



Recrystallization kinetics of Fe-30Ni alloy with 0.008-0.083% Nb

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Why recrystallization kinetics?

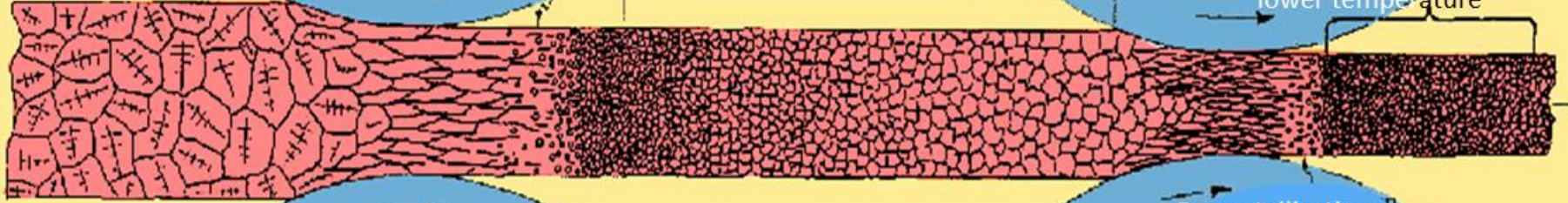
Coarse
grain
structure

Recrystallization
starts

