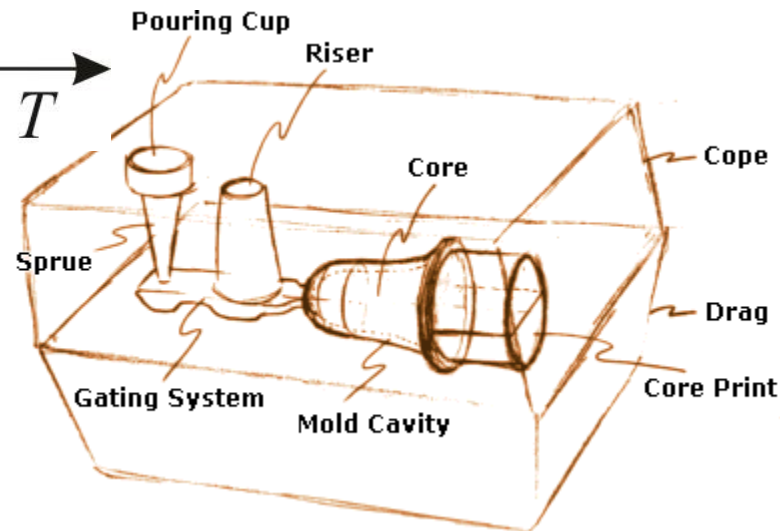
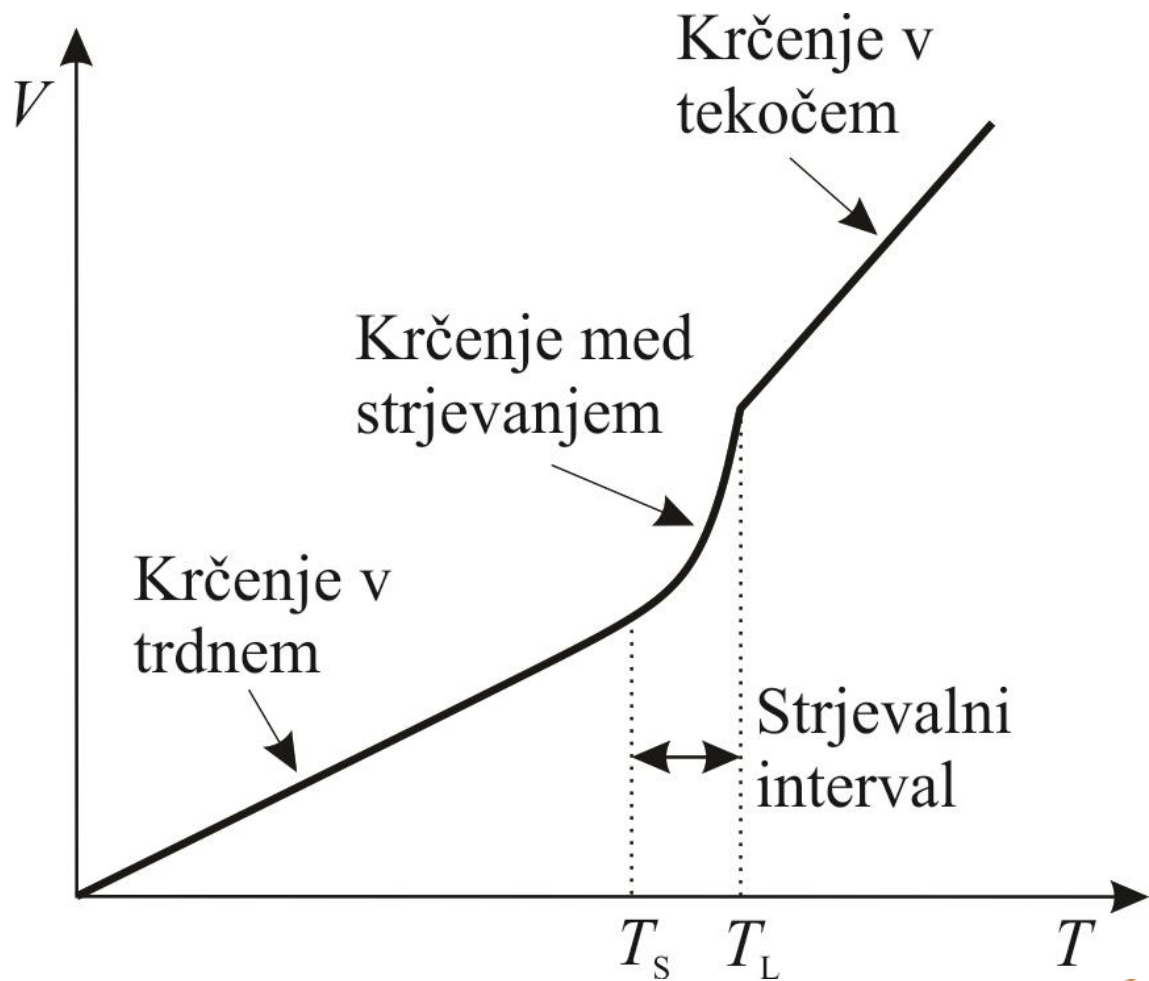


