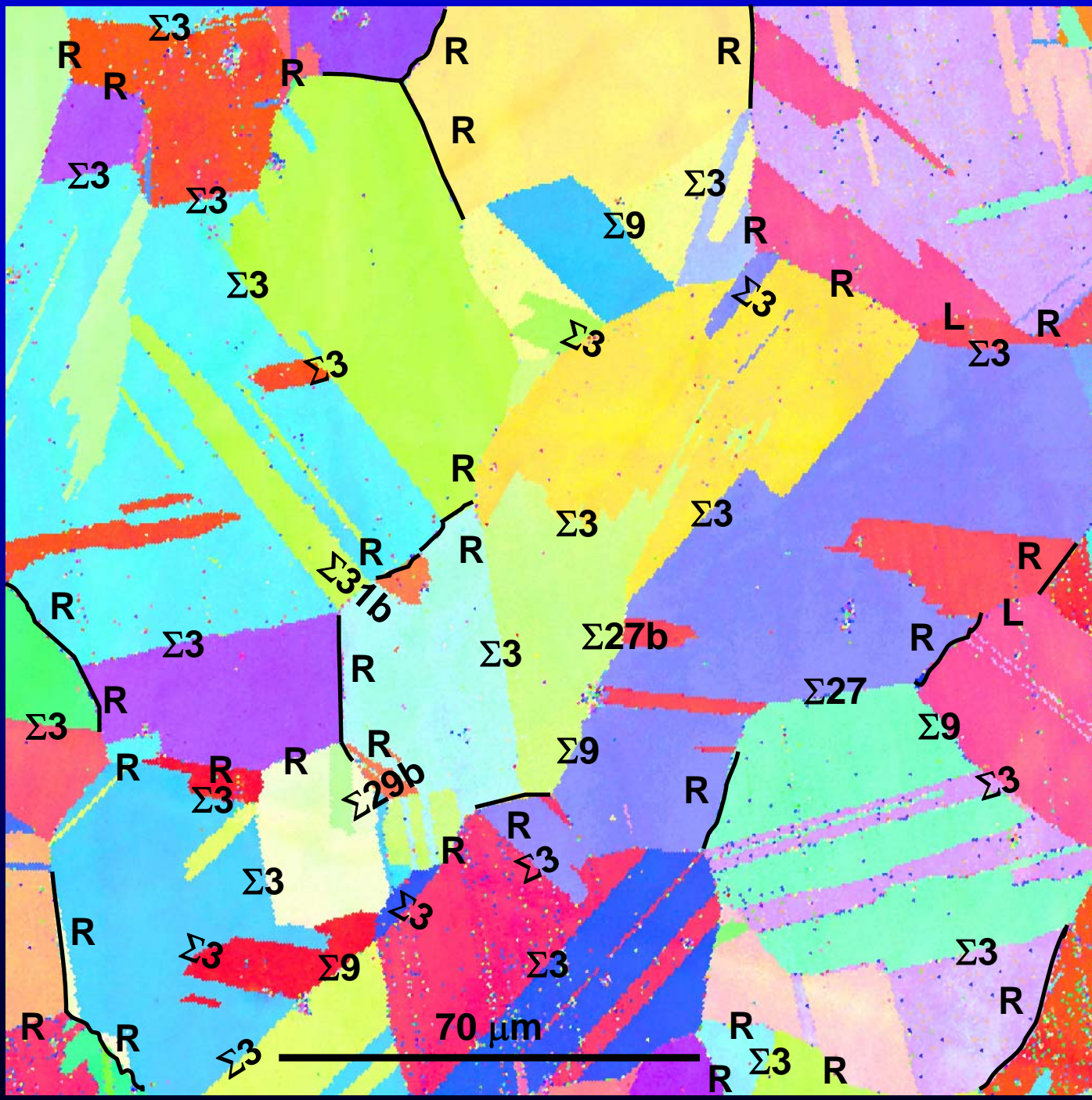


# KEY

- R – Random Boundary
- L – Low Angle Boundary
- $\Sigma$  – Special Boundary



Crept 10% cold rolled specimen indicating the boundaries which cracked during the experiment (overlaid black lines). Several of the grain boundaries are labeled showing that cracks tended to form on the GHABs. The loading axis was horizontal.



Acc.V Spot Magn  
30.0 kV 6.0 1000x

Det WD  
SE 30.1

50  $\mu$ m

0.2642 mm



Acc.V 30.0 kV Spot 6.0 Magn 1000x Det SE WD 30.1 50 μm

0.2870 mm



Acc.V Spot Magn Det WD |-----| 50 µm  
30.0 kV 6.0 1000x SE 30.1

0.3099 mm



Acc.V Spot Magn Det WD  
30.0 kV 6.0 1000x SE 30.1

50 μm

0.3708 mm



Acc.V 30.0 kV  
Spot 6.0  
Magn 899x

Det SE  
WD 30.1

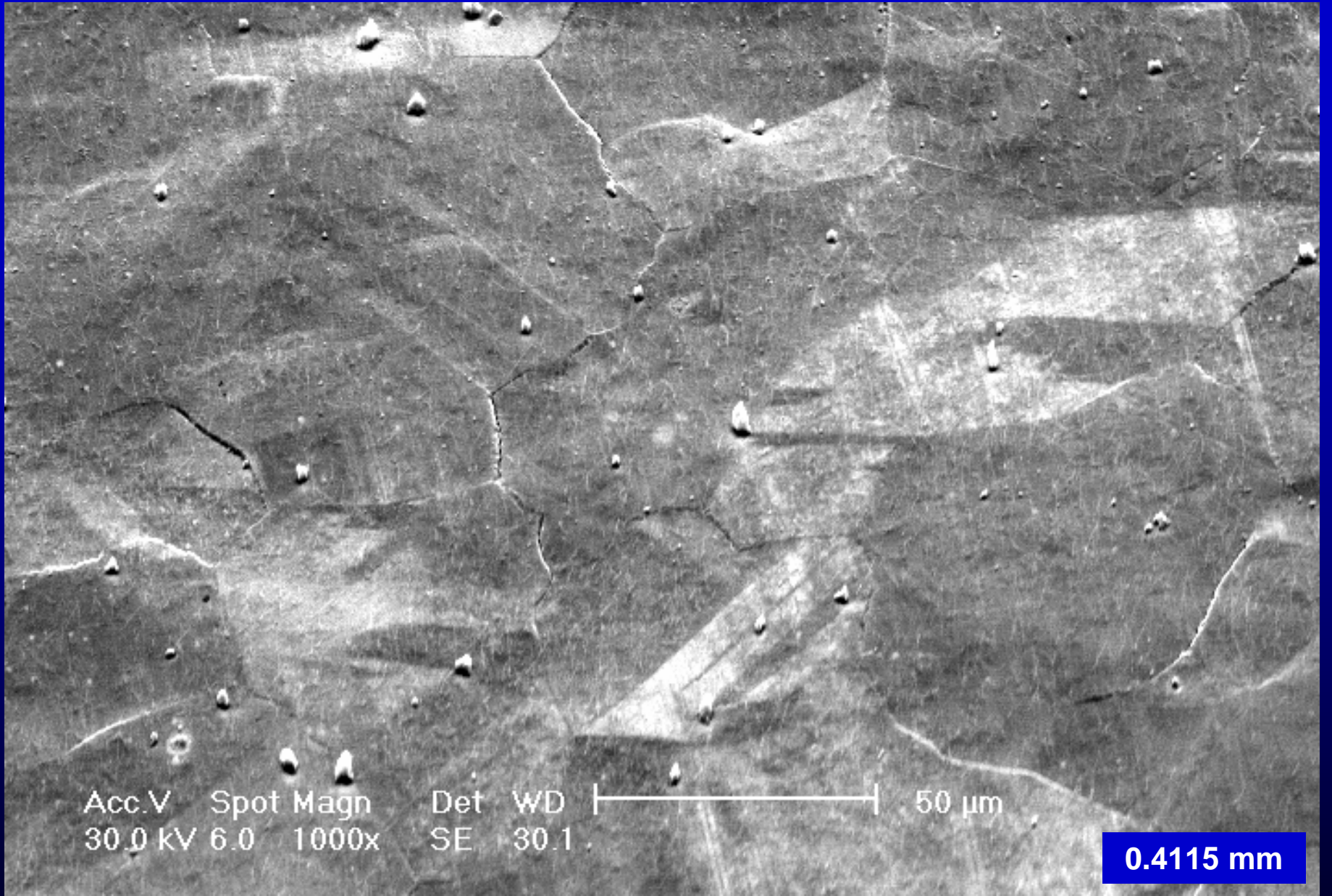
50 μm

0.3912 mm



Acc.V Spot Magn Det WD |-----| 50 μm  
30.0 kV 6.0 1000x SE 30.1

0.3962 mm



Acc.V Spot Magn Det WD |-----| 50  $\mu$ m  
30.0 kV 6.0 1000x SE 30.1

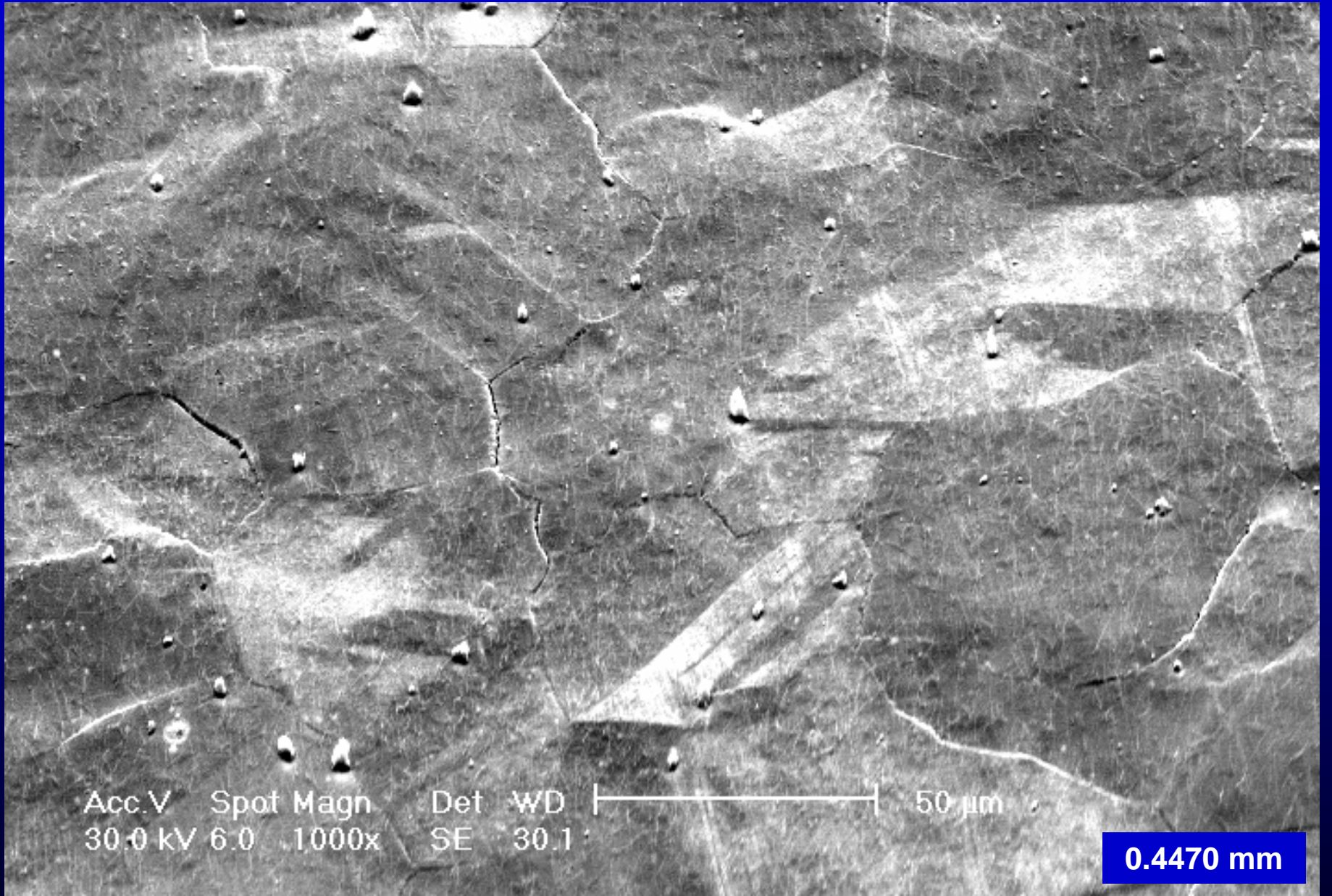
0.4115 mm





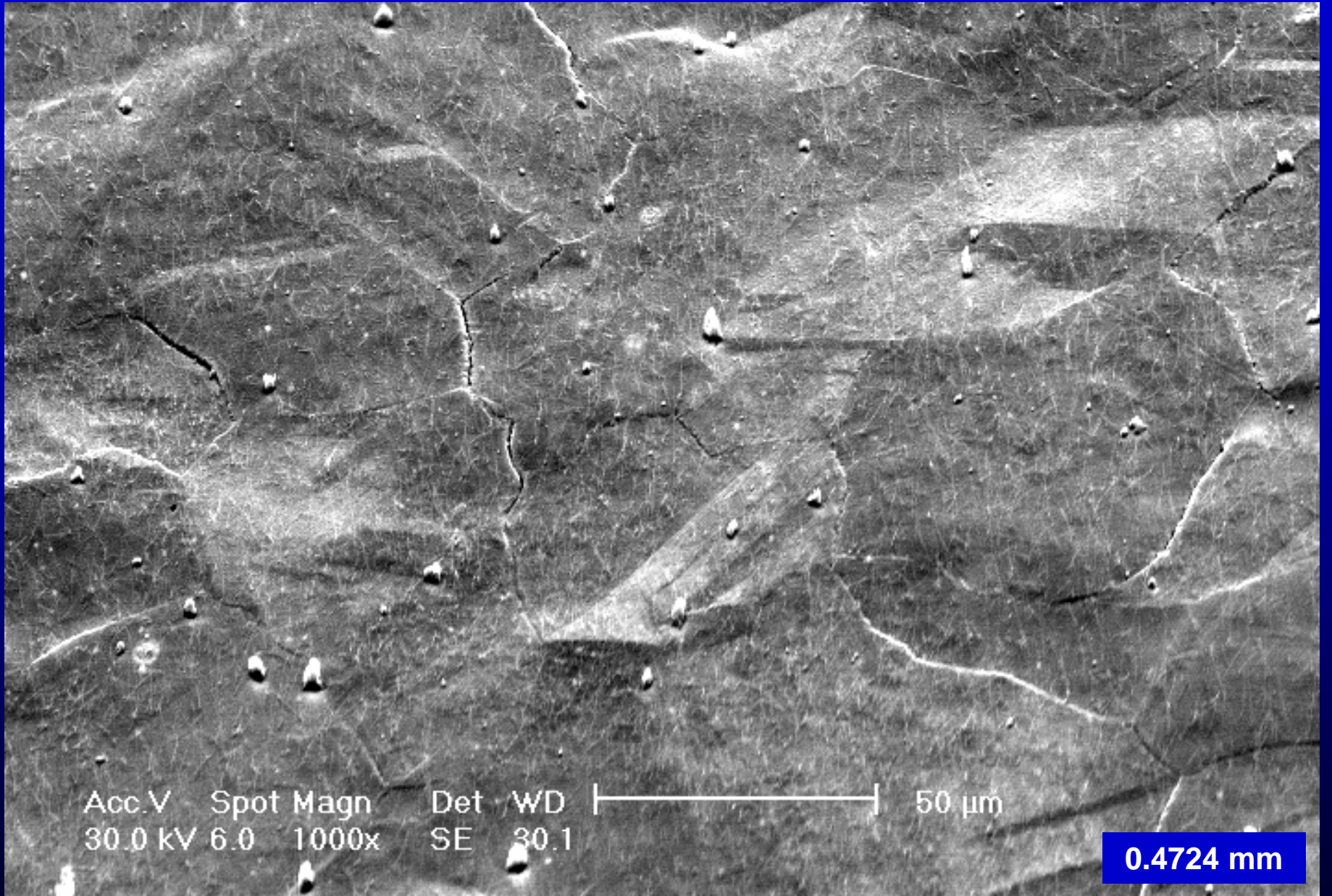
Acc.V Spot Magn Det WD |-----| 50  $\mu$ m  
30.0 kV 6.0 1000x SE 30.1