Rapid grain growth
due to high
temperature

Slower grain
growth due to
lower temperature

Recrystallization





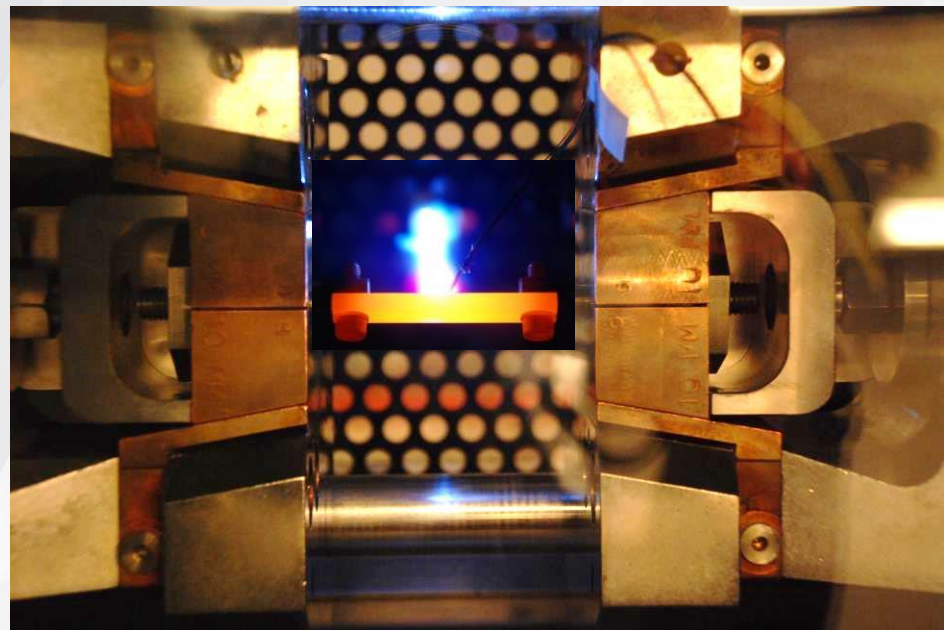
Gleeble



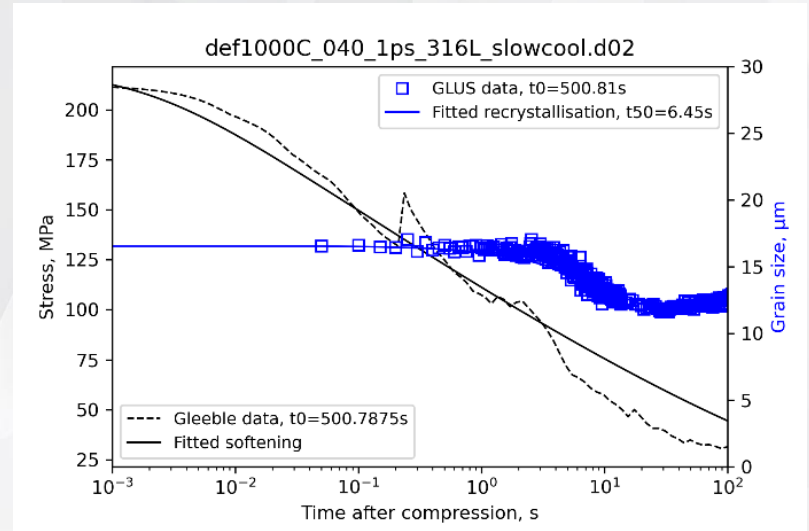
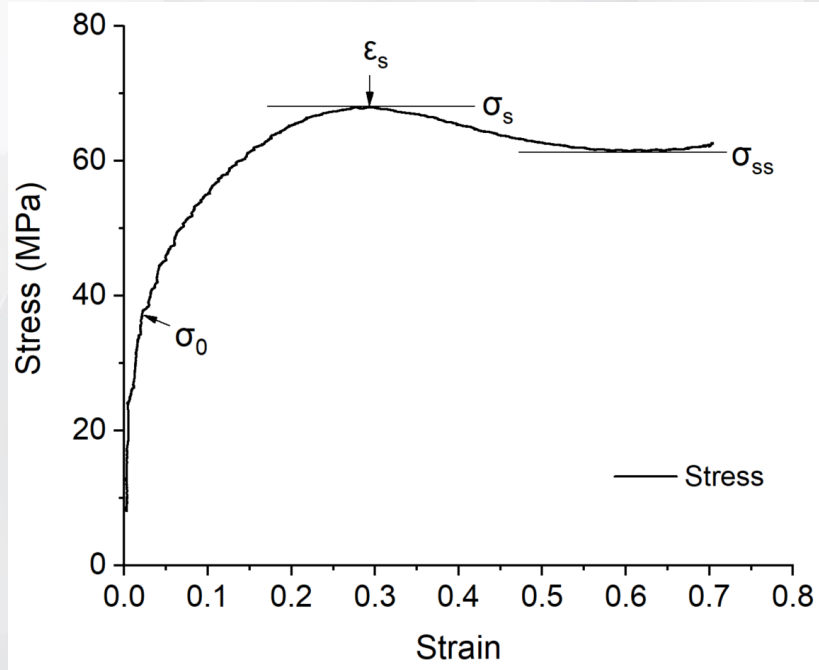
LUS