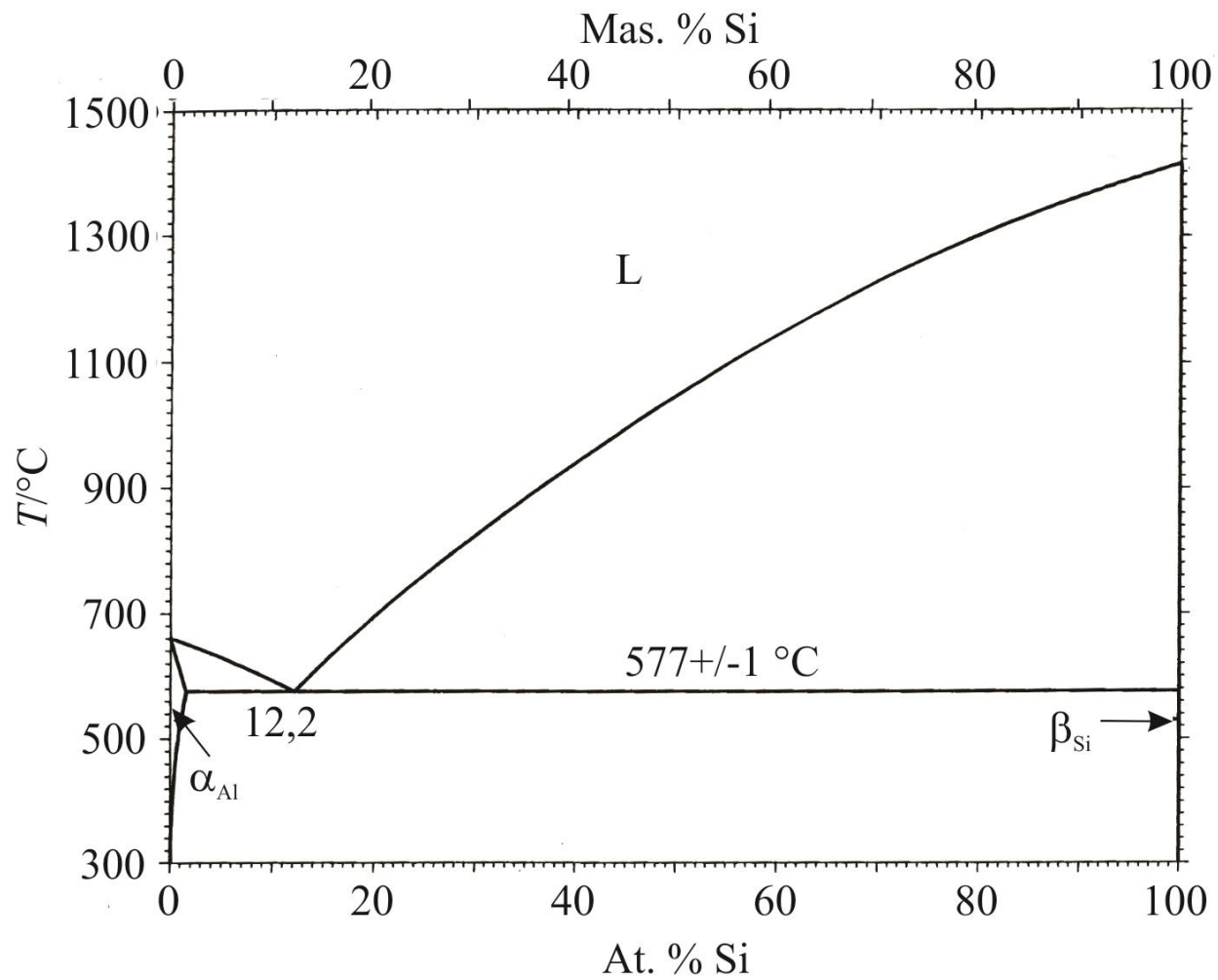
University of Ljubljana
Faculty of *Natural Sciences and Engineering*
Department of Metallurgy and Materials



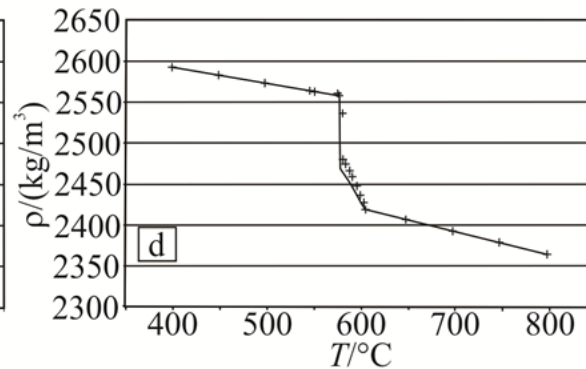
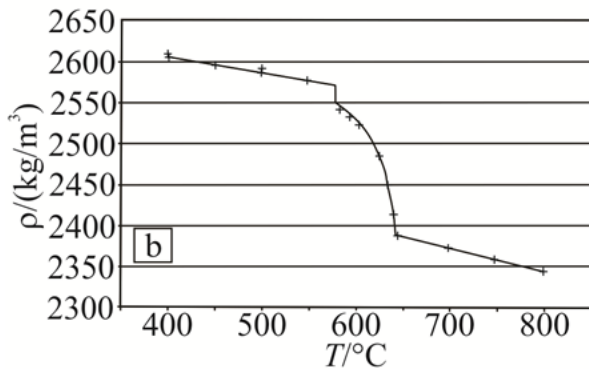
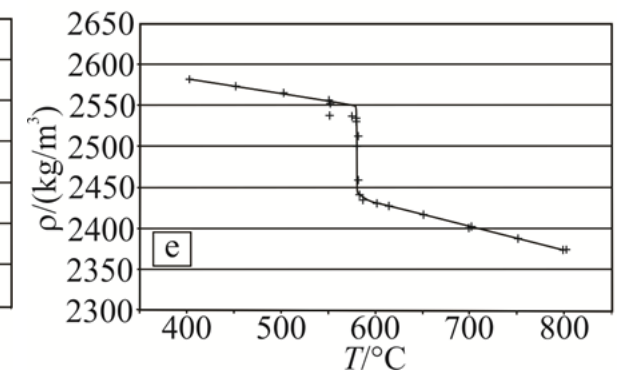
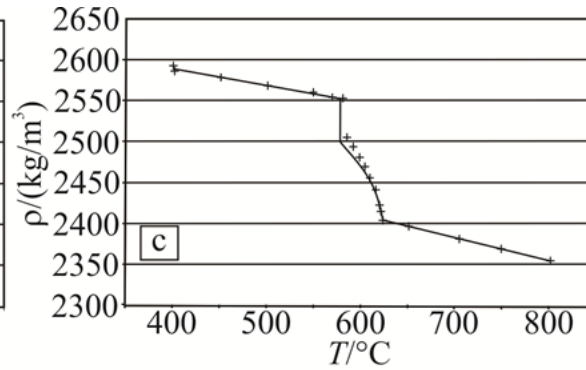
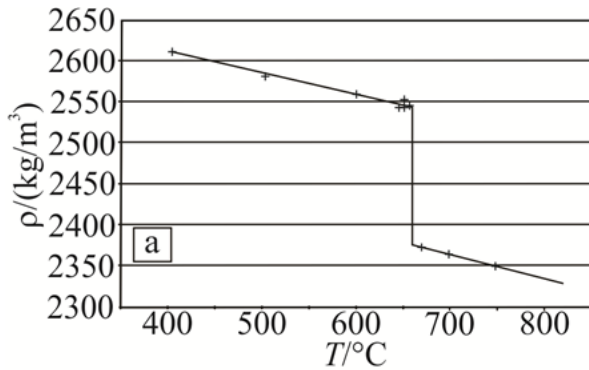
Dilatometrijska analiza Al-Si legura pri skručivanju