0.4369 mm



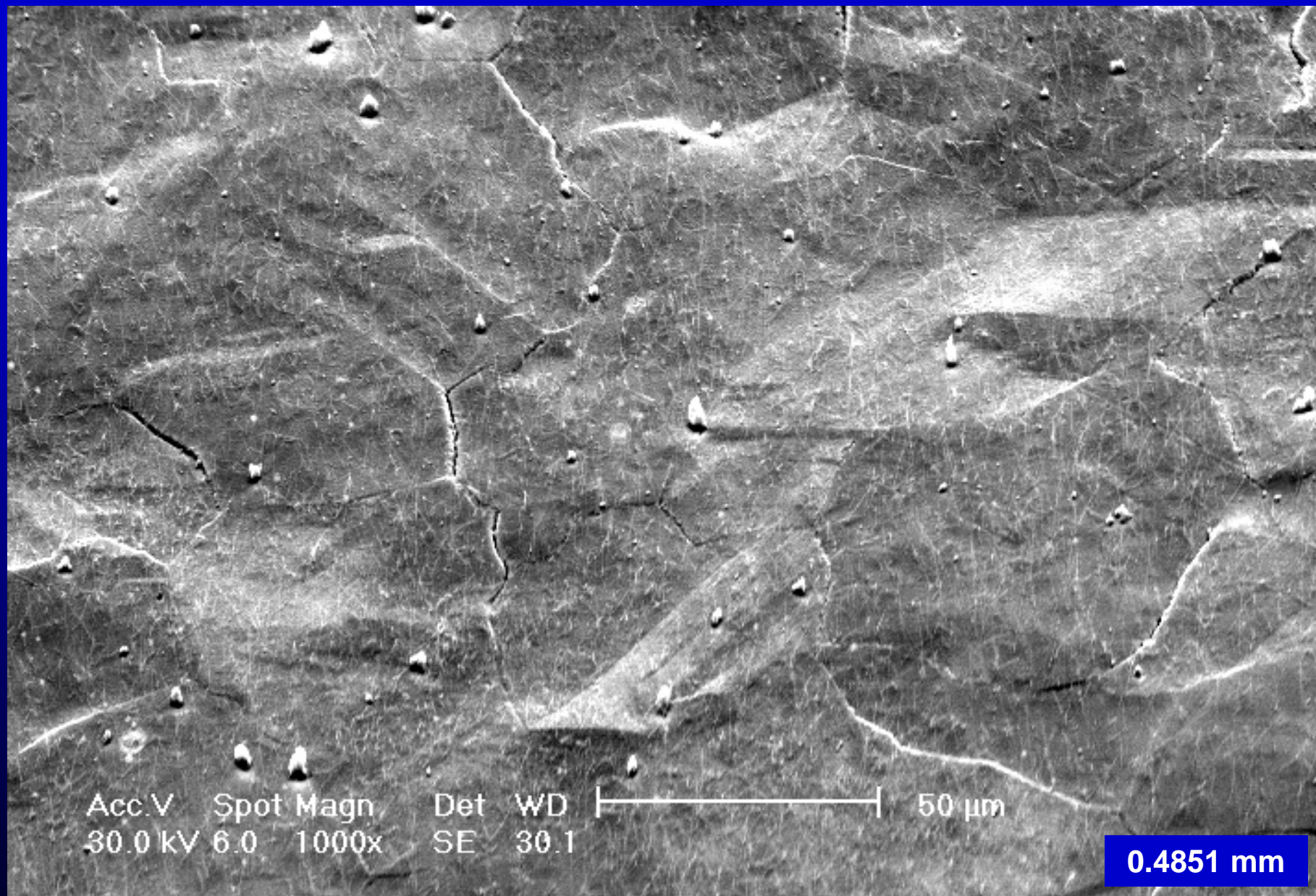
Acc.V Spot Magn Det WD |-----| 50  $\mu$ m  
30.0 kV 6.0 1000x SE 30.1

0.4470 mm



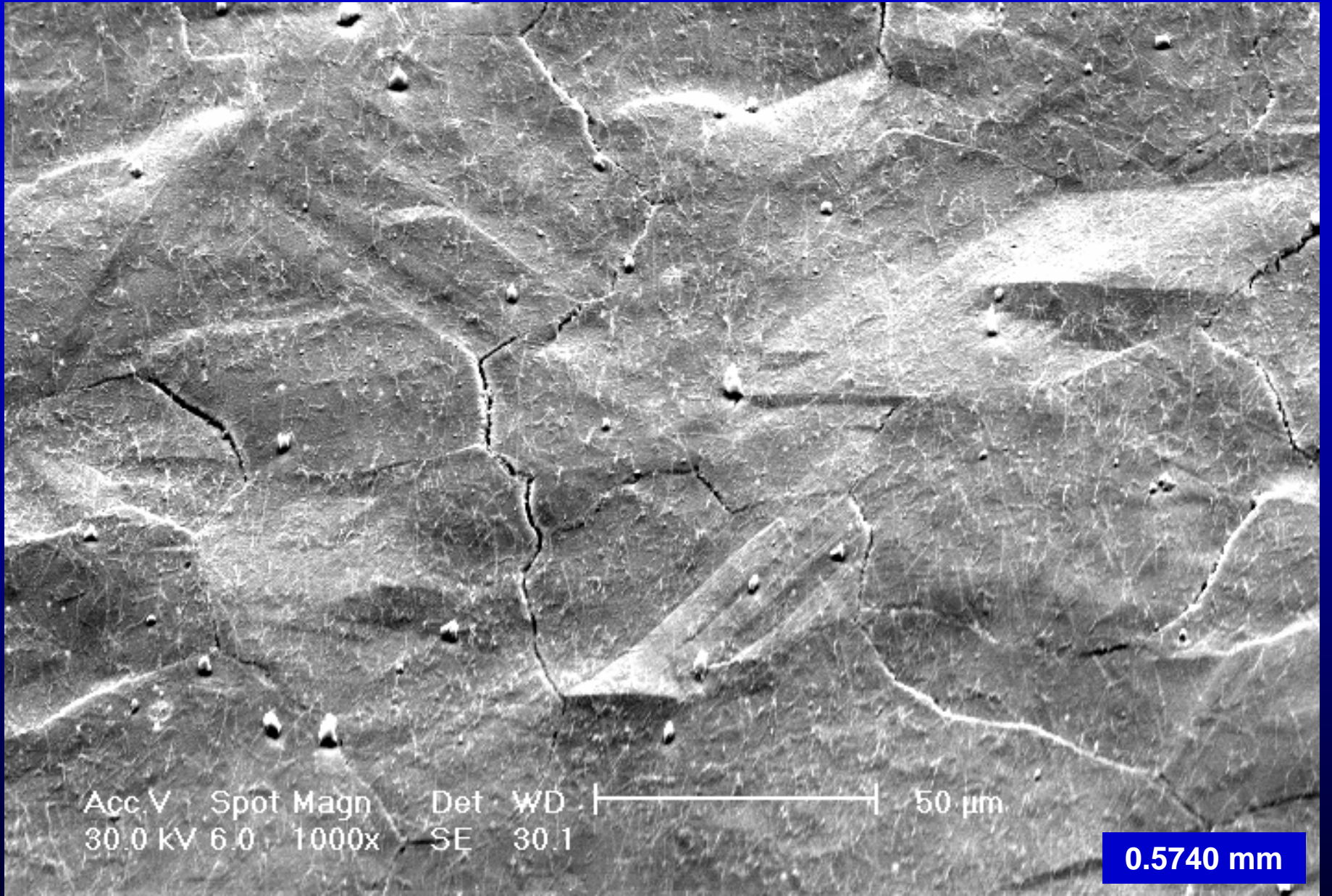
Acc.V Spot Magn Det WD |-----| 50 μm  
30.0 kV 6.0 1000x SE 30.1

0.4724 mm



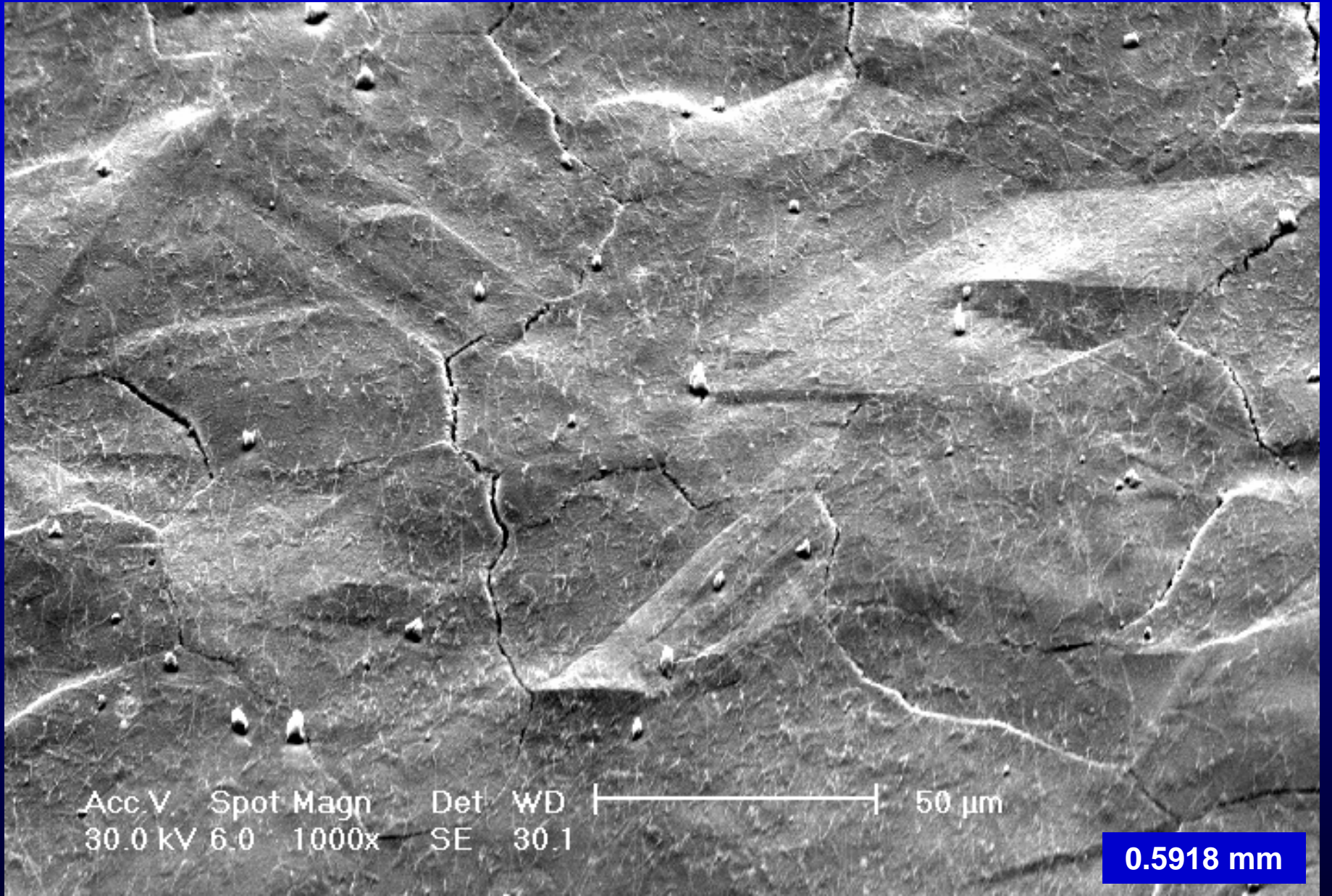
Acc.V Spot Magn Det WD |-----| 50  $\mu$ m  
30.0 kV 6.0 1000x SE 30.1

0.4851 mm



Acc.V Spot Magn Det WD |-----| 50  $\mu$ m  
30.0 kV 6.0 1000x SE 30.1

0.5740 mm



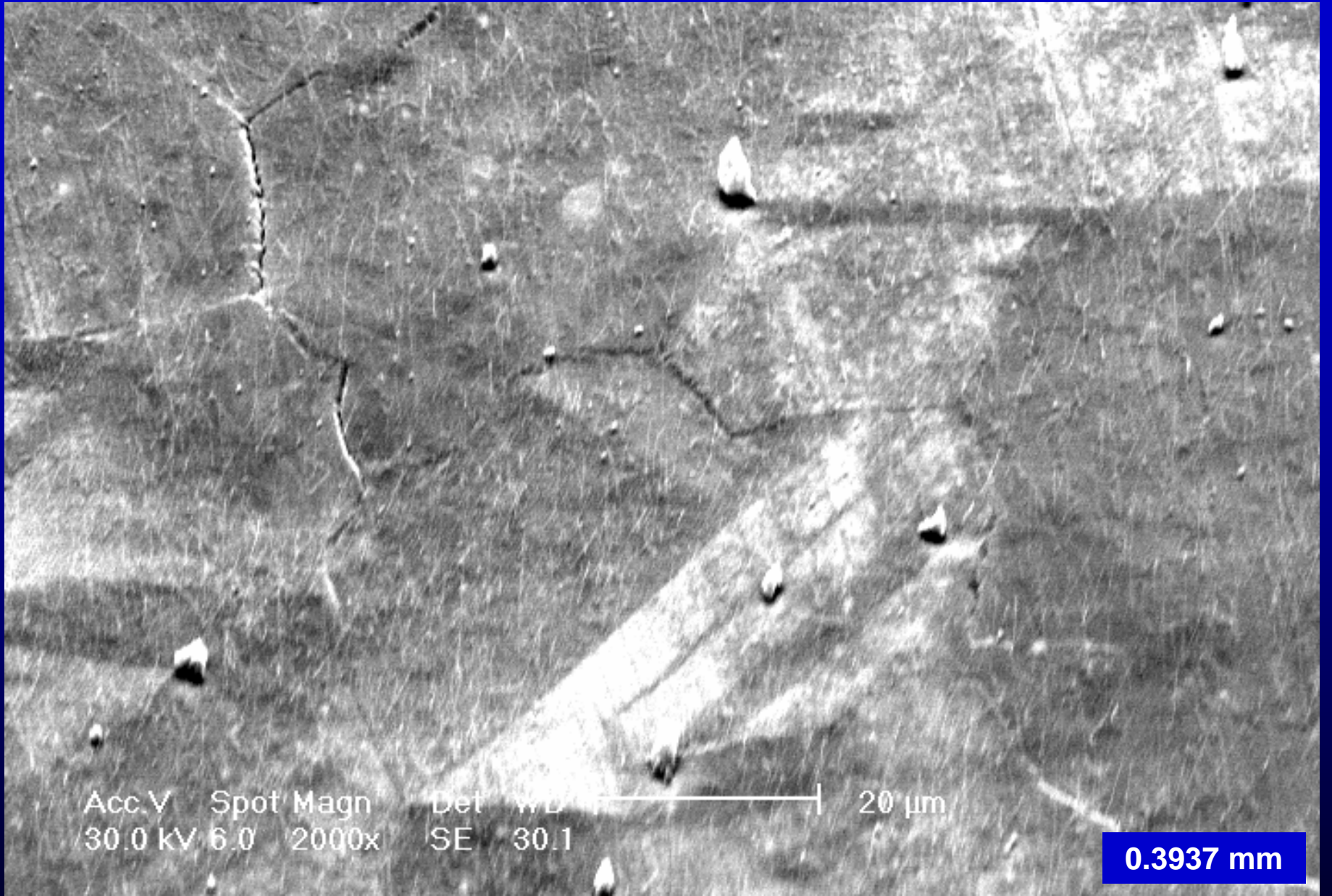
Acc.V Spot Magn Det WD |-----| 50  $\mu$ m  
30.0 kV 6.0 1000x SE 30.1