GLUS[®] at Swerim Kista

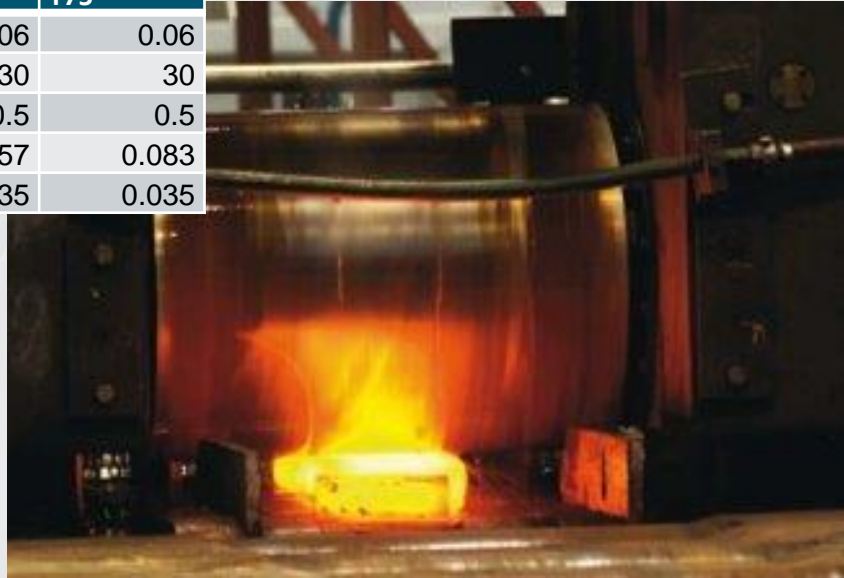


GLUS data



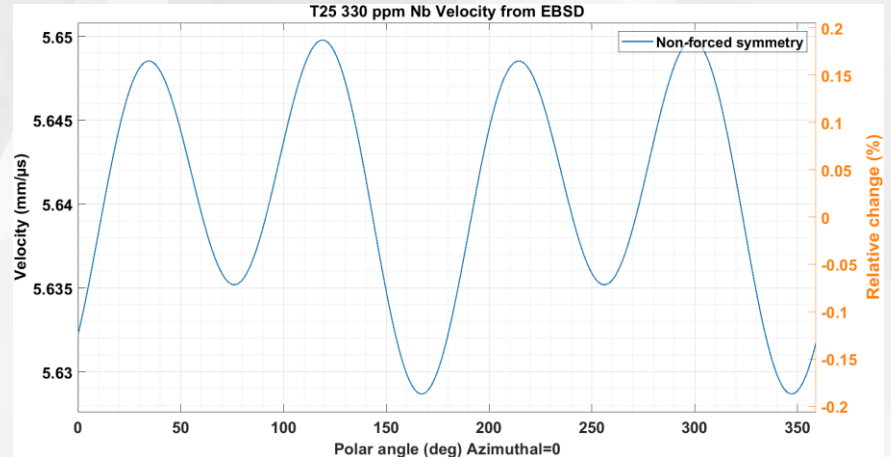
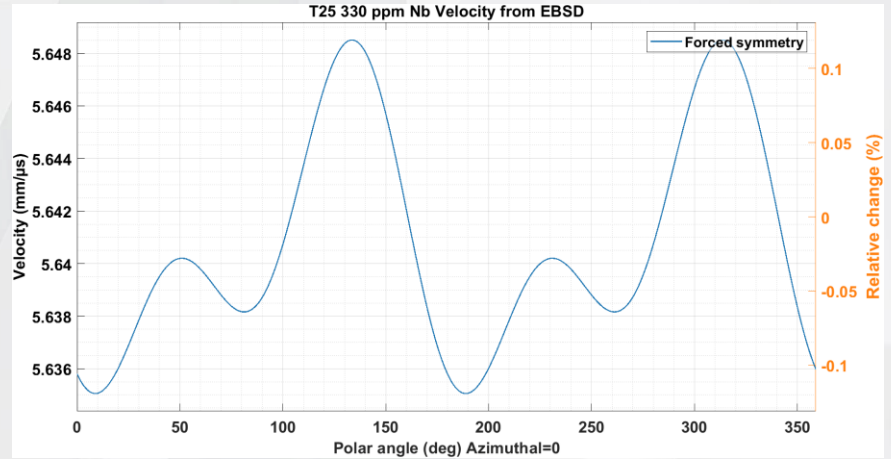
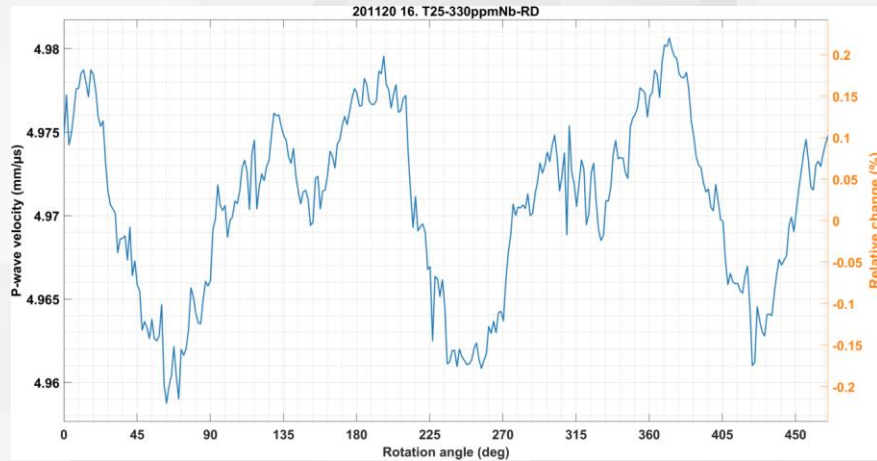
Sample preparation

Element	Reference	T25	T50	T75
C	0.06	0.06	0.06	0.06
Ni	30	30	30	30
Mn	0.5	0.5	0.5	0.5
Nb	0.008	0.033	0.057	0.083
Al	0.035	0.035	0.035	0.035