Mitja Petrič, Maja Vončina, Sebastjan Kastelic, Primož Mrvar



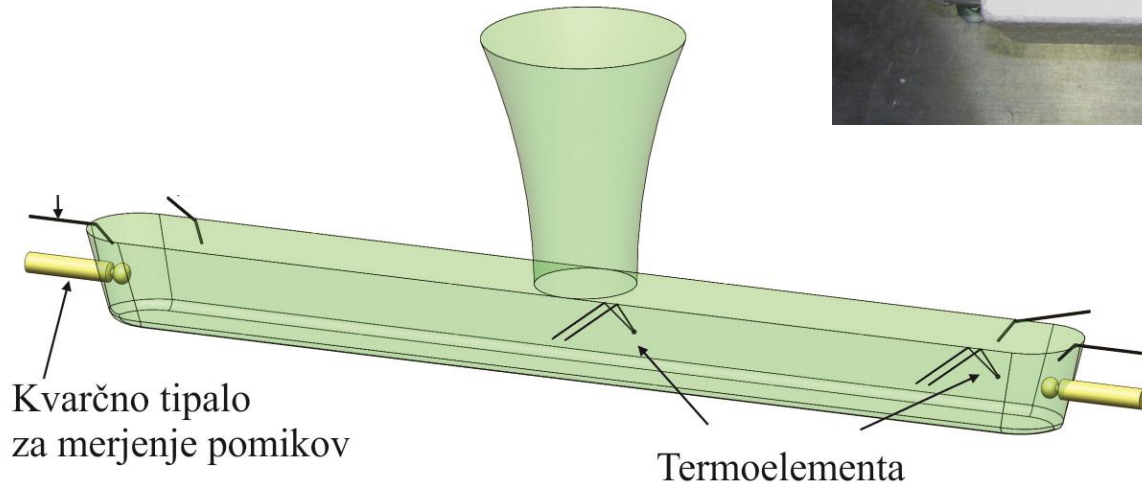


- Shrinkage of Al at solidification: 7,14 %
- Shrinkage of Si at solidification : -2,9 %



- (a) Al – 7,14 %
- (b) AlSi3 – 6,3 %
- (c) AlSi6 – 5,4 %
- (d) AlSi9 – 5,2 %
- (e) AlSi12 – 4,4 %

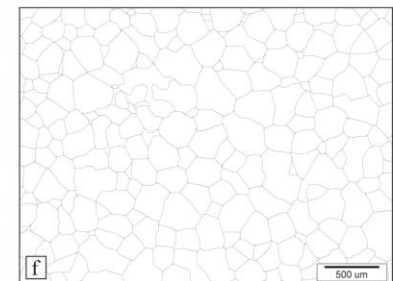
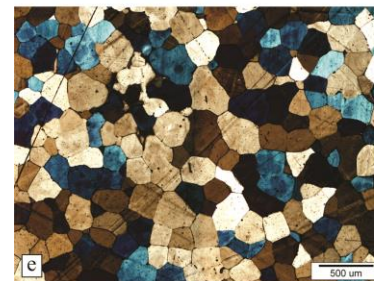
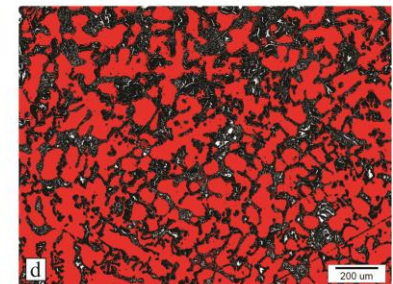
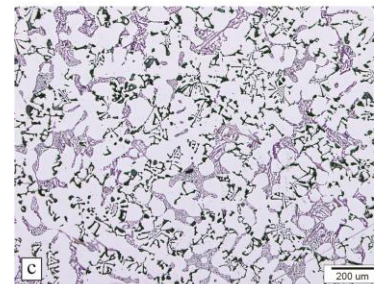
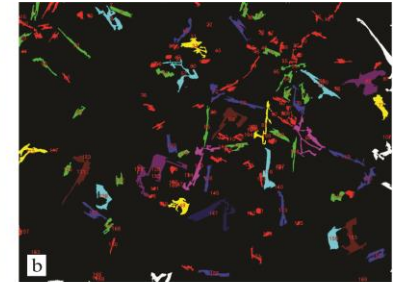
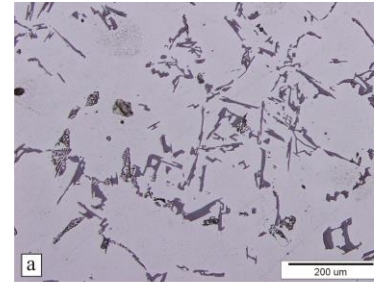
Measuring cell