0.5918 mm



Acc.V 30.0 kV Spot 6.0 Magn 2000x Det SE 30.1 20 μm

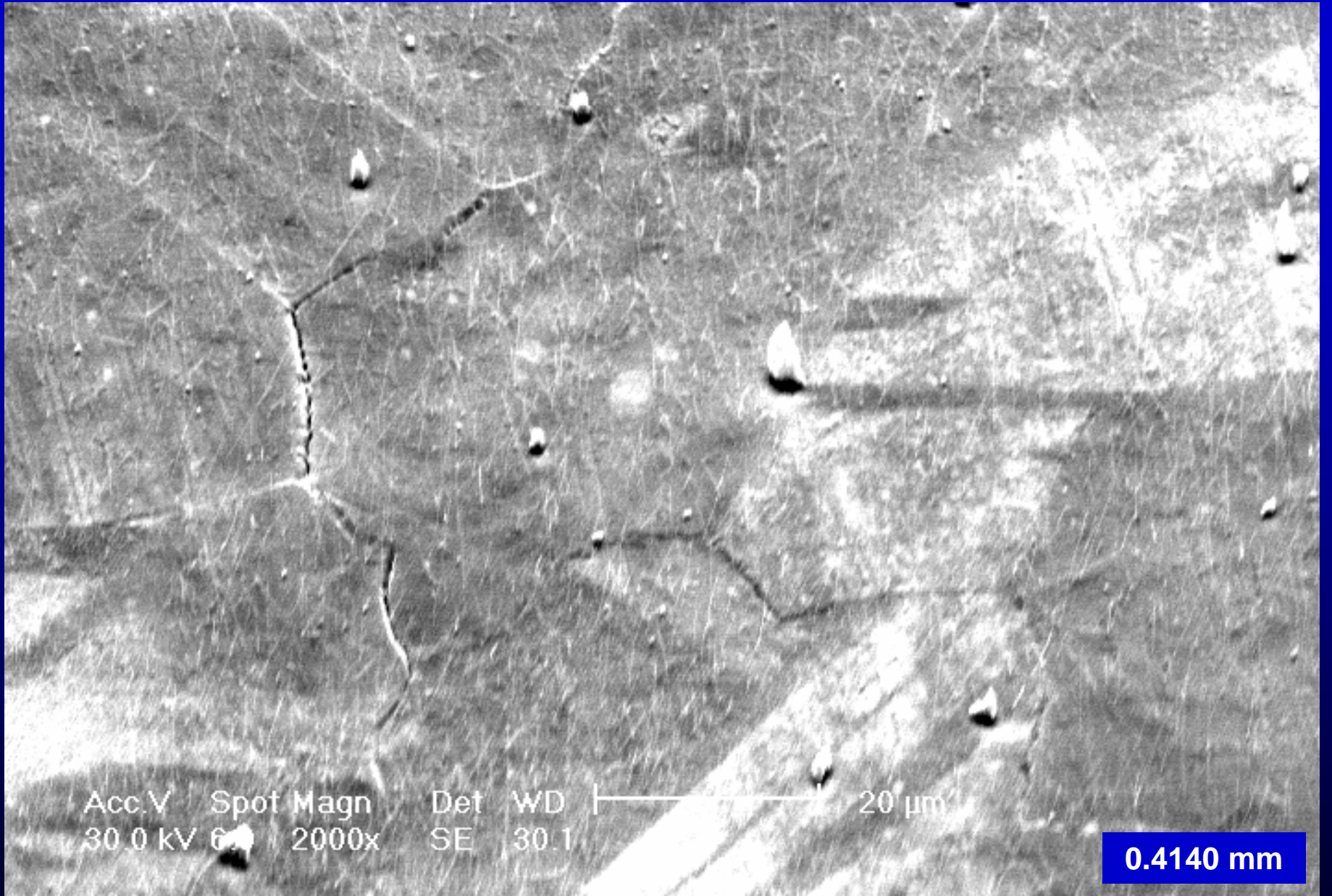
0.3708 mm



Acc.V Spot Magn Det WD |-----| 20  $\mu$ m  
30.0 kV 6.0 2000x SE 30.1

0.3937 mm



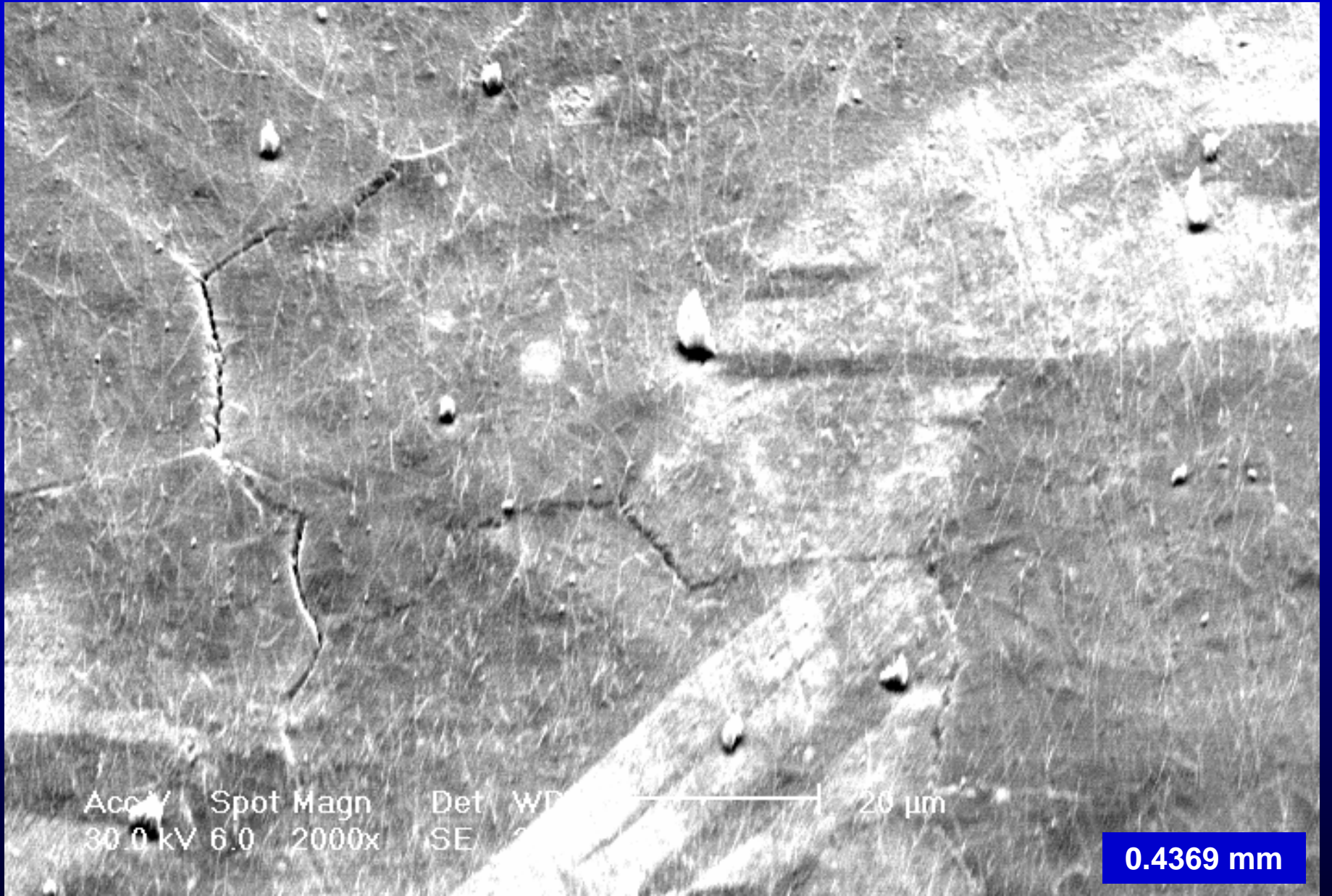


Acc.V Spot Magn  
30.0 kV 6.0 2000x

Det WD  
SE 30.1

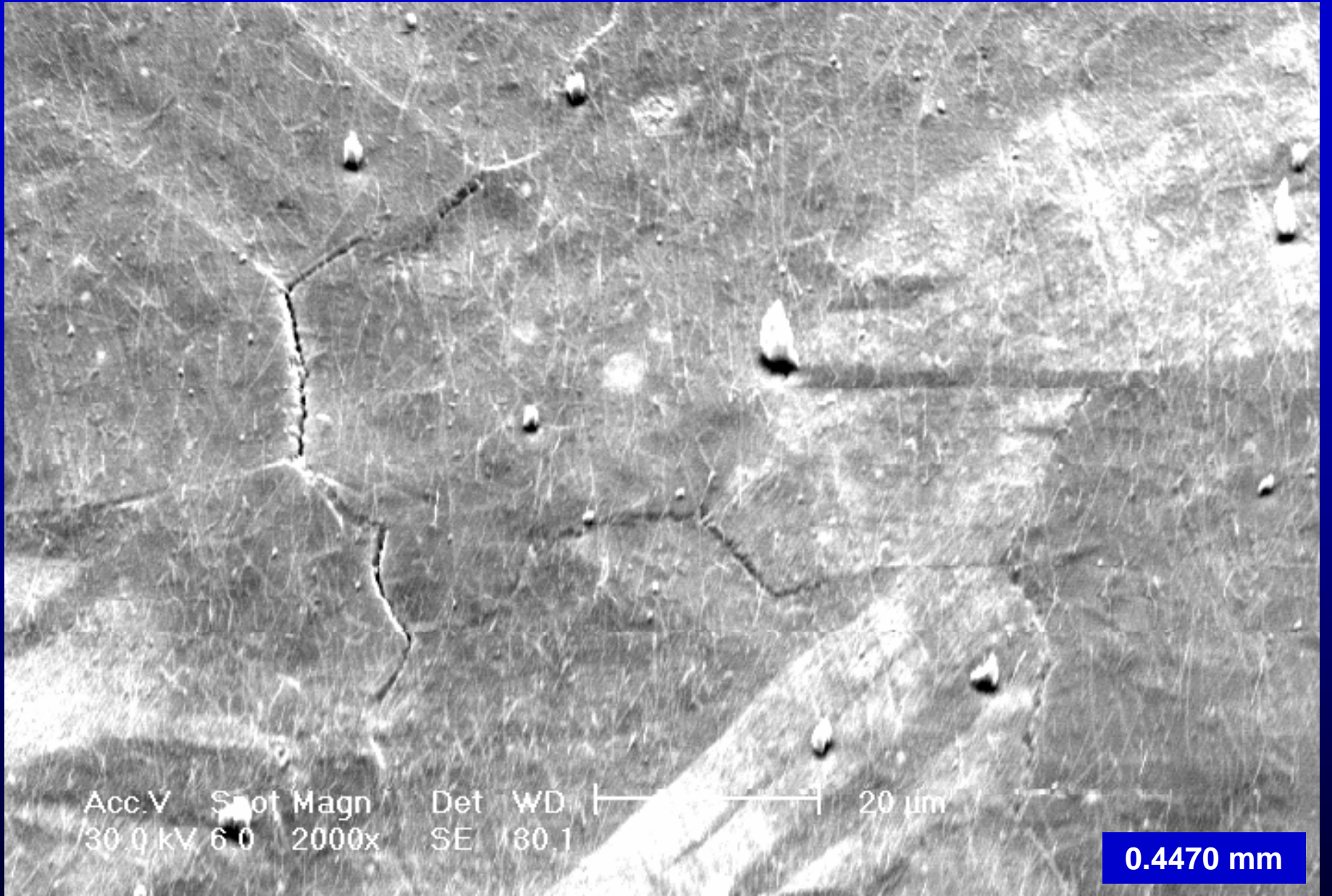
20  $\mu$ m

0.4140 mm



Acc 30.0 kV Spot Magn 6.0 / 2000x Det SE WD 20 μm

0.4369 mm



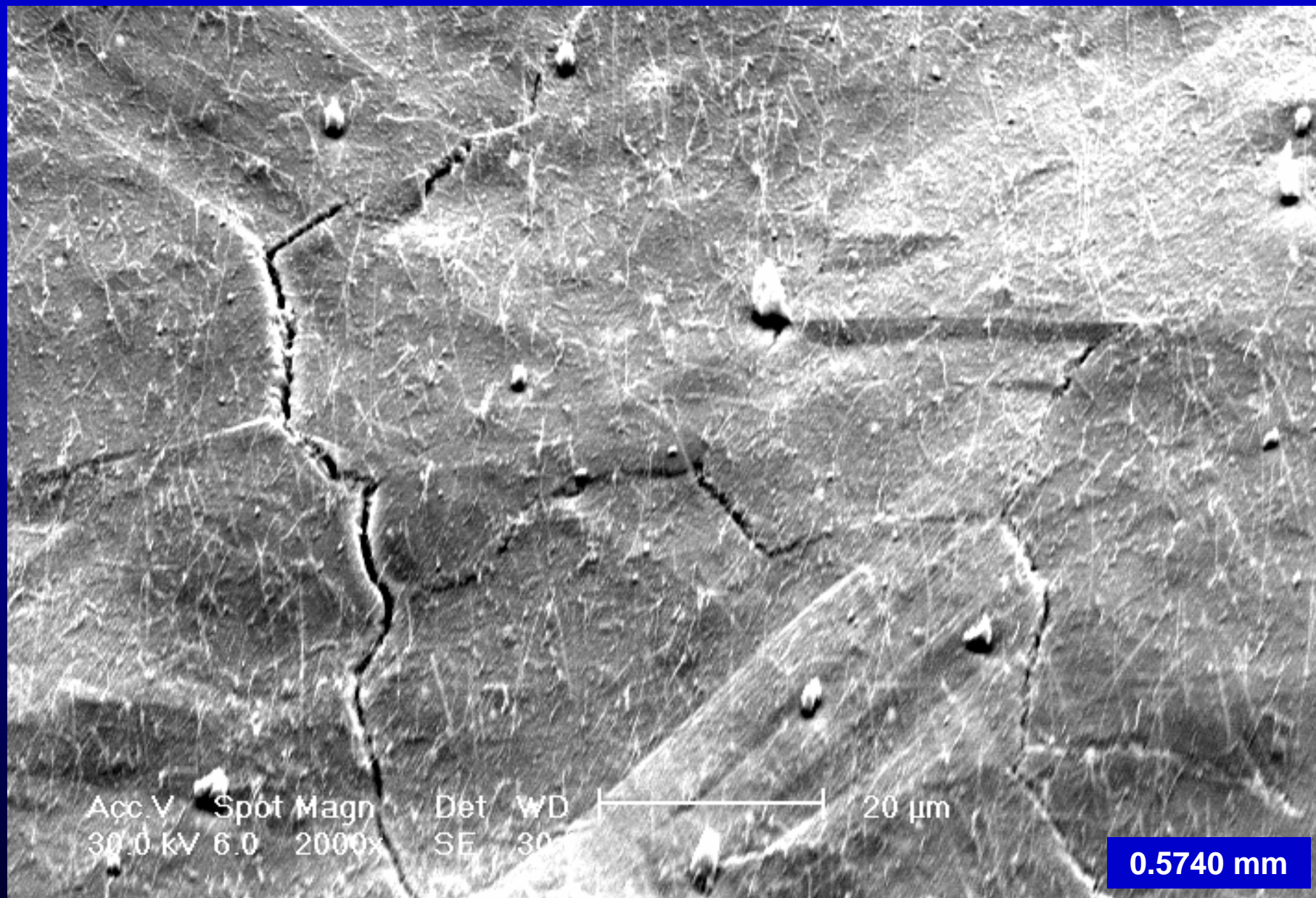
Acc.V 30.0 kV Spot 6.0 Magn 2000x Det SE WD 180.1 |-----| 20  $\mu$ m