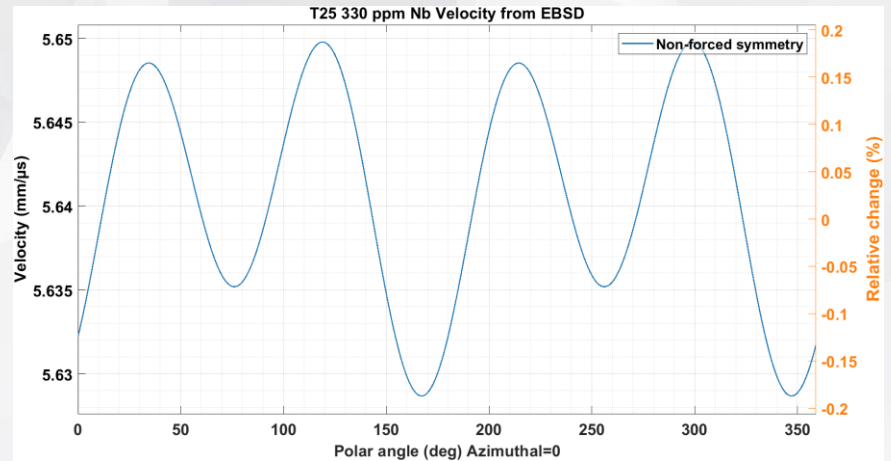
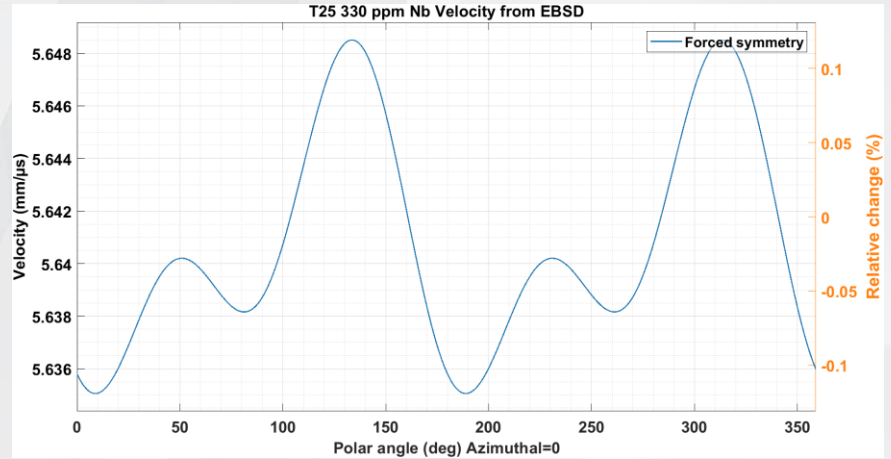
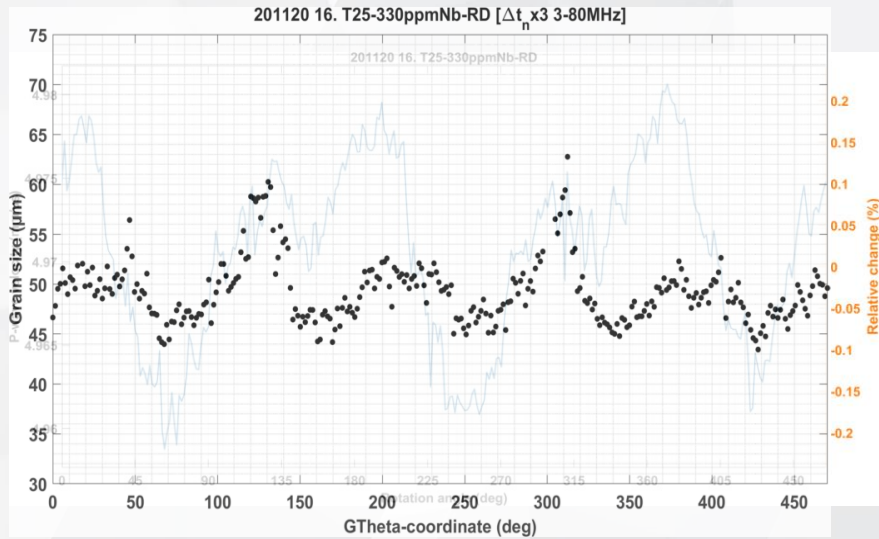
Rotational measurements for material texture

TD-ND



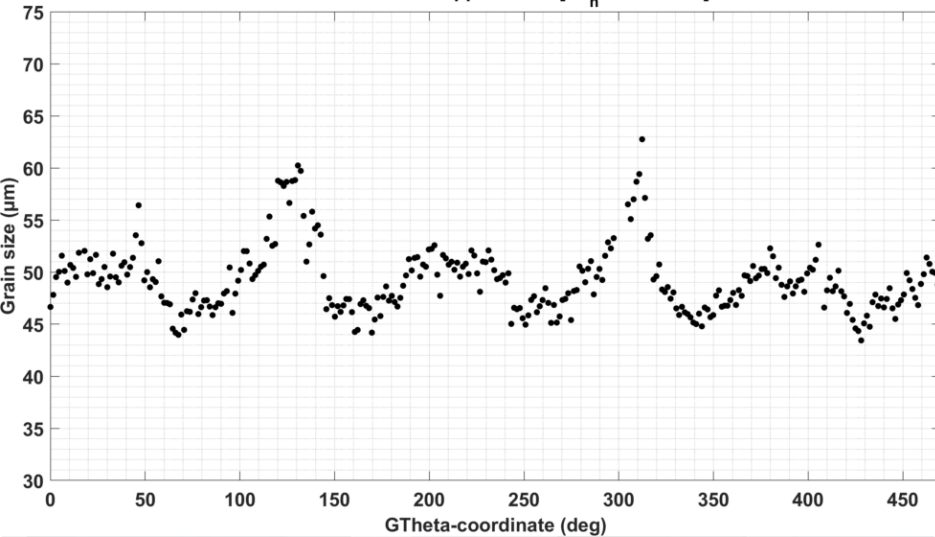
Rotational measurements for material texture