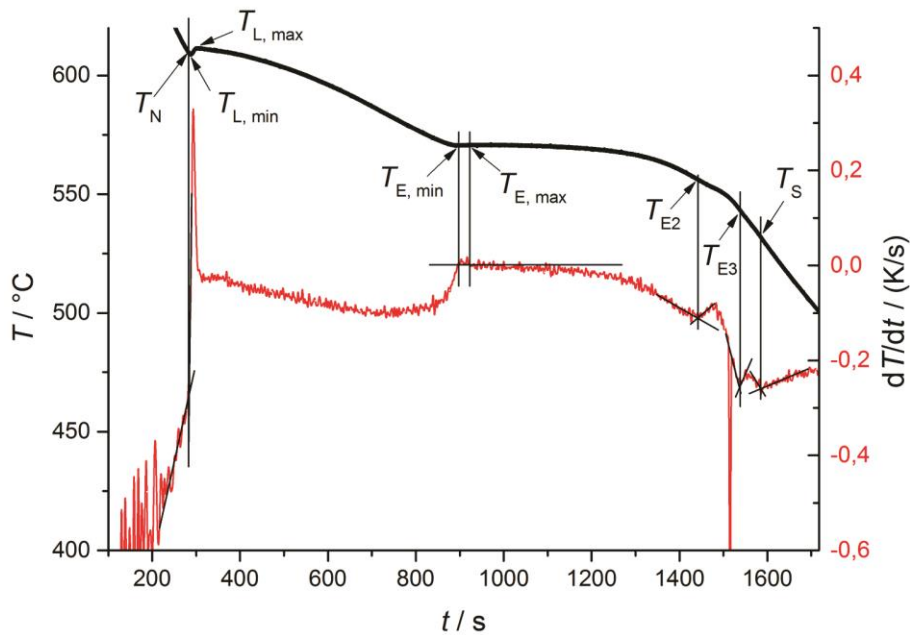
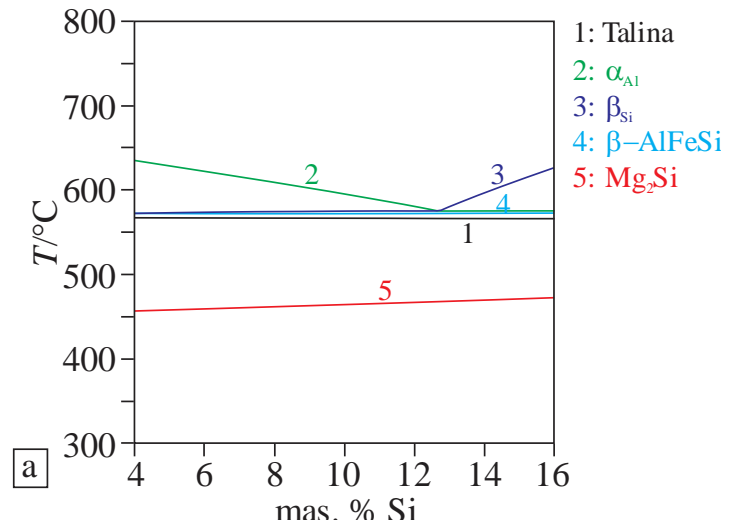
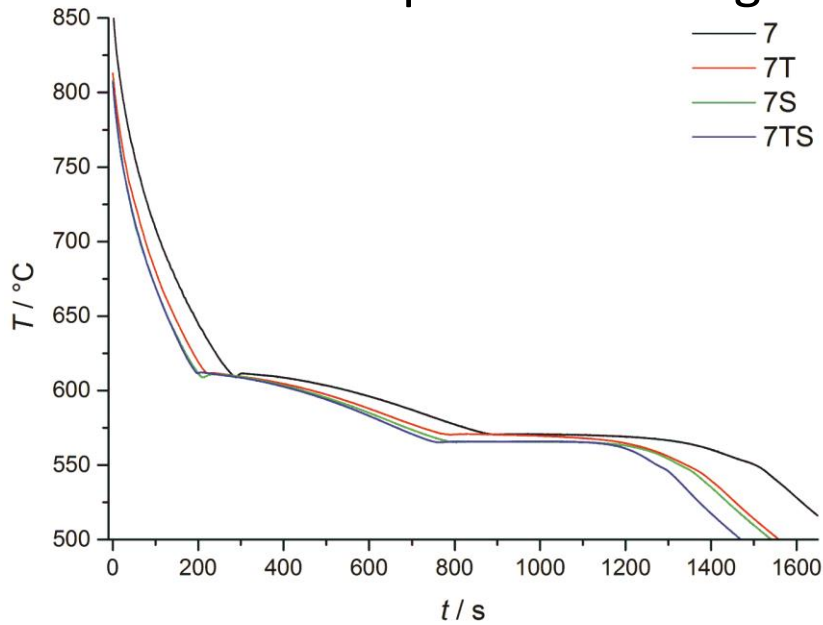
Experimental

- AlSi7Mg
- AlSi12
- + Ti, Sr
- $T_p = 800\text{ }^\circ\text{C}$

- Thermodynamic equilibrium calculation
- SEM
- Optic microscopy
- X-ray analysis