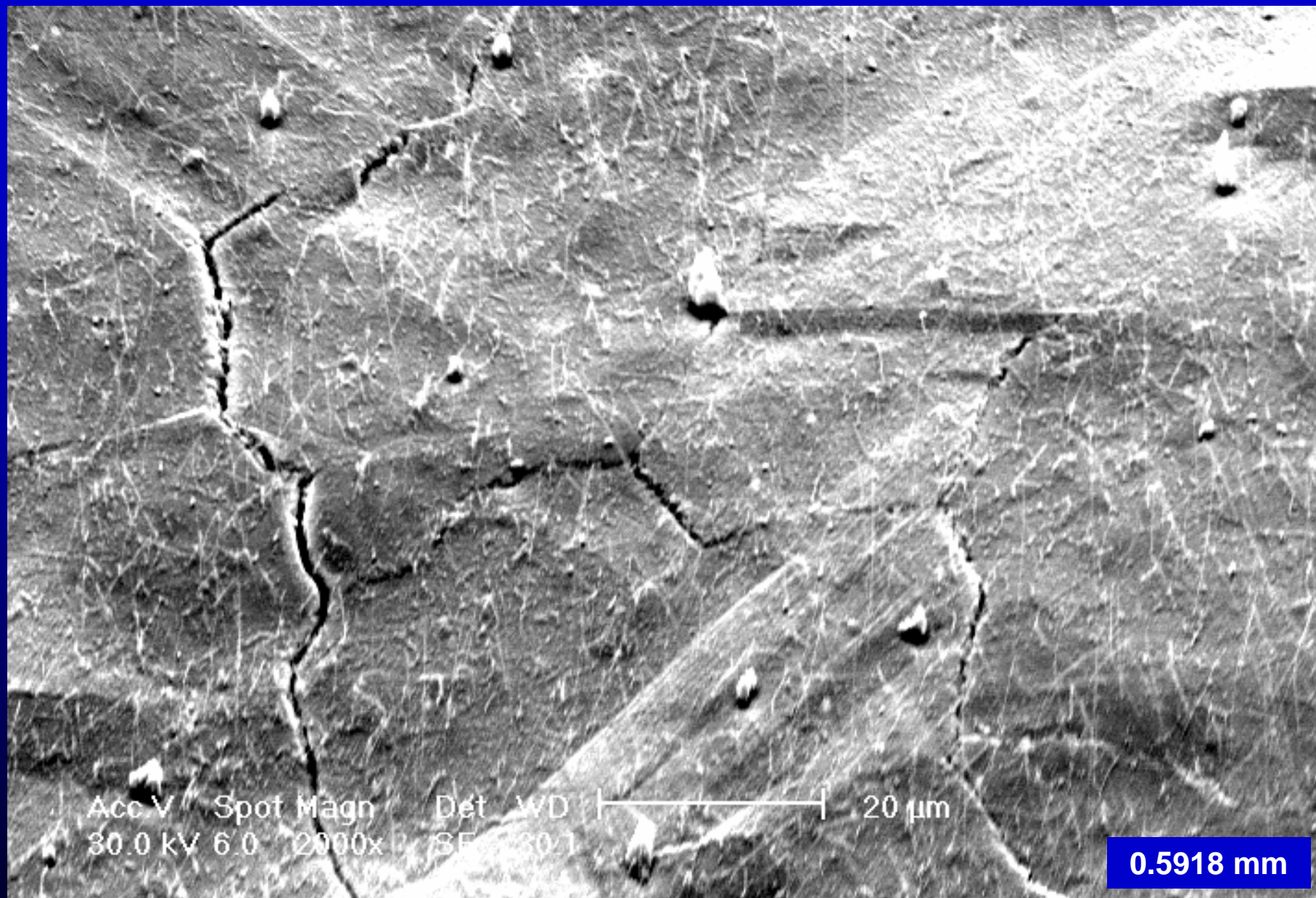
0.4470 mm



Acc V Spot Magn Det 30.1 | 20  $\mu$ m  
30.0 kV 6.0 2000x SE 30.1

0.4724 mm

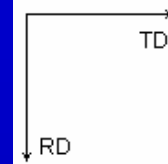
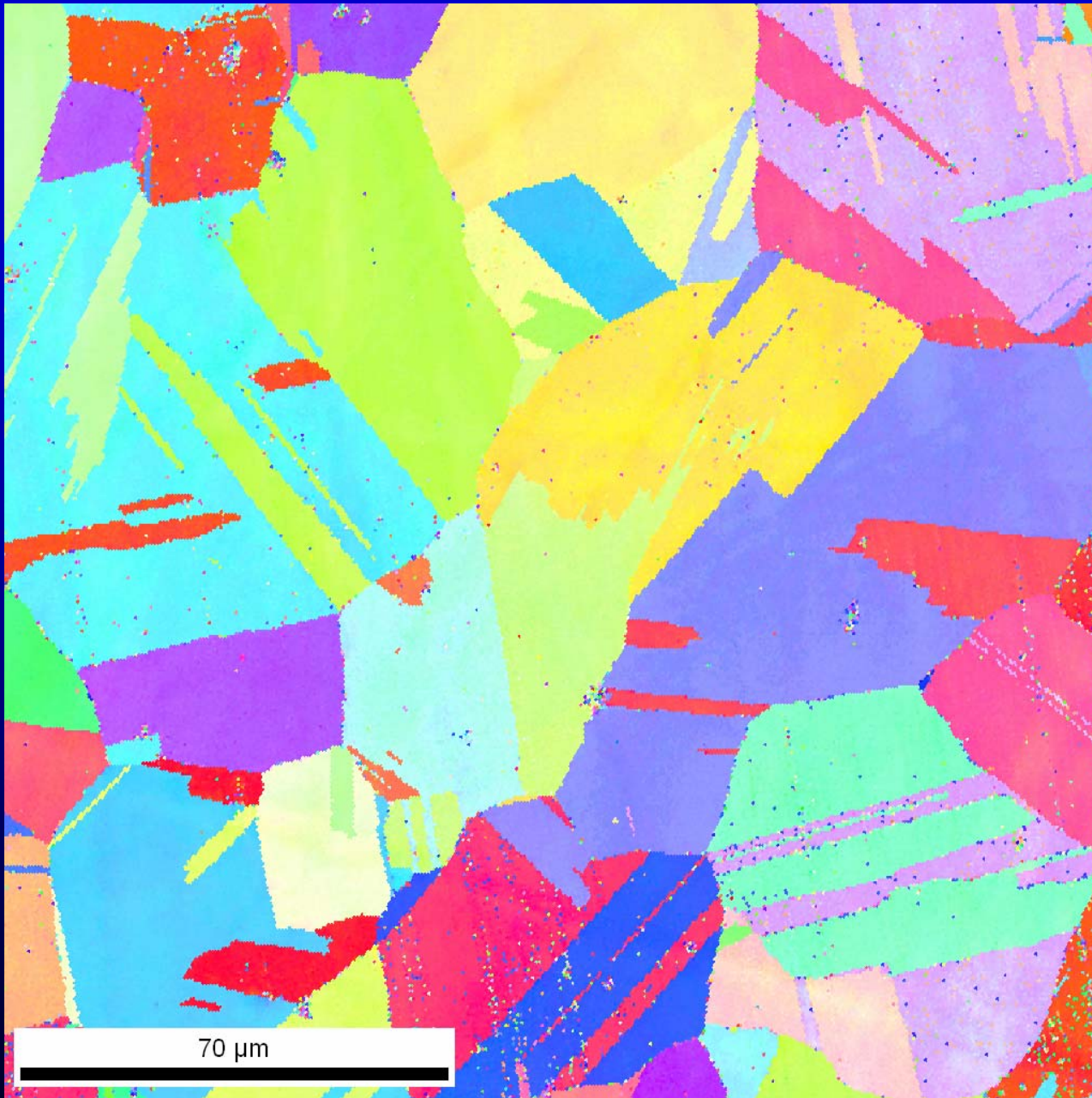




Acc.V 30.0 kV Spot Magn 6.0 2000x Det SE WD 30.1

20 μm

0.5918 mm

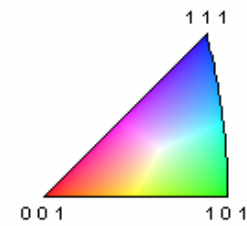


(Highlighted Points)/(Total Number of Points) = 0.000  
(Highlighted Points)/(Number of Good Points) = 0.000  
(Highlighted Points)/(Number of Partition Points) = 0.000

Gray Scale Map Type: <none>

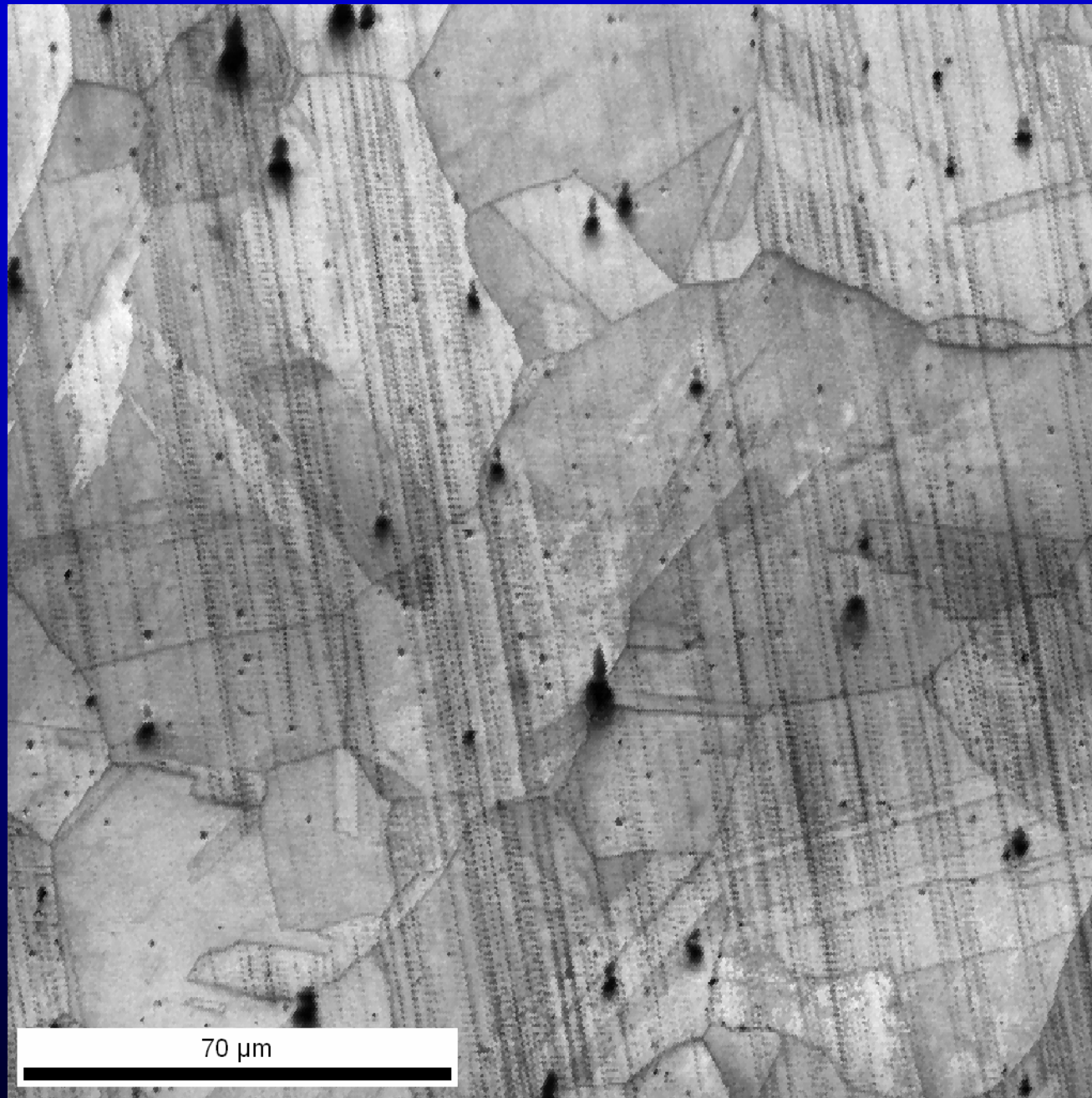
Color Coded Map Type: Inverse Pole Figure [001]

Face Centered Cubic



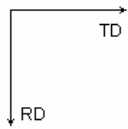
Boundaries: <none>

RT  
1kx 0.5μm step  
size



RT  
1kx 0.5μm step  
size





Gray Scale Map Type: Image Quality  
195.413...6122.73 (195.413...6122.73)

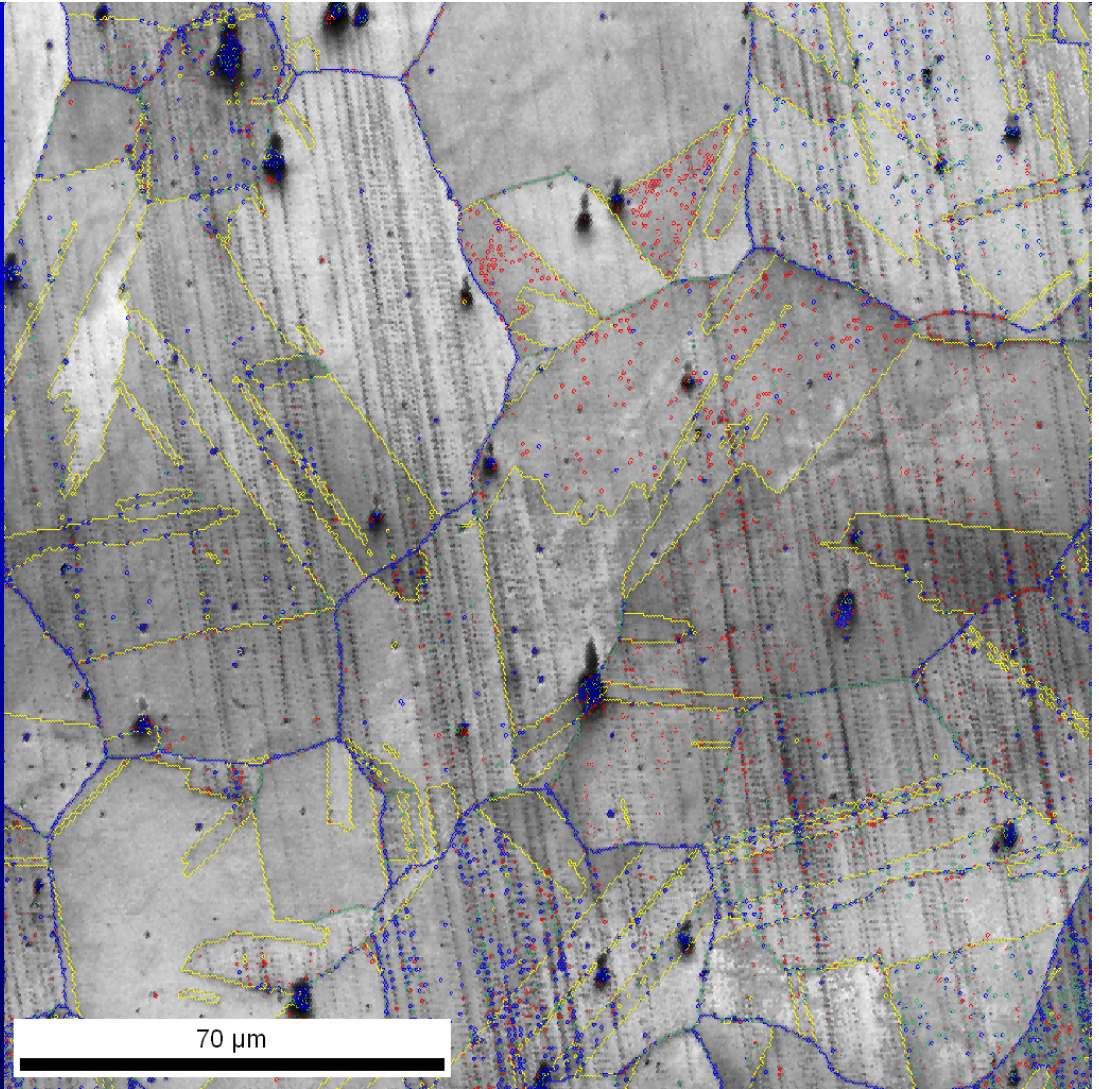
Color Coded Map Type: <none>

Boundaries: Rotation Angle

	Min	Max	Fraction	Number	Length
—	2°	15°	0.163	6840	1.97 mm
—	15°	180°	0.837	35021	1.01 cm