TD-ND

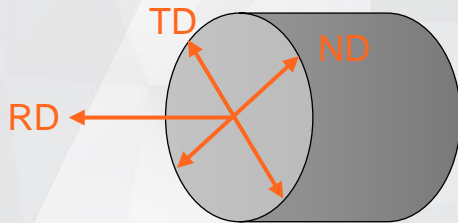
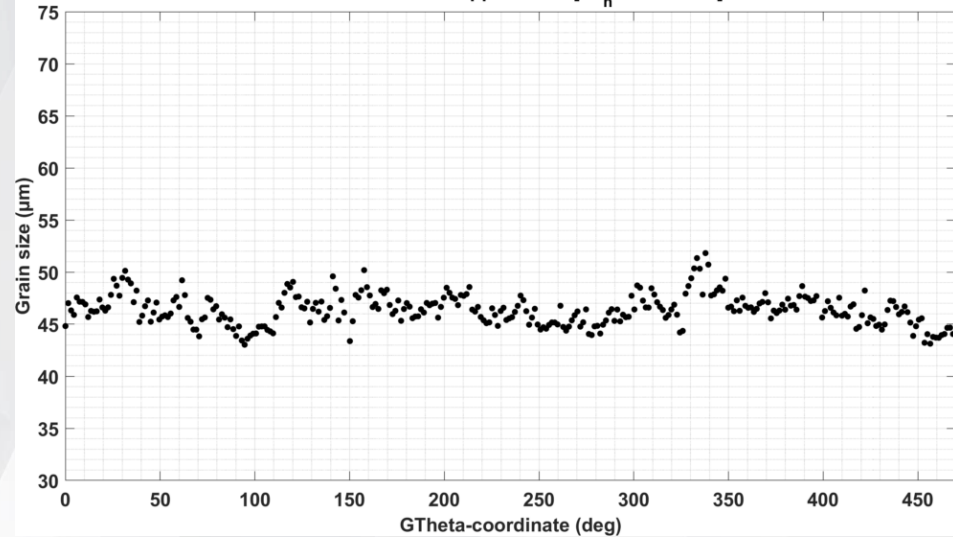


Texture TD-ND and RD-ND

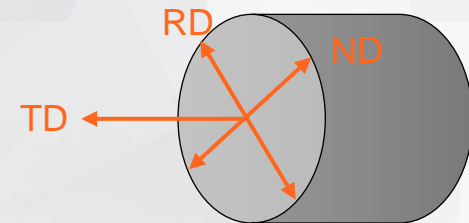
201120 16. T25-330ppmNb-RD [$\Delta t_n \times 3$ 3-80MHz]



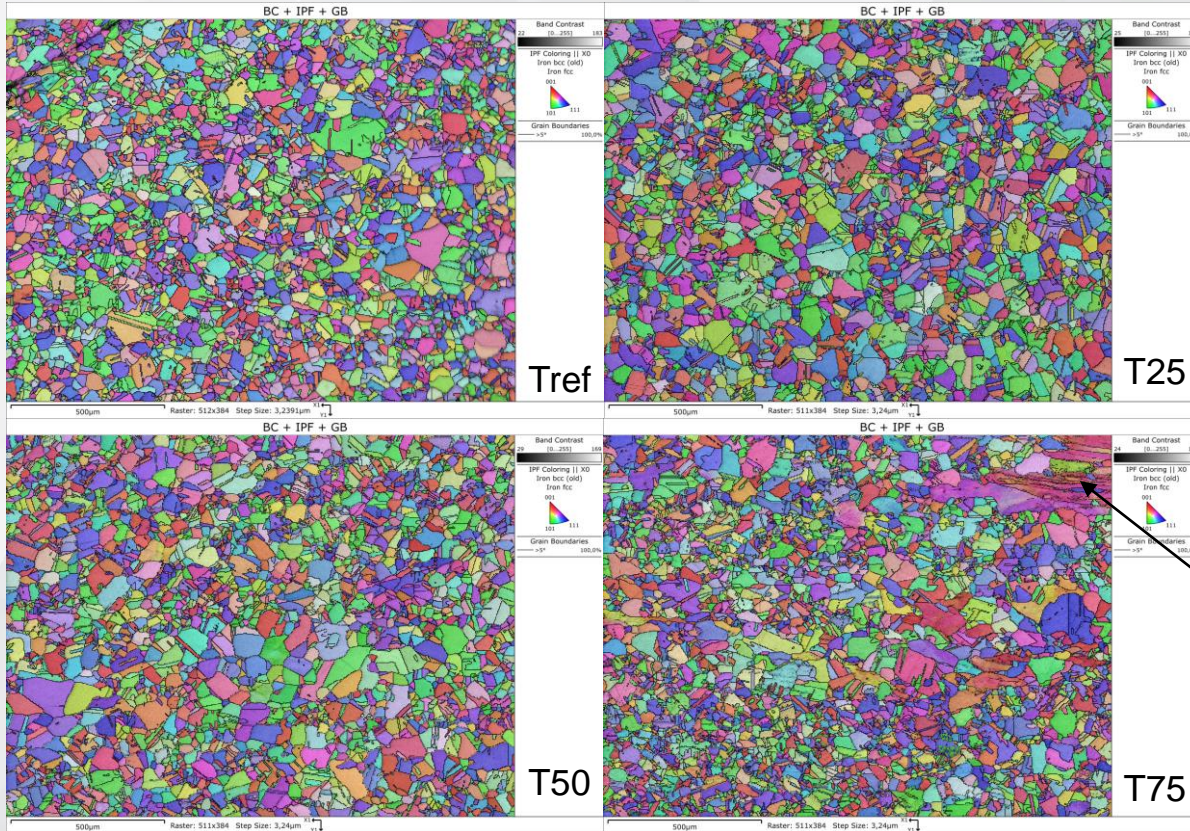
201120 20. T25-330ppmNb-TD [$\Delta t_n \times 3$ 3-80MHz]