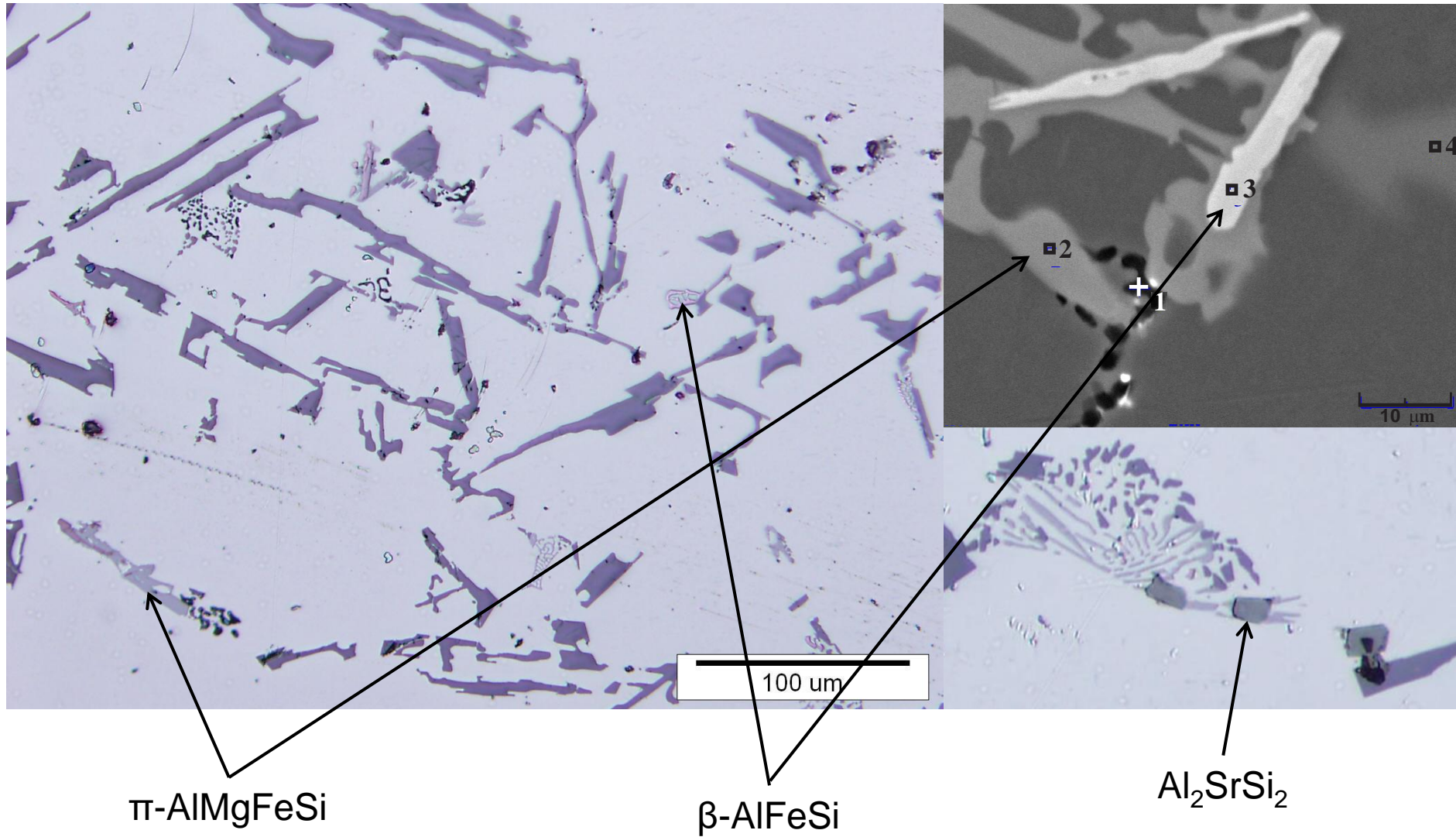


Solidification path – AlSi7Mg

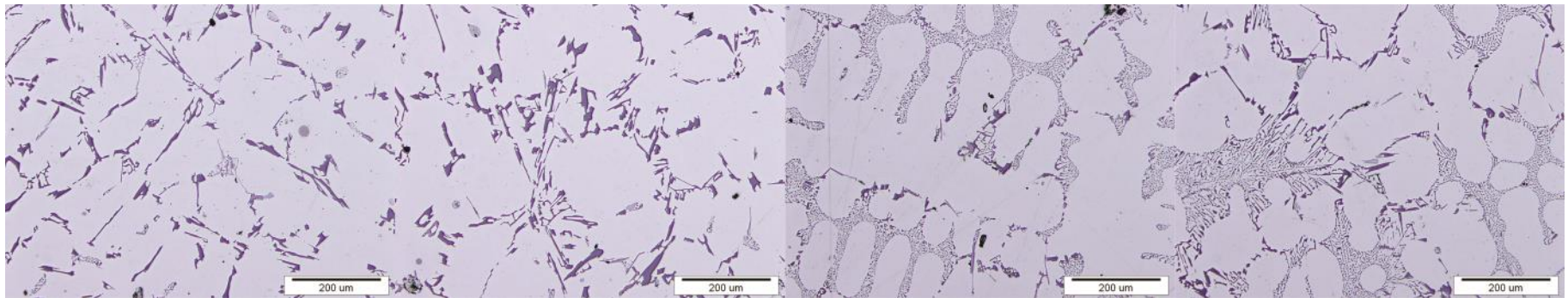
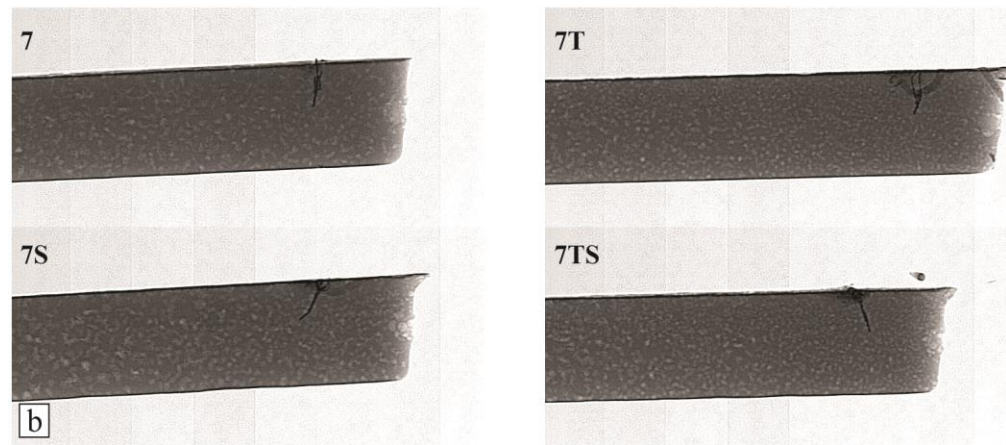
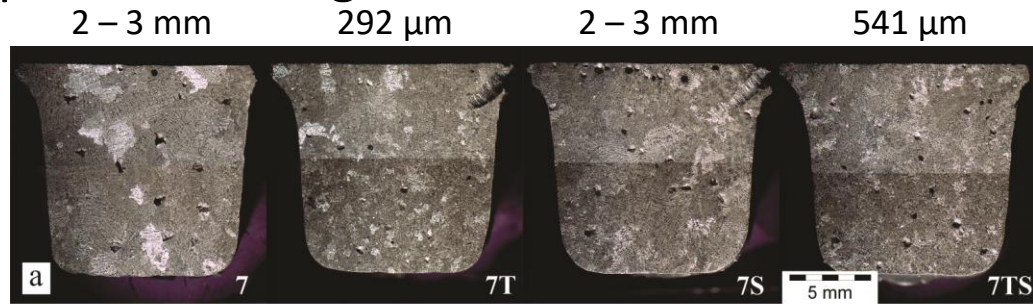