Boundaries: CSL

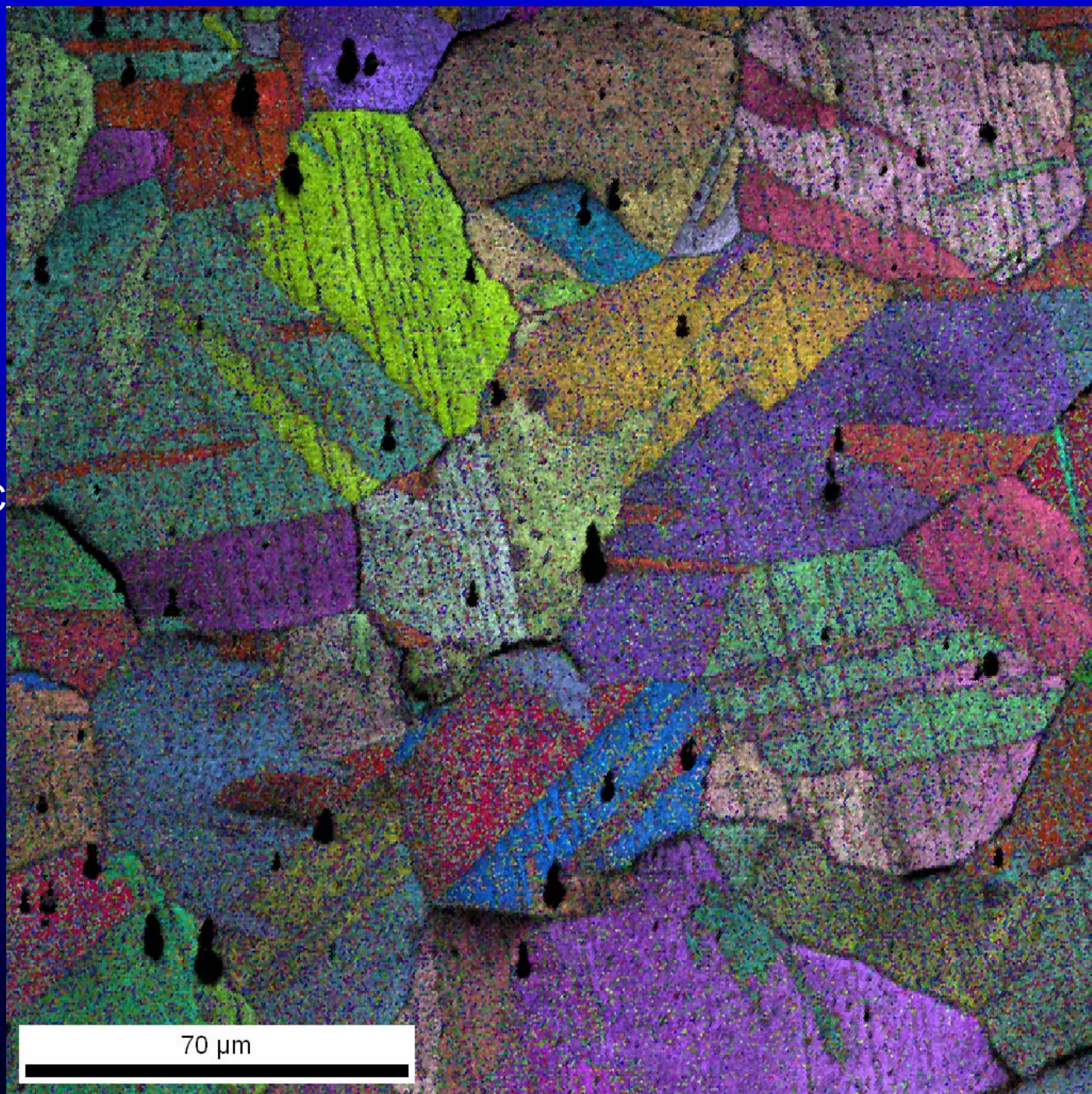
	Sigma	Tolerance	Fraction	Volume	MDF Value	Number	Length
—	3	8.66	0.364	0.0176	20.73	15241	4.3997 mm
—	5	6.71	0.010	0.0123	0.83	425	122.687 microns
—	7	5.67	0.001	0.0099	0.15	62	17.8979 microns
—	9	5.00	0.050	0.0102	4.92	2090	603.331 microns
—	11	4.52	0.014	0.0075	1.87	588	169.741 microns
—	13a	4.16	0.001	0.0029	0.29	35	10.1036 microns
—	13b	4.16	0.024	0.0039	6.24	1019	294.16 microns
—	15	3.87	0.002	0.0094	0.18	70	20.2073 microns
—	17a	3.64	0.001	0.0020	0.45	37	10.681 microns
—	17b	3.64	0.002	0.0039	0.56	92	26.5581 microns
—	19a	3.44	0.008	0.0033	2.42	335	96.7061 microns
—	19b	3.44	0.000	0.0022	0.11	10	2.88675 microns
—	21a	3.27	0.000	0.0019	0.05	4	1.1547 microns
—	21b	3.27	0.002	0.0057	0.29	68	19.6299 microns
—	23	3.13	0.001	0.0050	0.14	29	8.37158 microns
—	25a	3.00	0.001	0.0011	0.50	23	6.63953 microns
—	25b	3.00	0.001	0.0044	0.19	35	10.1036 microns
—	27a	2.89	0.007	0.0020	3.45	282	81.4064 microns
—	27b	2.89	0.007	0.0039	1.78	291	84.0044 microns
—	29a	2.79	0.011	0.0009	12.85	472	136.255 microns
—	29b	2.79	0.002	0.0035	0.58	85	24.5374 microns
summary	-	-	0.508	0.1133	4.49	-	-



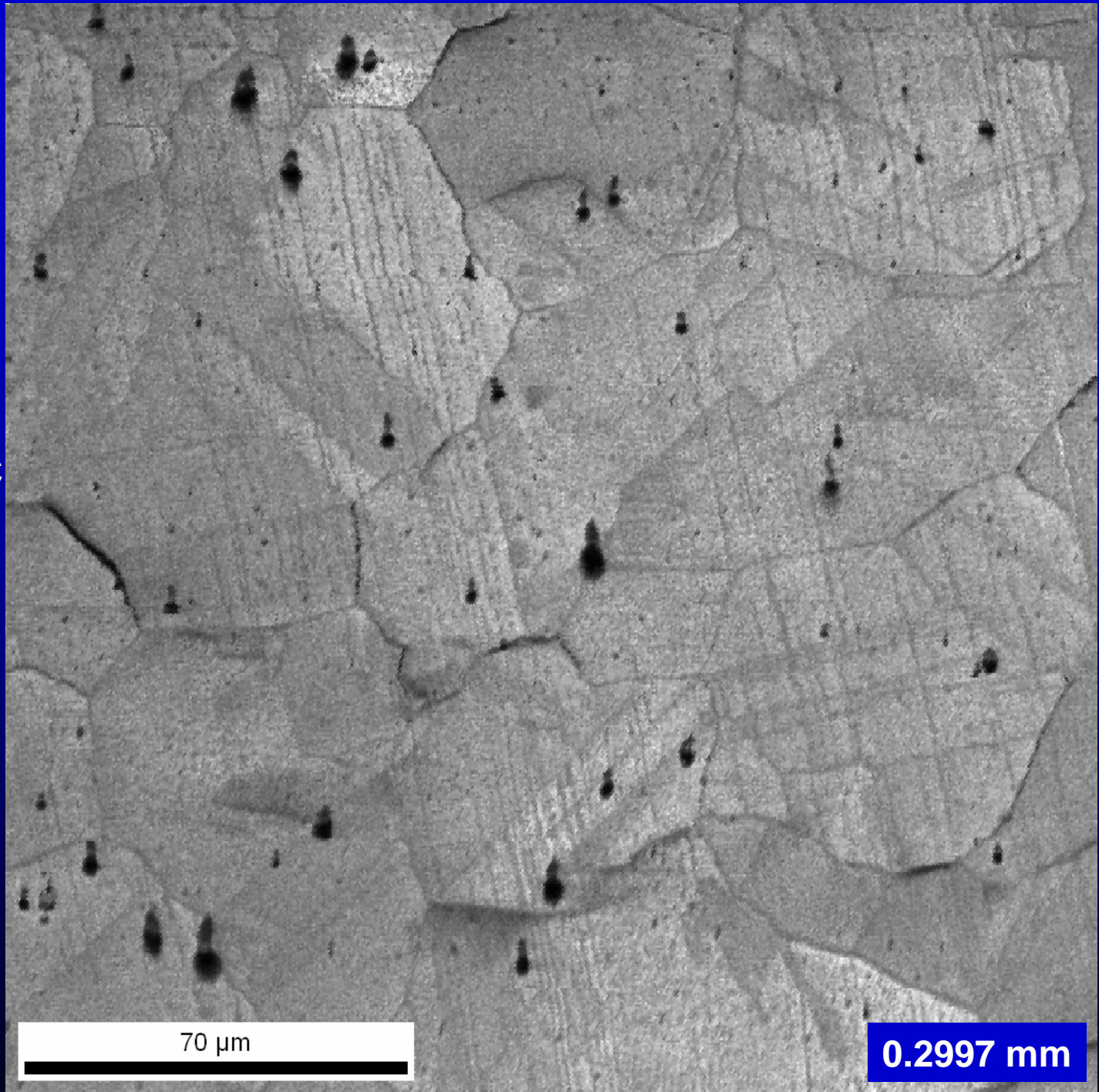
\*For statistics - any point pair with misorientation exceeding 2° is considered a boundary  
total number = 41861, total length = 1.21 cm)