Rotation

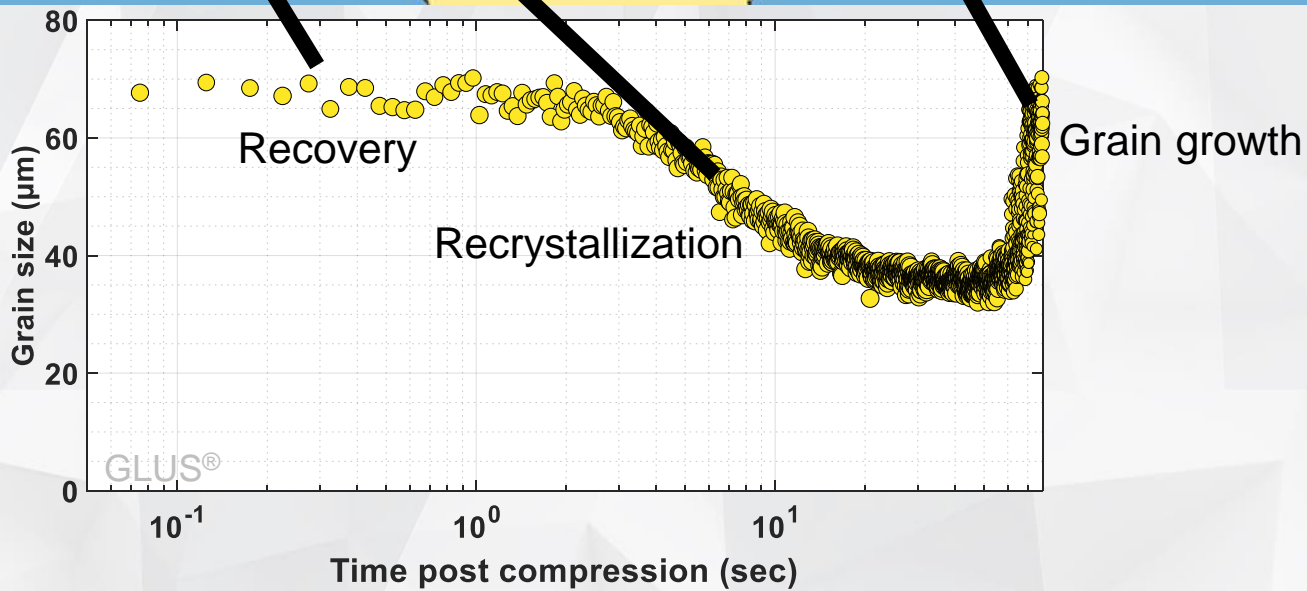
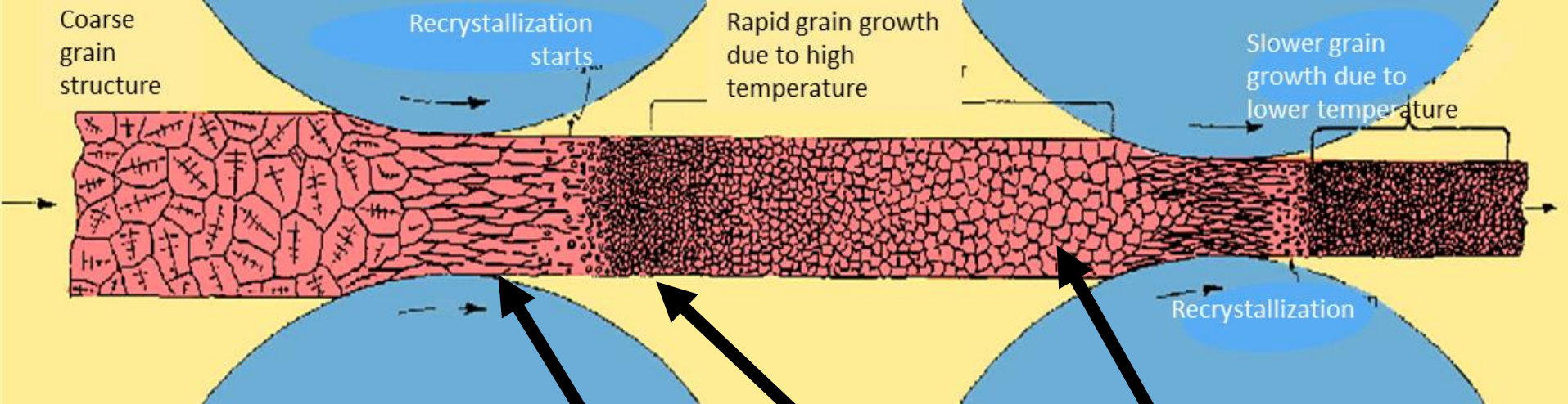