- $L \rightarrow \alpha_{Al}$
- $L \rightarrow (\alpha_{Al} + \beta_{Si} + \beta\text{-AlFeSi})$
- $L \rightarrow (\alpha_{Al} + \beta_{Si} + \beta\text{-AlFeSi} + Mg_2Si)$
- $L \rightarrow (\alpha_{Al} + \beta_{Si} + \beta\text{-AlFeSi} + Mg_2Si + \pi\text{-AlMgFeSi})$

Solidification path – AlSi7Mg



Solidification path – AlSi7Mg



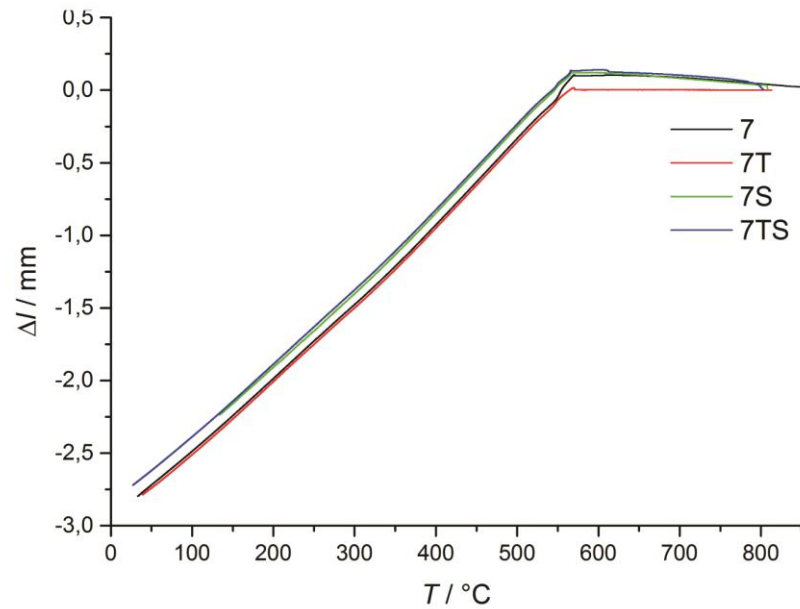
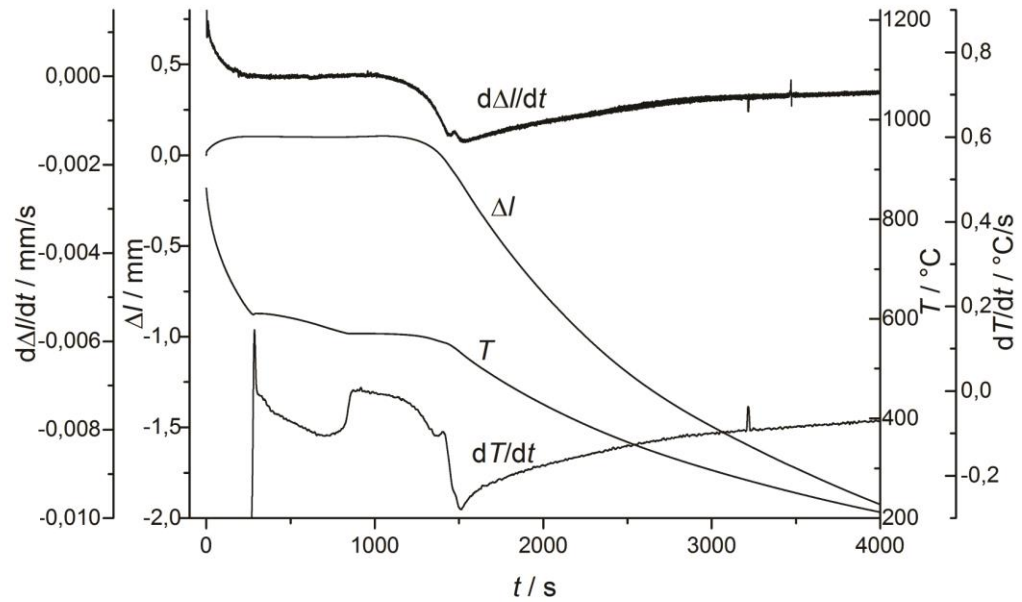
29,7 μm