RT  
1kx 0.5µm step size

0.0118in – 752°C



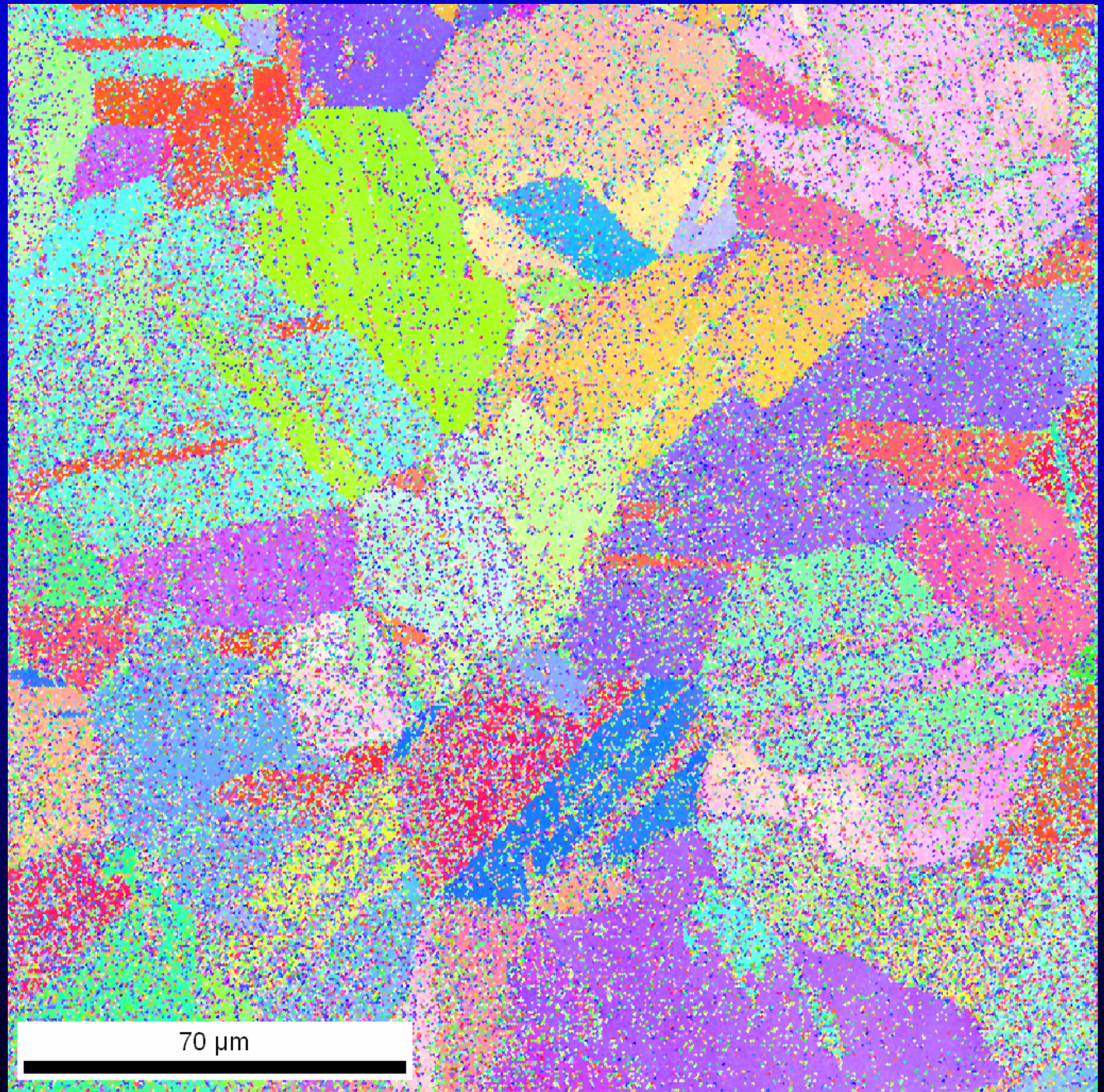
0.0118in – 752°C



70  $\mu\text{m}$

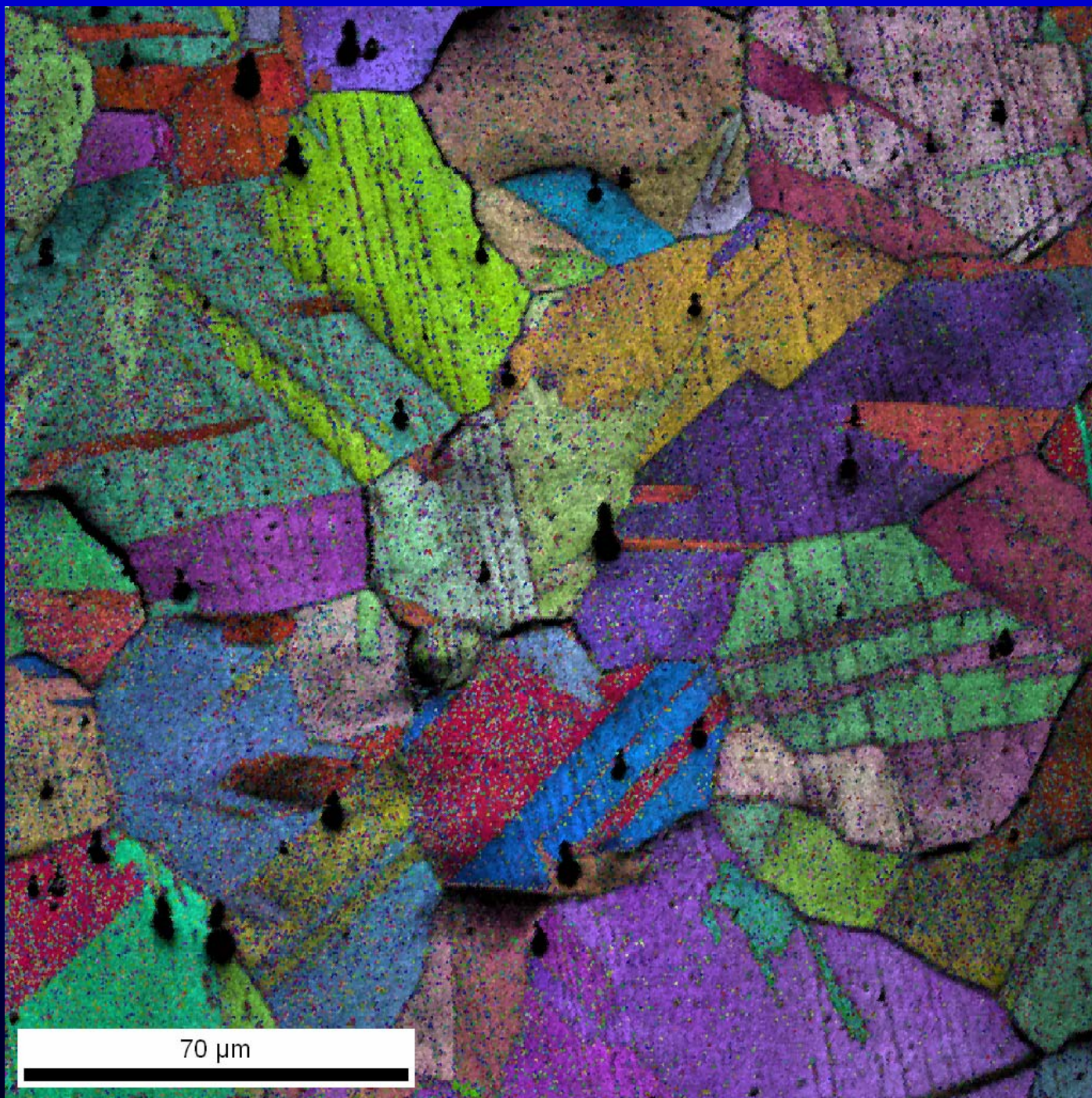
0.2997 mm

0.0118in – 752°C

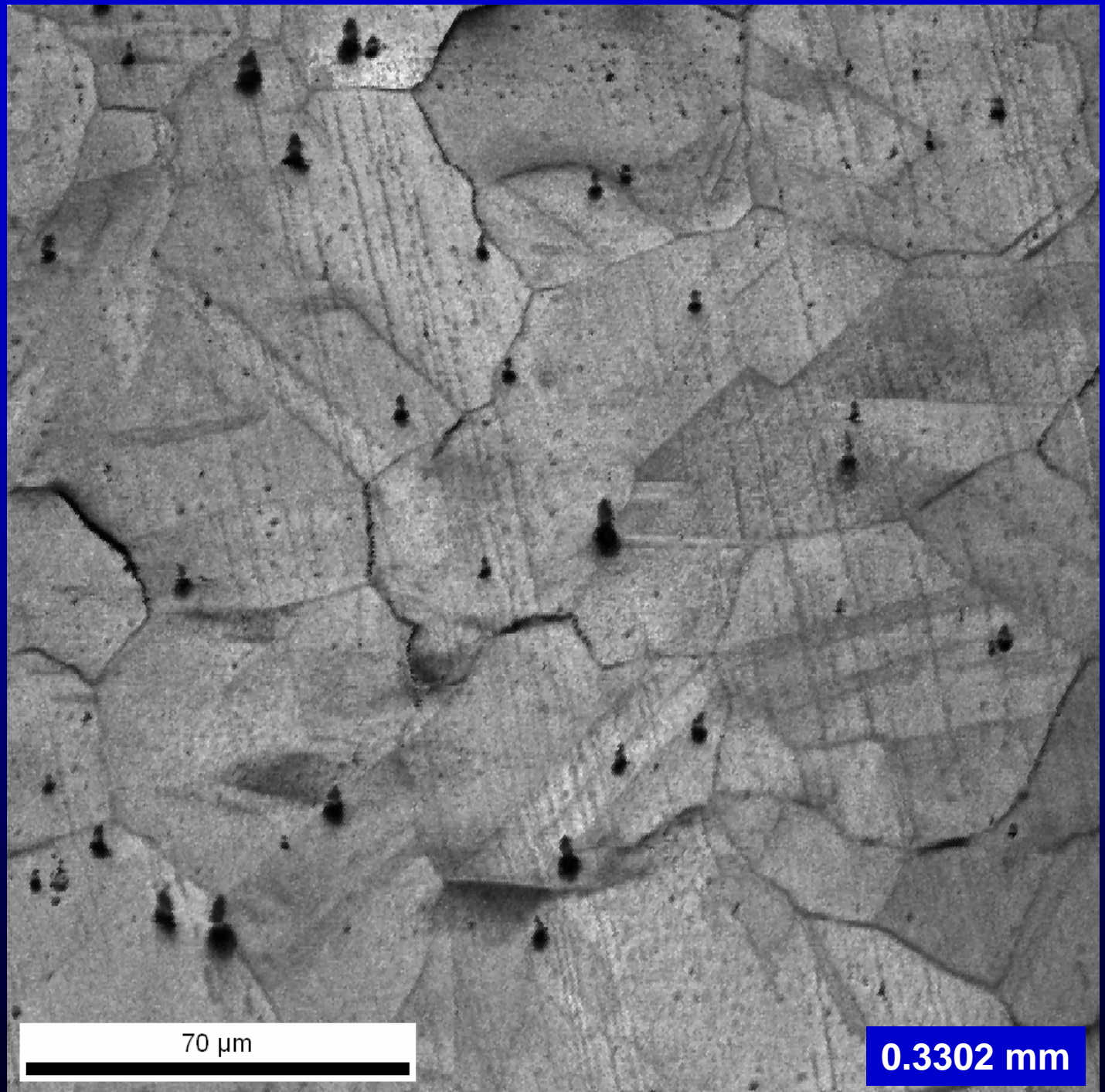


70 μm

0.0130in – 753°C



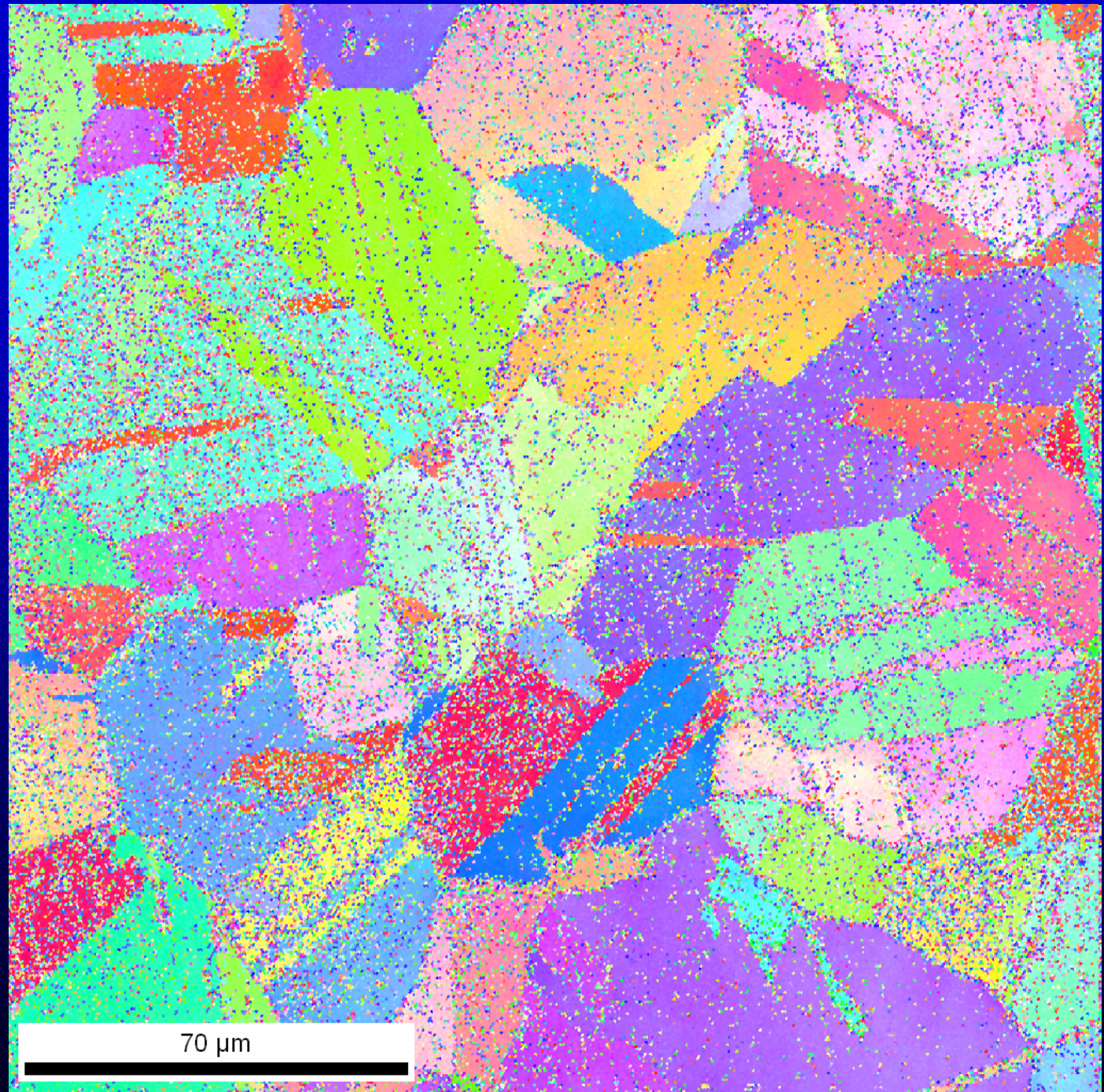
0.0130in – 753°C



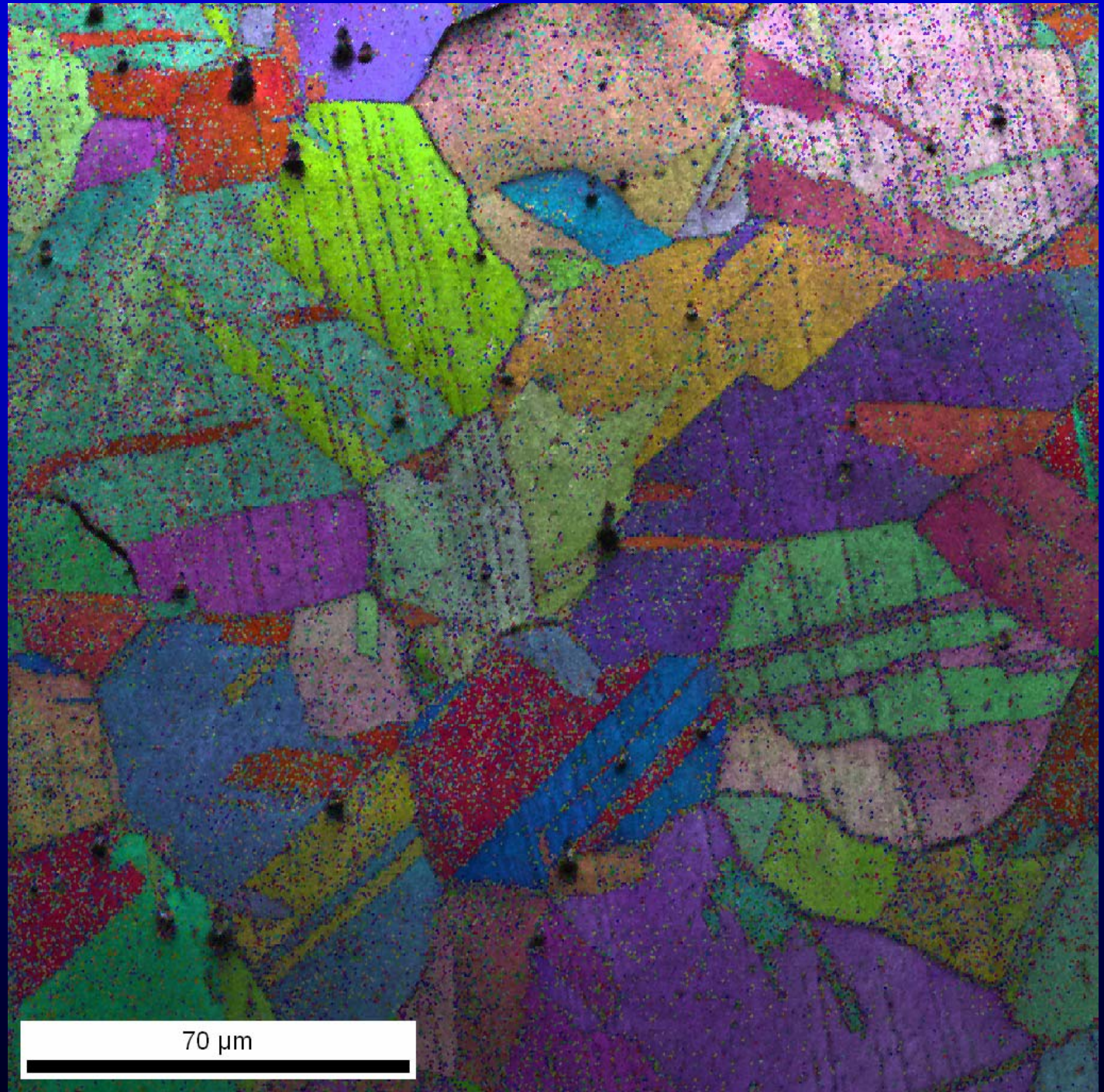
70  $\mu\text{m}$

0.3302 mm

0.0130in – 753°C