EBSD - After hot rolling

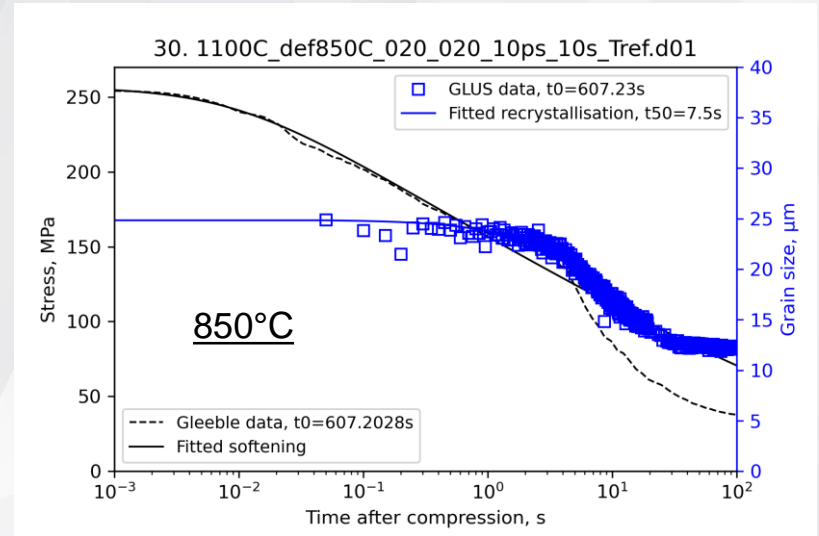
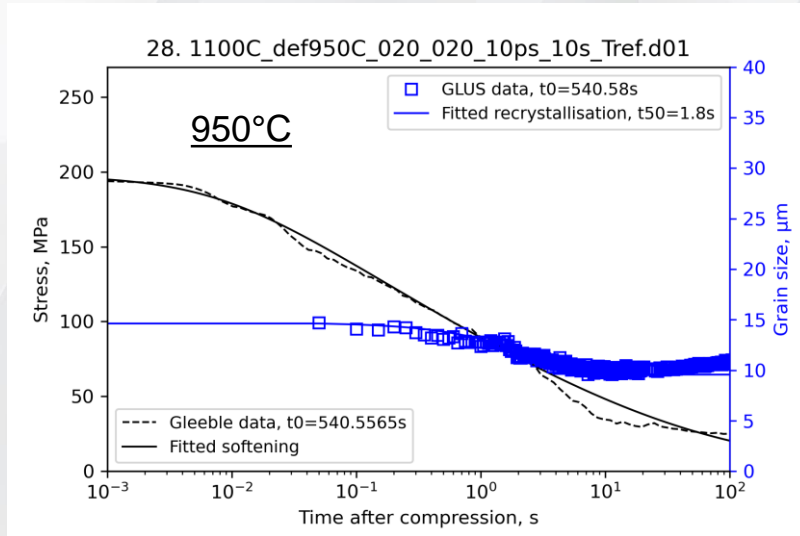


Sample ID	GS incl. Σ3* RD / TD	GS excl. Σ3* RD / TD
Tref	17 / 17	32 / 32
T25	19 / 18	41 / 36
T50	18 / 16	35 / 33
T75	18 / 16	33 / 32