32,9 μm

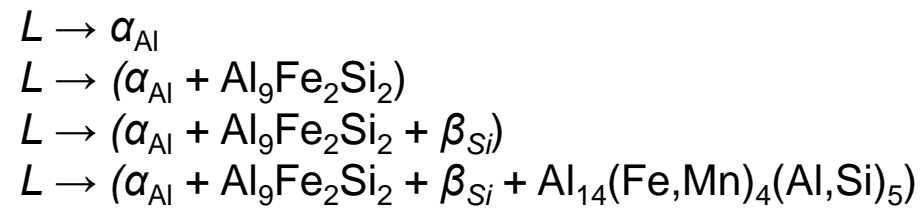
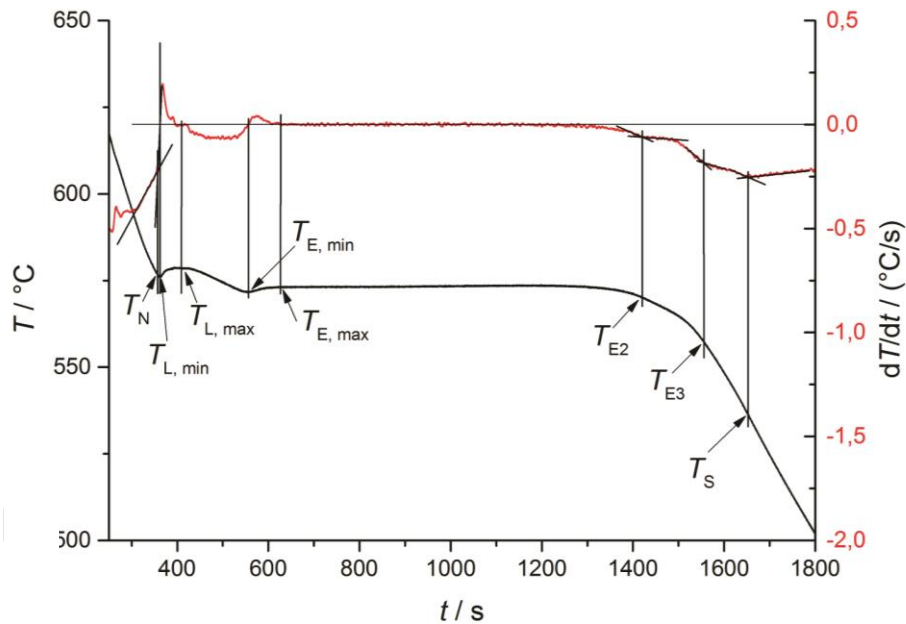
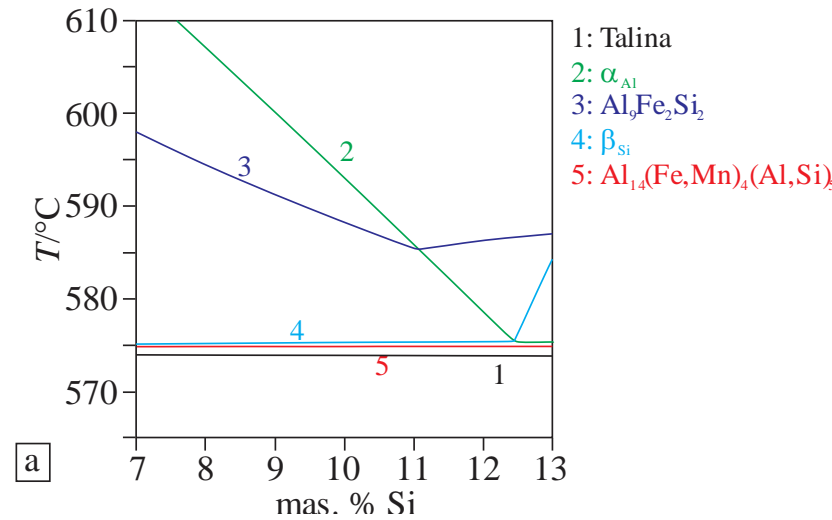
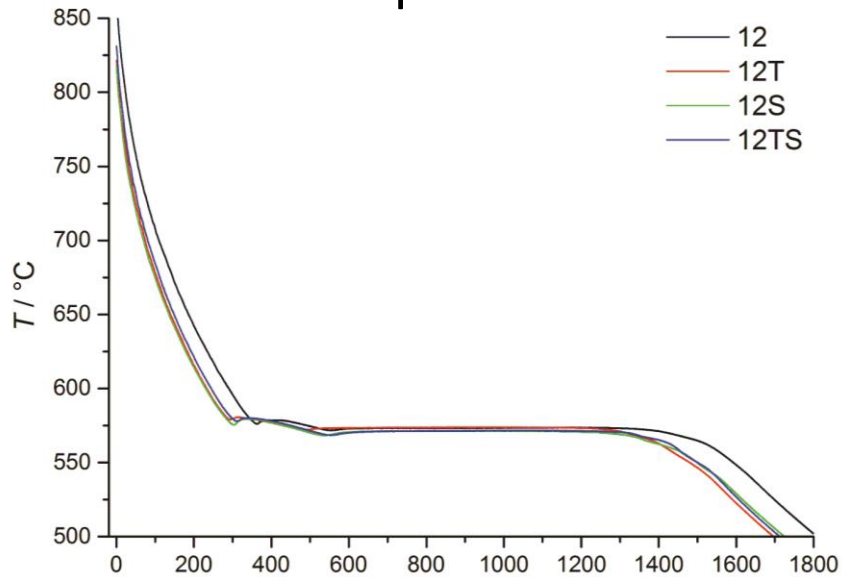
6,0 μm