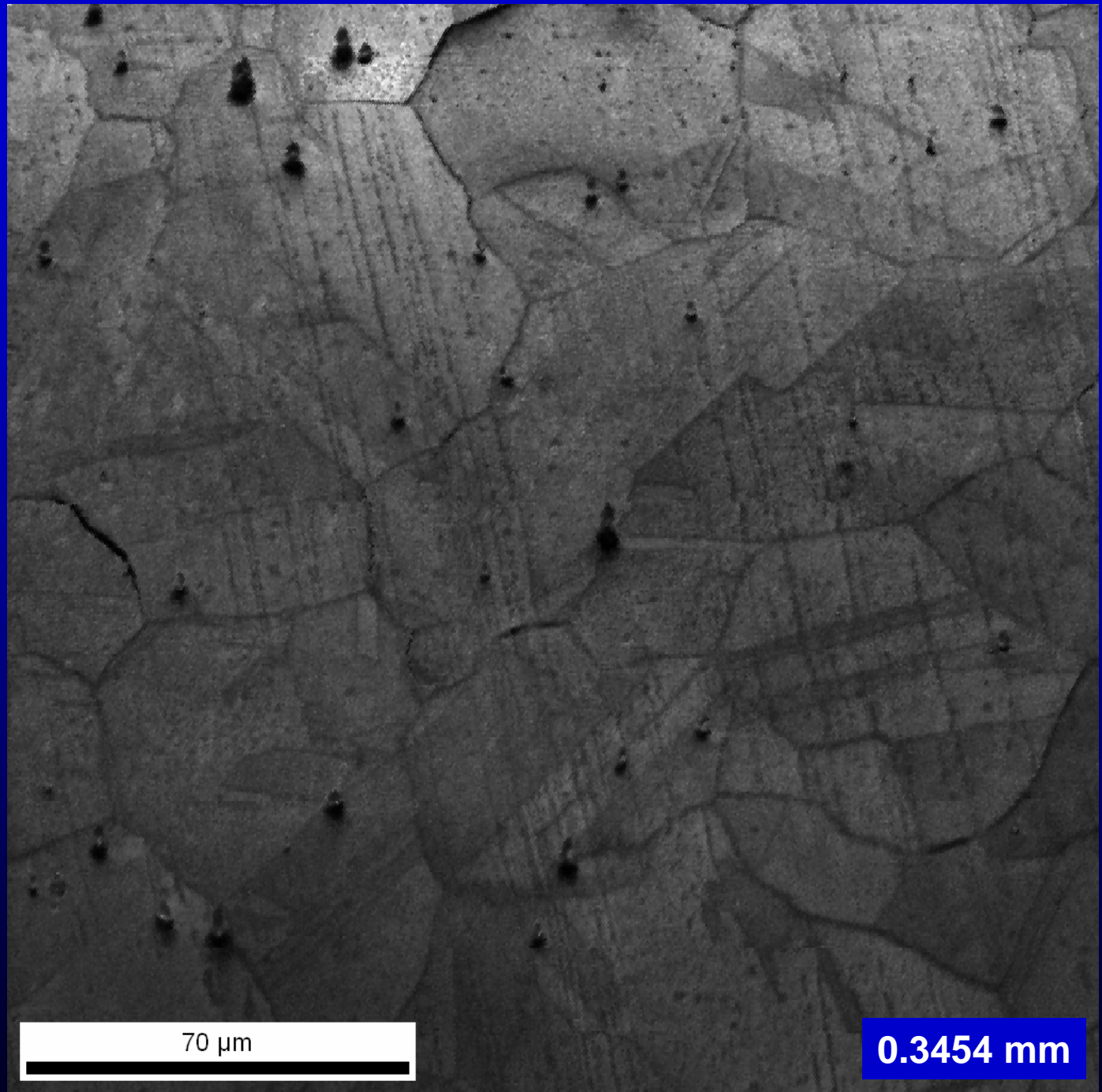


0.0136in – 754°C





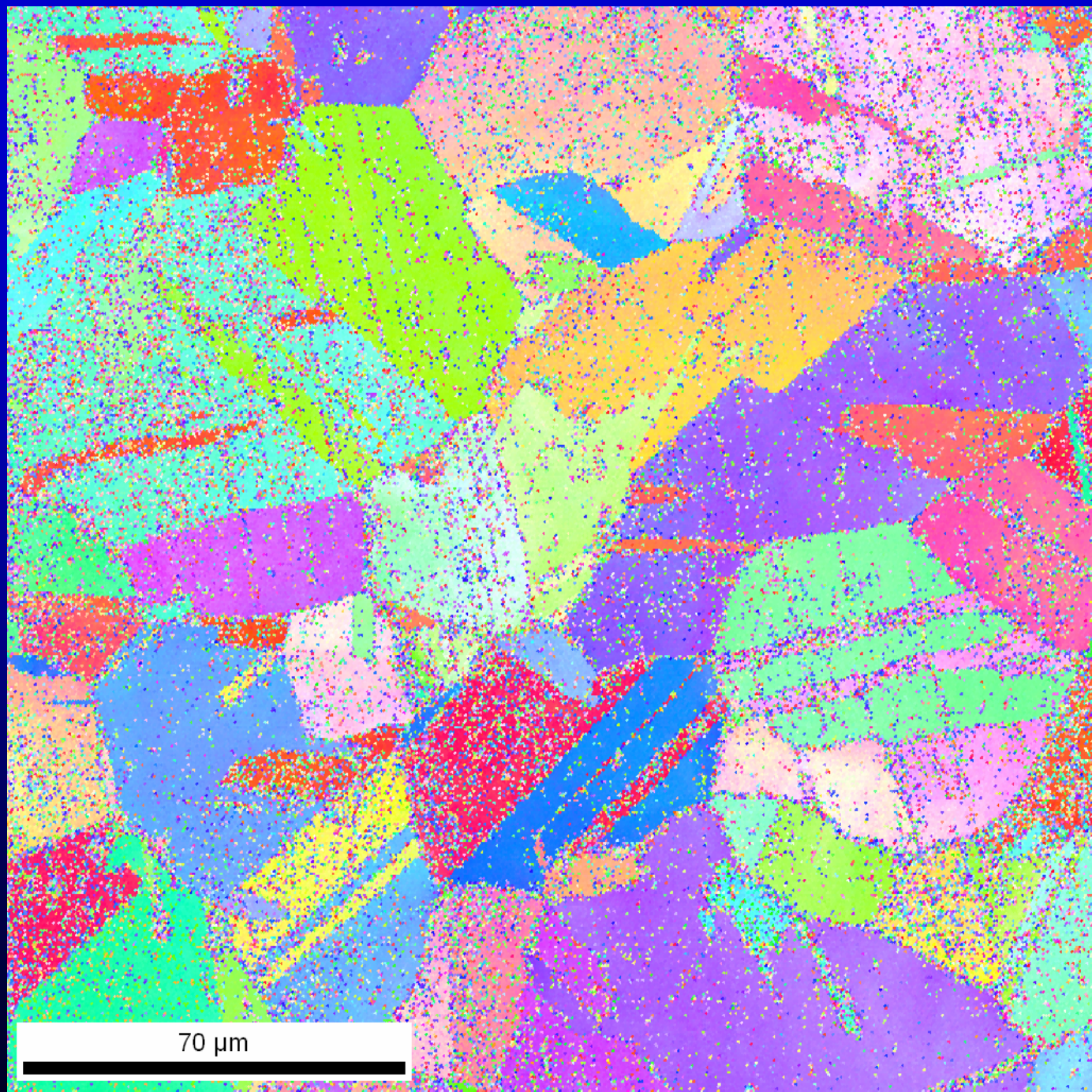
0.0136in – 754°C



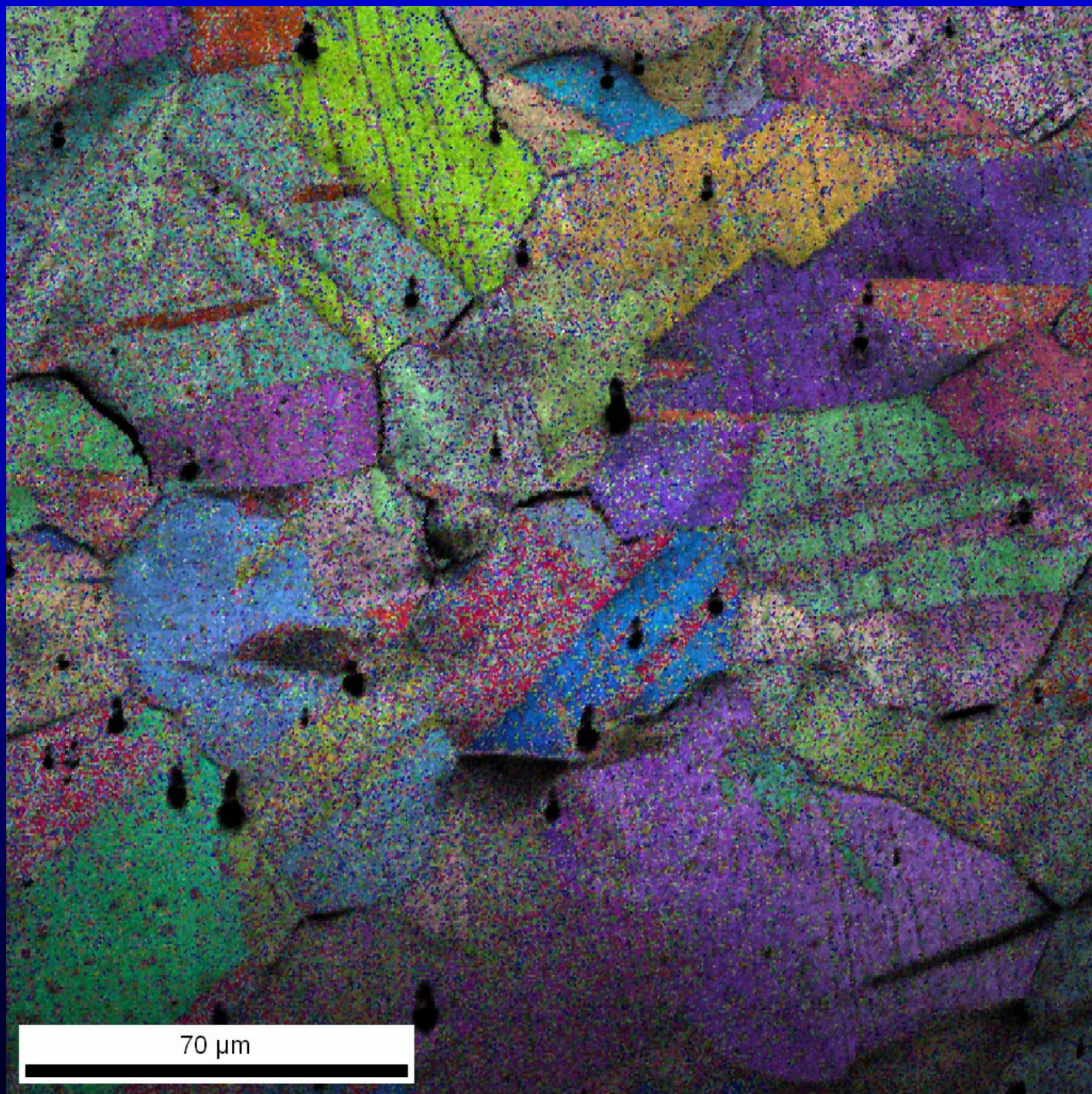
70 μm

0.3454 mm

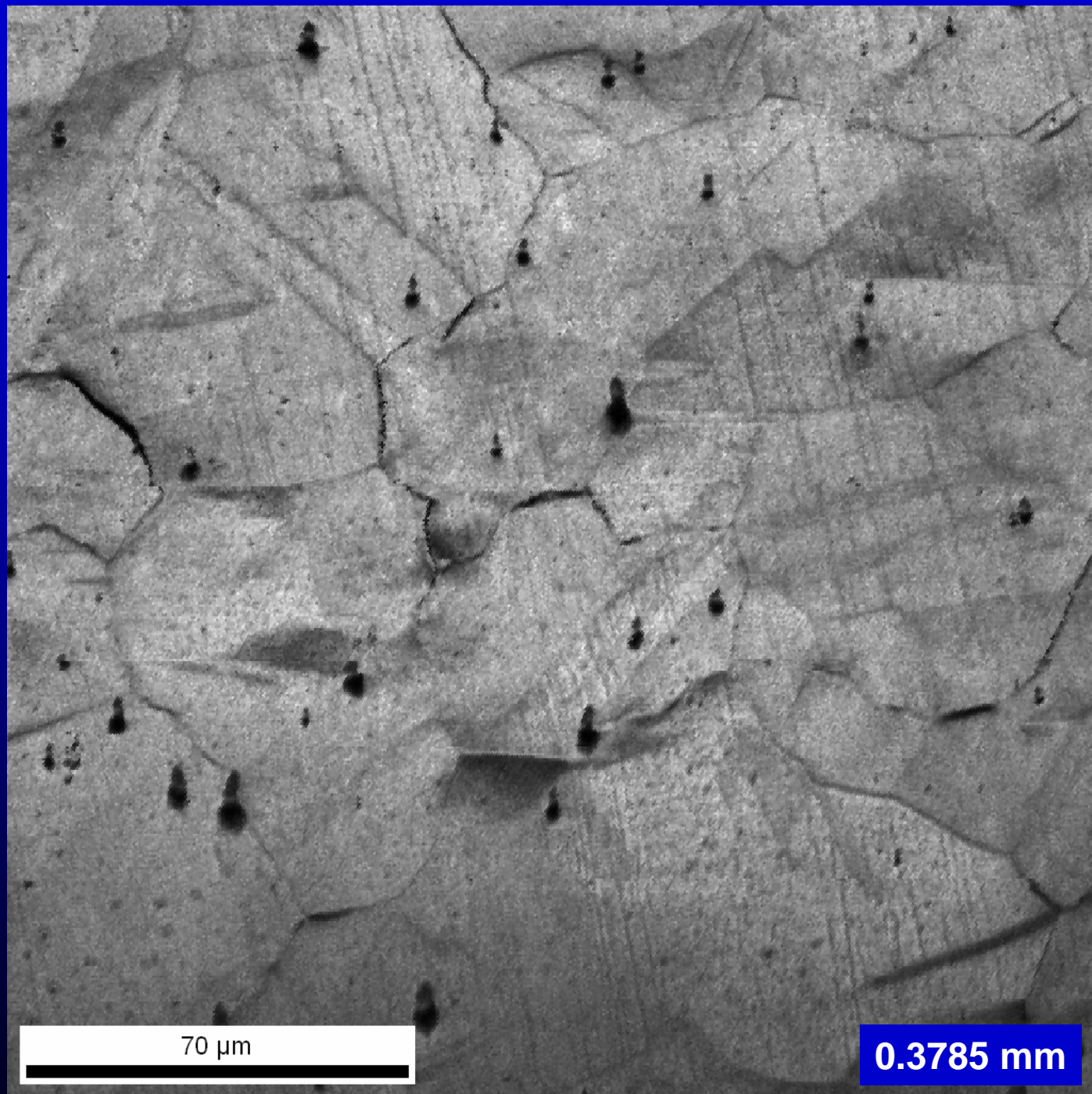
0.0136in – 754°C



0.0149in – 757°C



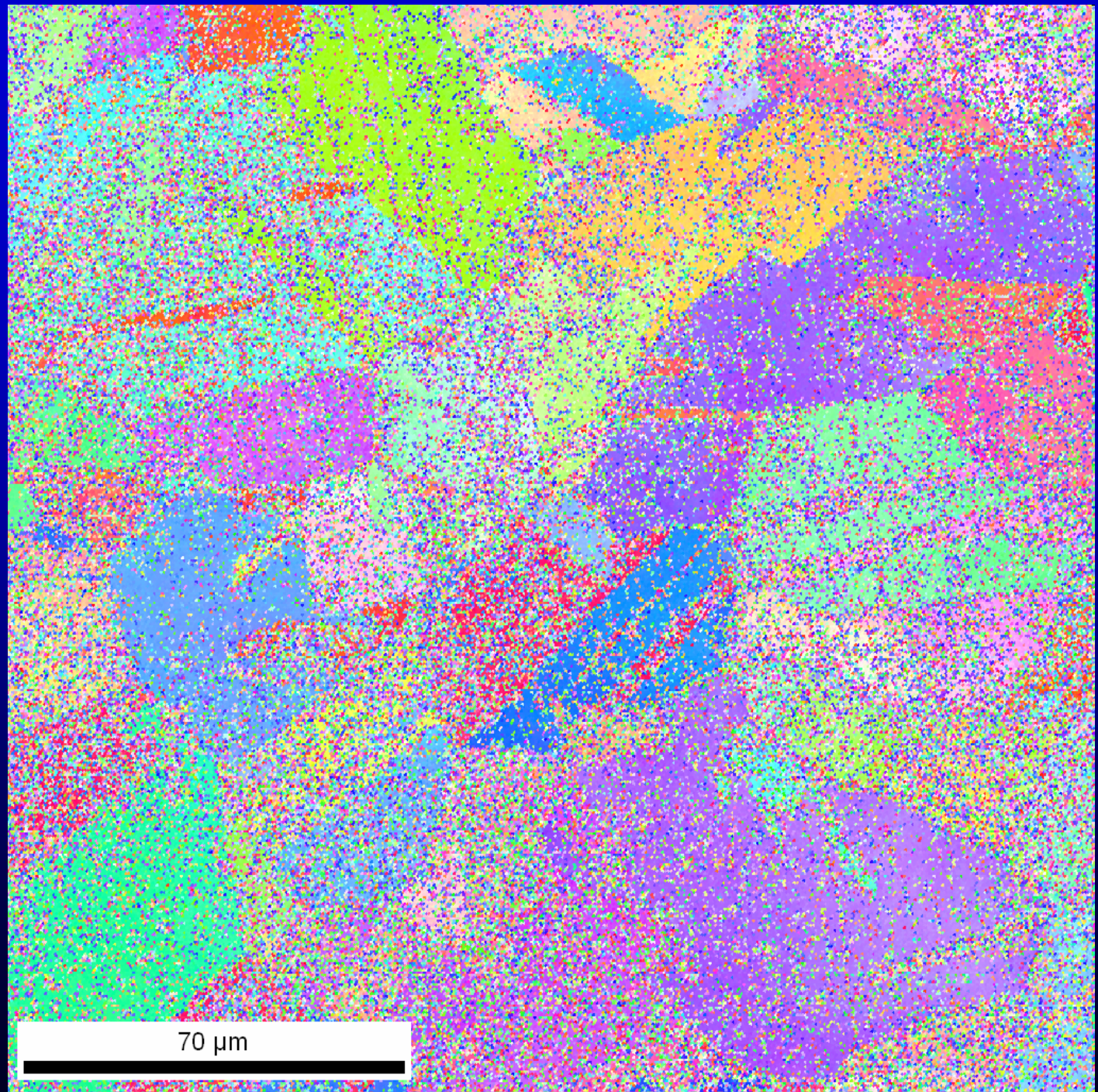
0.0149in – 757°C



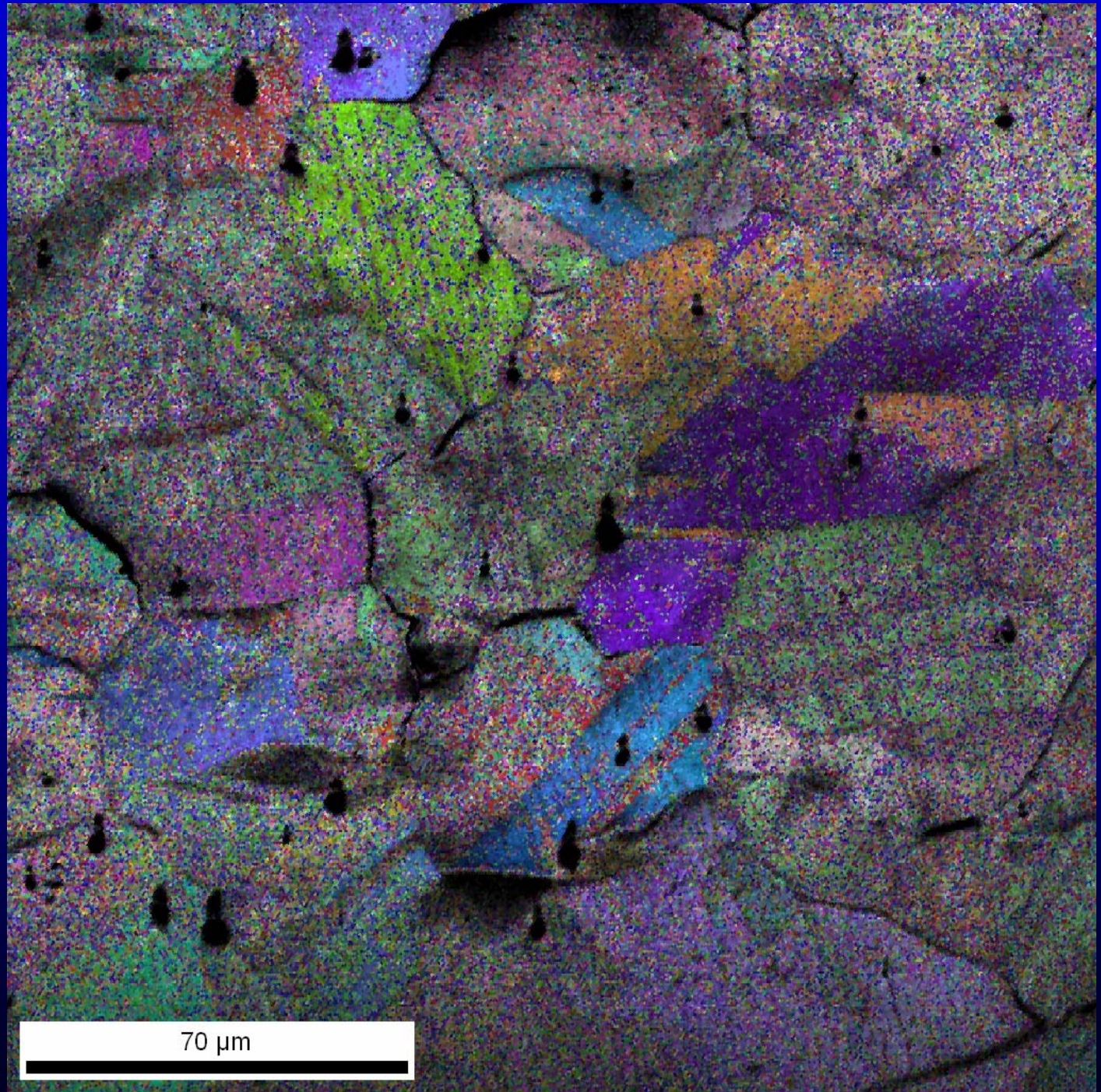
70  $\mu\text{m}$

0.3785 mm