Contains small amounts of non-recrystallized fraction



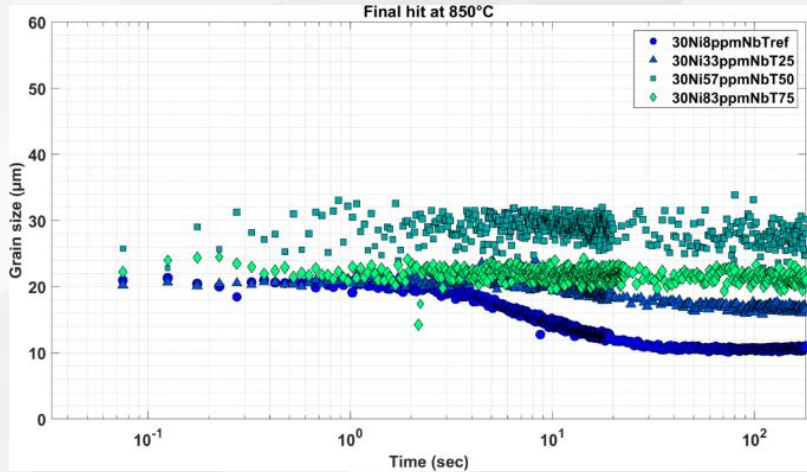
Recrystallization behavior



2x20% deformation at
950C and 850C

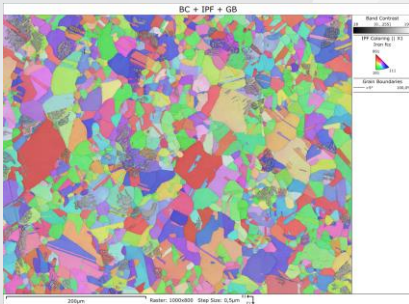


Material after GLUS

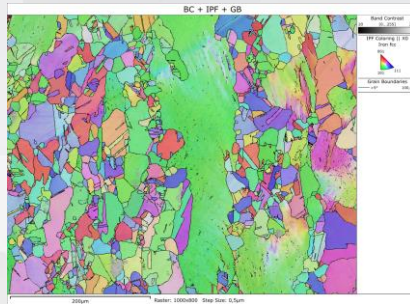


Sample ID	Serial number	Microstructure	GS incl. $\Sigma 3^+$	GS excl. $\Sigma 3^+$	Comment
Tref	30	Recrystallised	8	17	
T25	33	Partially recrystallized	13 10	20 14	Complete dataset Recrystallized only
T50	36	Deformed	37	37	Strictly speaking too small field of view for GS determination
T75	41	Deformed	16	16	Finer microstructure prior to GLUS test than T50.

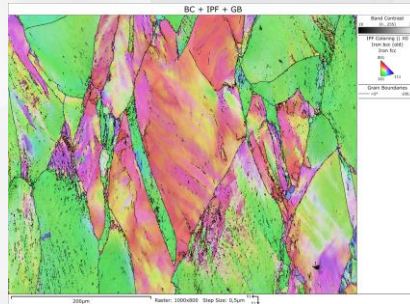
Tref



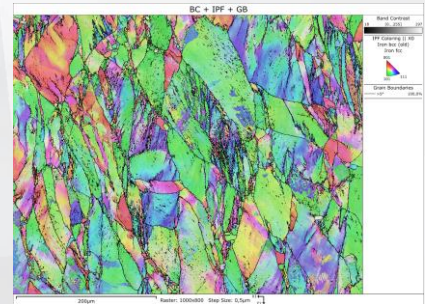
T25



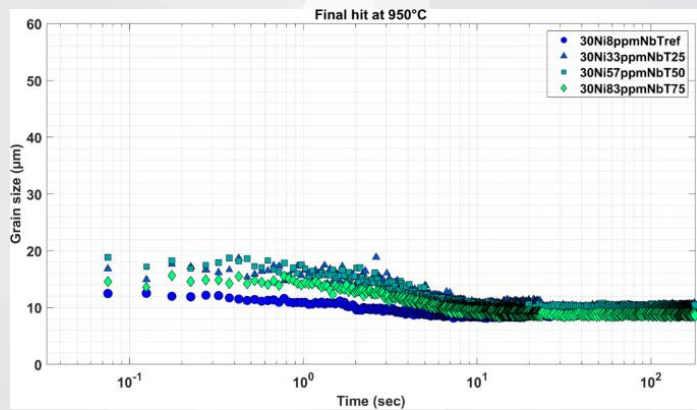
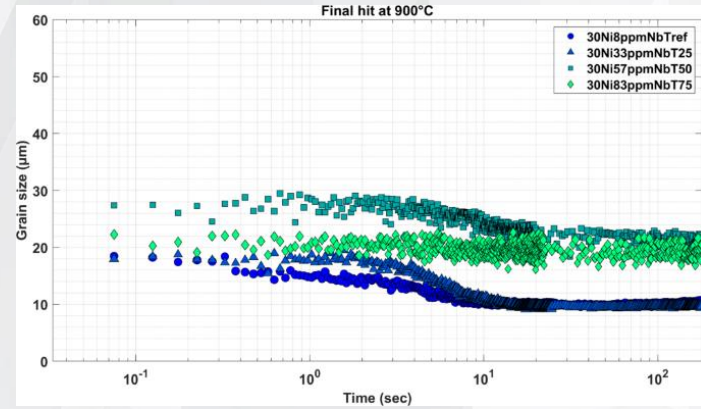
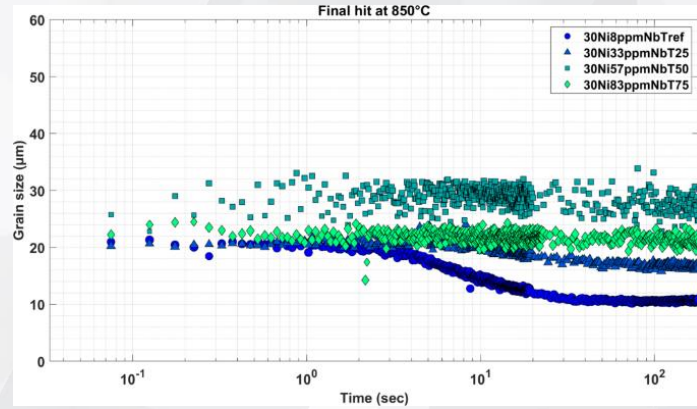
T50



T75



GLUS grain size measurements





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