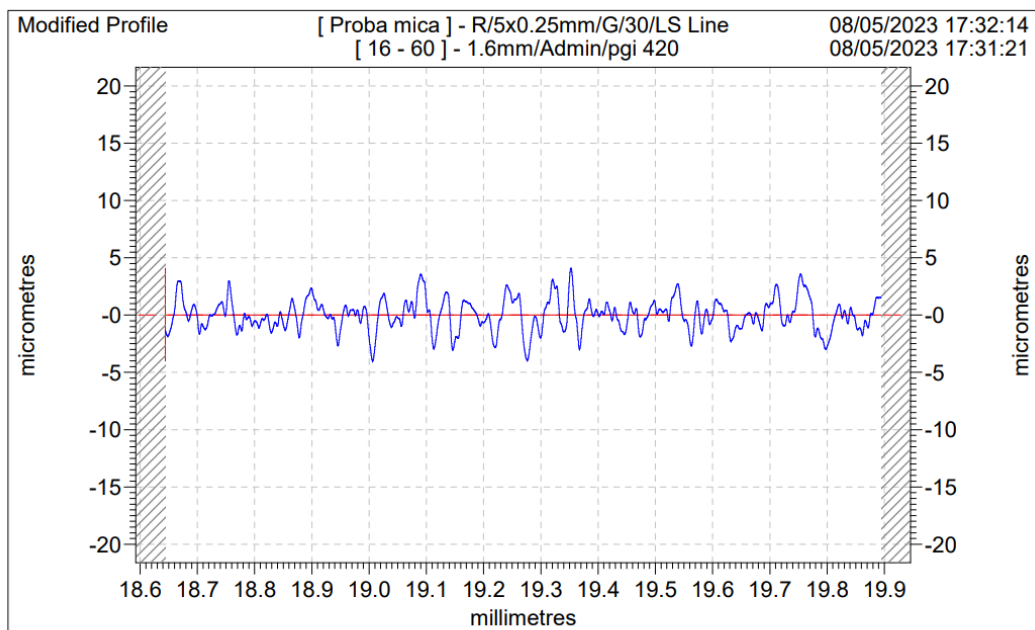
Ra	0.9881	µm
Rz	6.0616	µm
Rt	8.4897	µm

Figure S97. 16-20 Ti



Ra	1.0707	µm
Rz	6.4333	µm
Rt	7.6169	µm

Figure S98. 16-260 Ti4Al6V



Ra	1.0627	µm
Rz	6.5143	µm
Rt	8.1040	µm

Figure S99. 16-60 Ti

Figures S100–S104 Depiction of the replicated samples for sandblasting.

The support, the attachment with double adhesive band, series of triplicates for Ti and triplicates for Ti alloy blasted at the same time under the very same conditions, the storage system for further analysis



Figure S100. system for attaching the samples, in the absence of samples



Figure S101. Triplicates of Ti and Ti alloy before blasting



Figure S102. Triplicates of Ti and Ti alloy before blasting

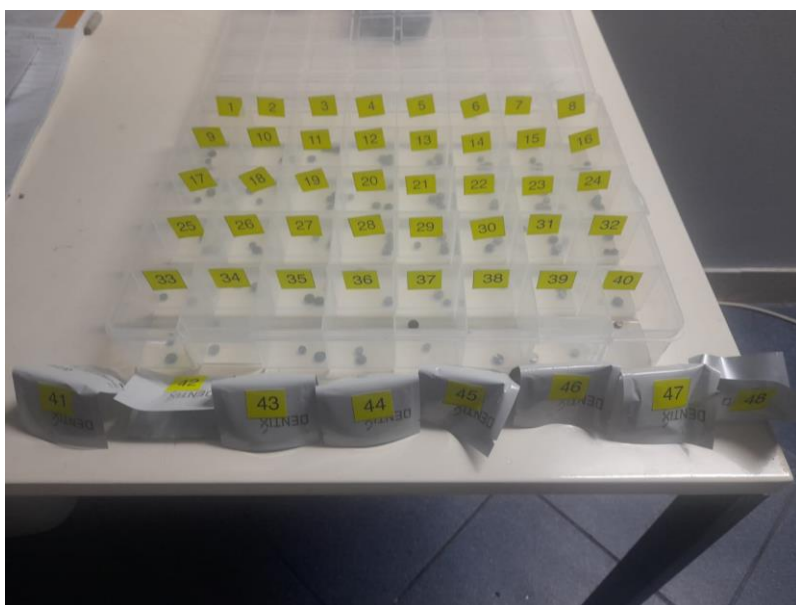


Figure S103. Storage system for sandblasted probes before sending them to analysis



Figure S104. Detail of the storage system for sandblasted probes