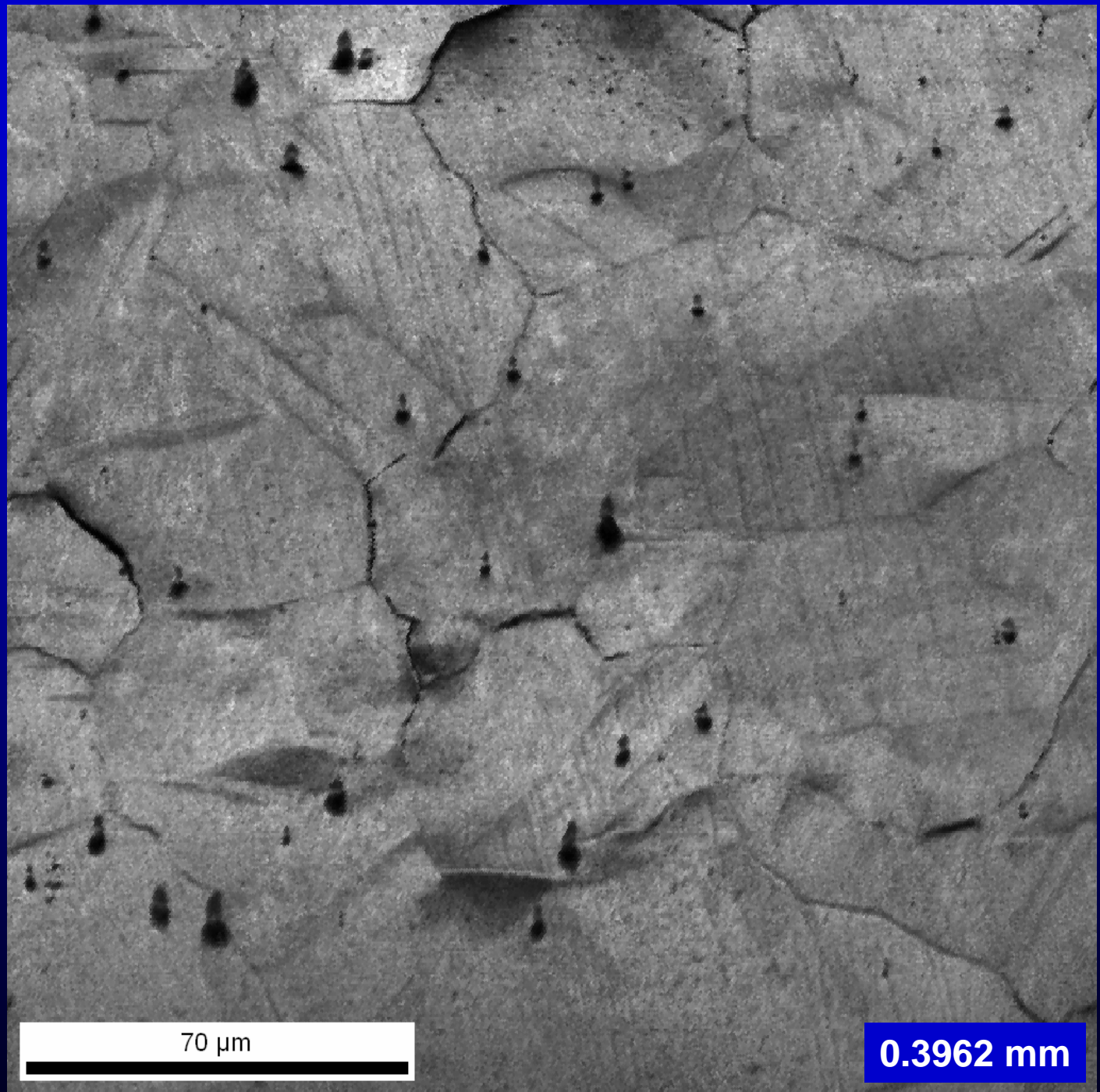
0.0149in – 757°C



0.0156in – 758°C



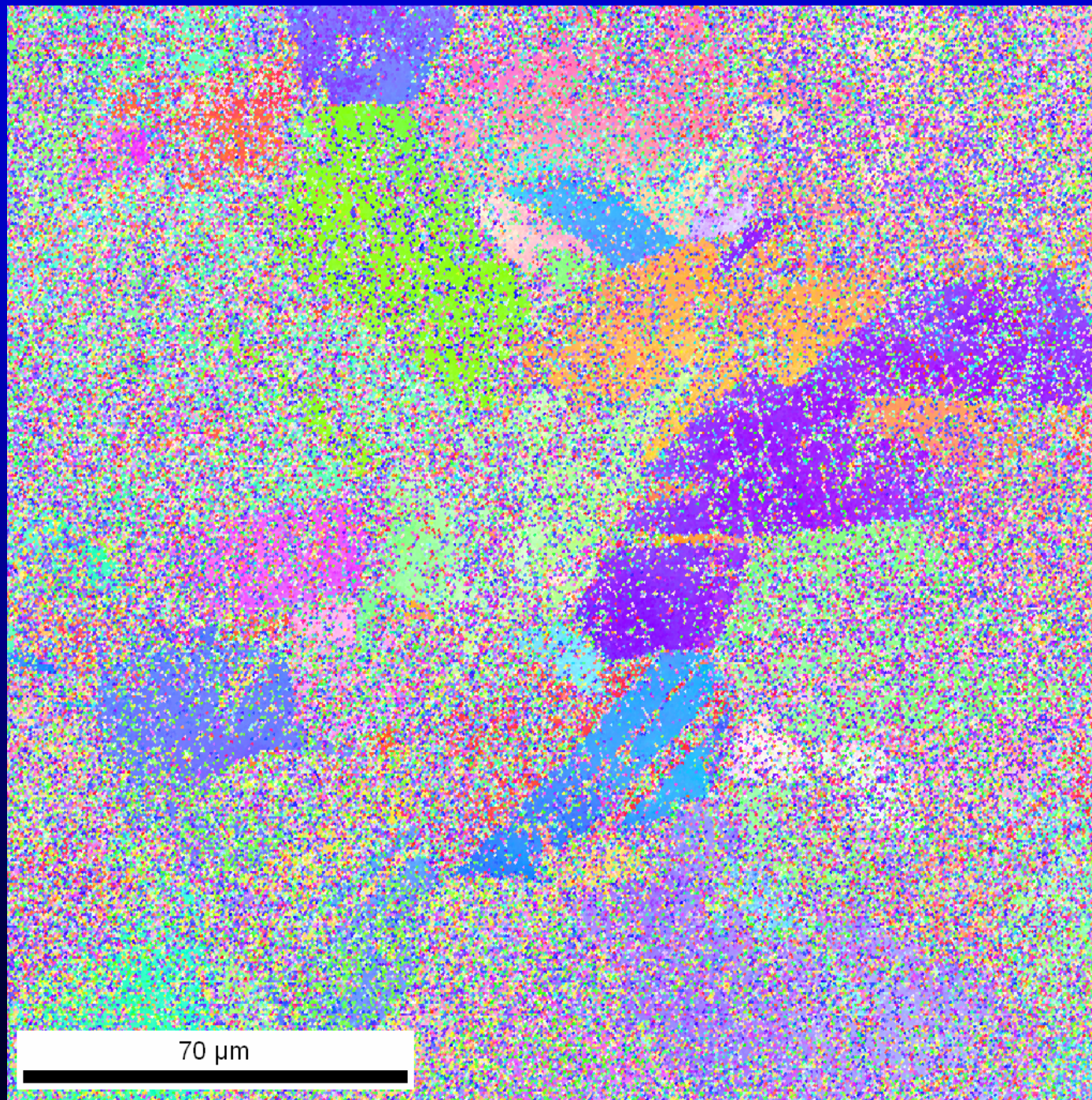
0.0156in – 758°C



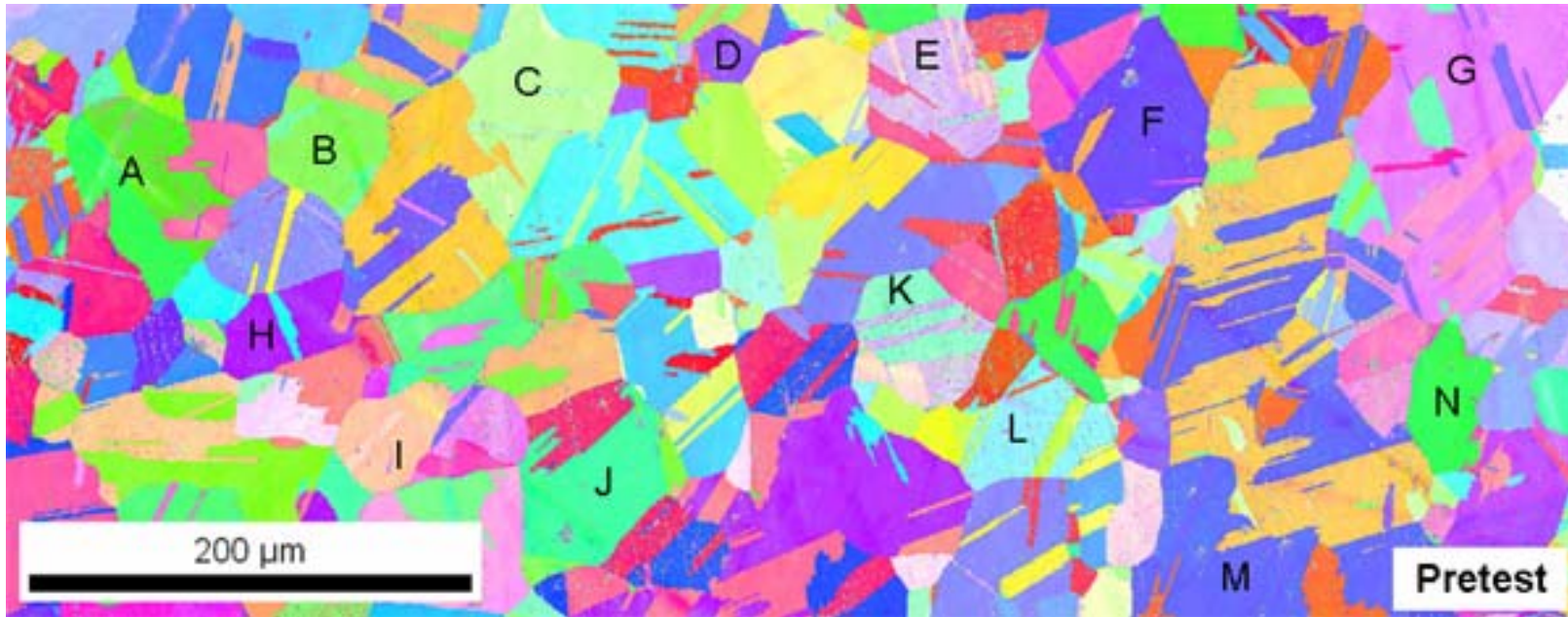
70  $\mu\text{m}$

0.3962 mm

0.0156in – 758°C



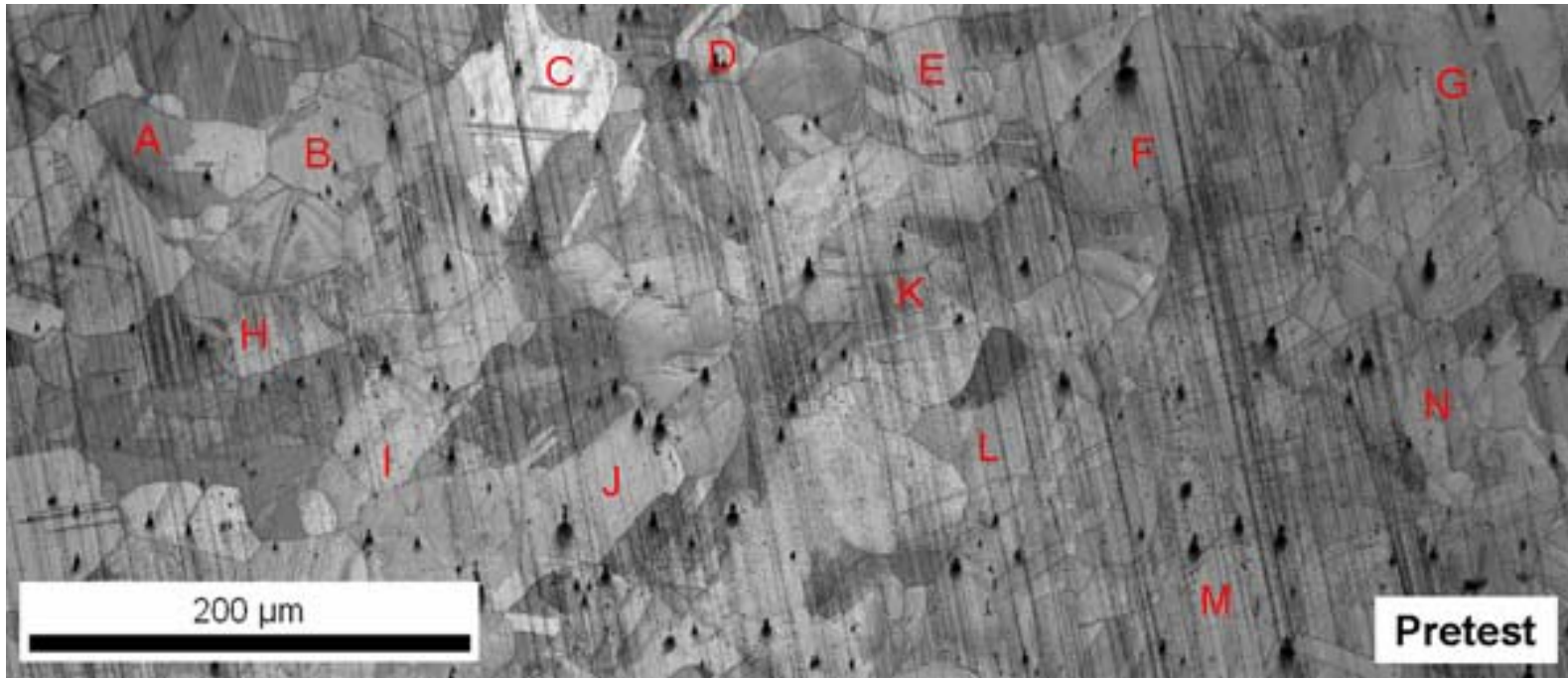




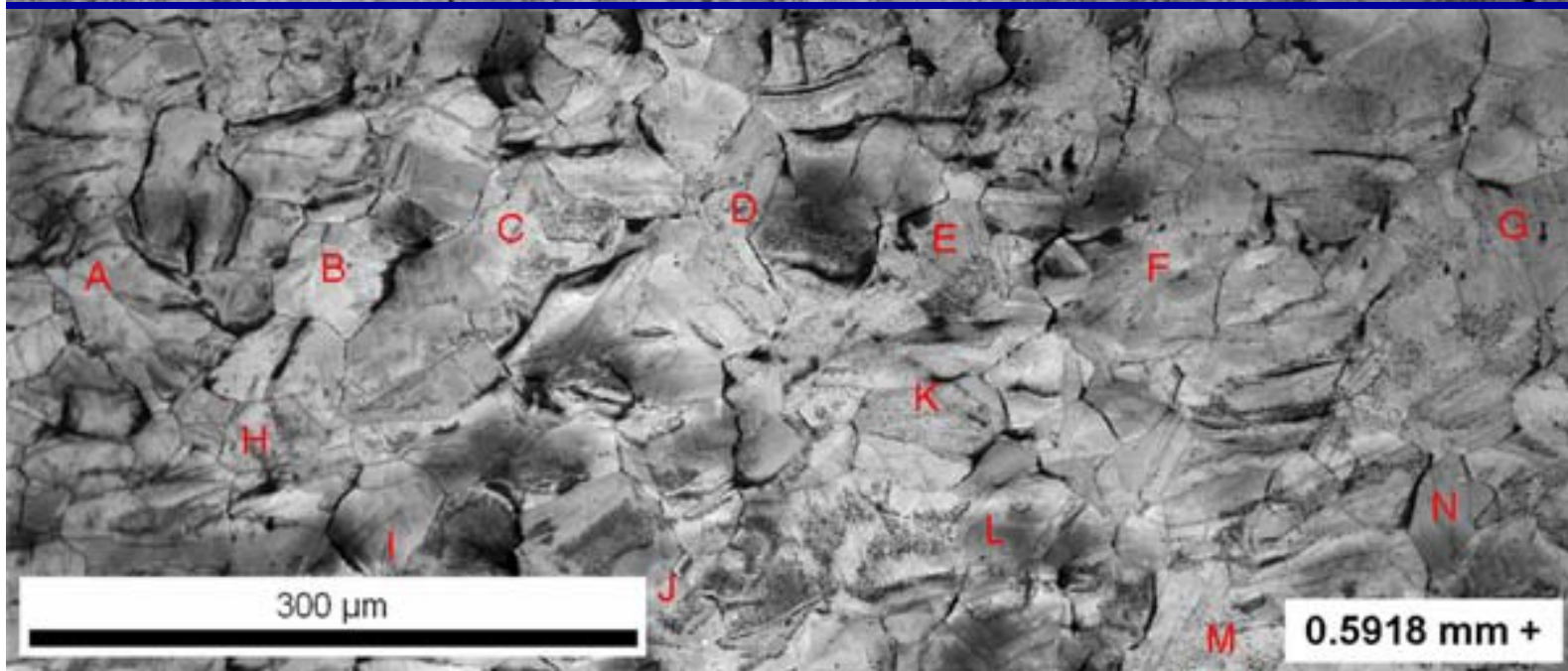
pretest



posttest



pretest



posttest

# Acknowledgments

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