20,7 μm

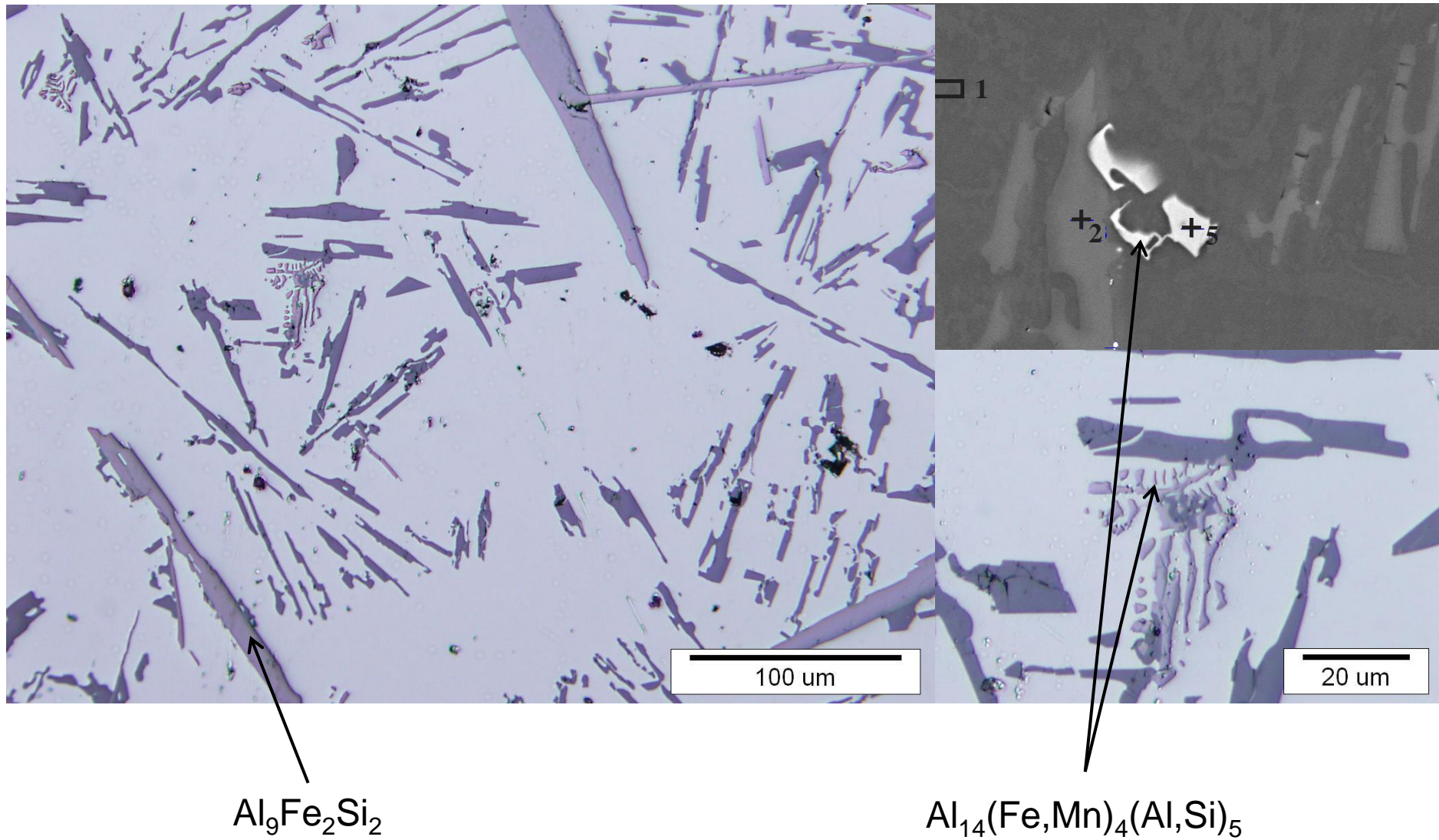
Dilatometric analysis – AlSi7Mg



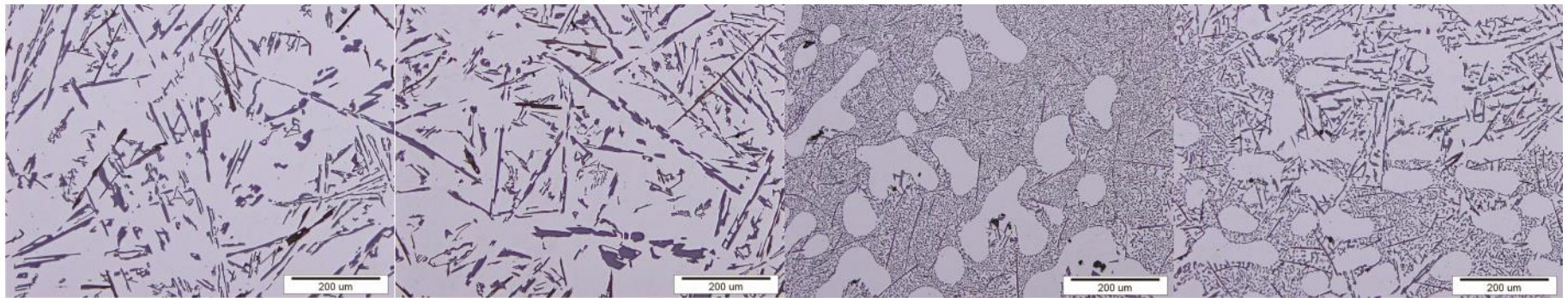
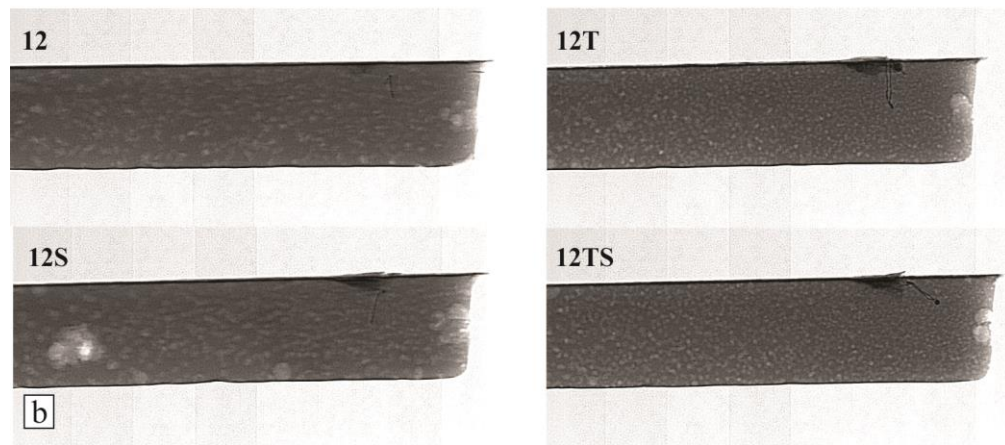
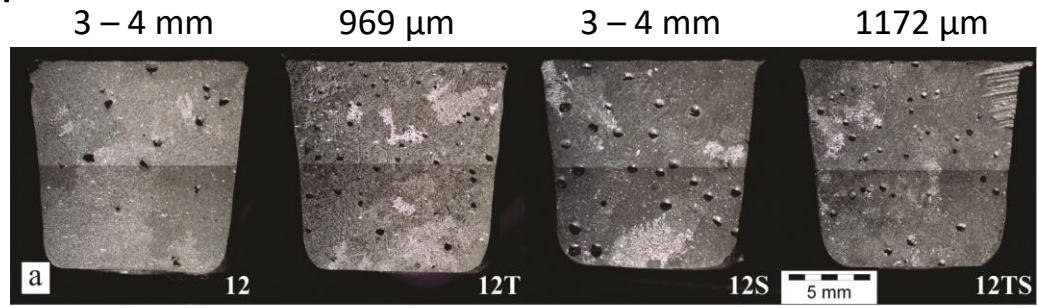
Solidification path – AlSi12



Solidification path – AlSi12



Solidification path – AlSi12



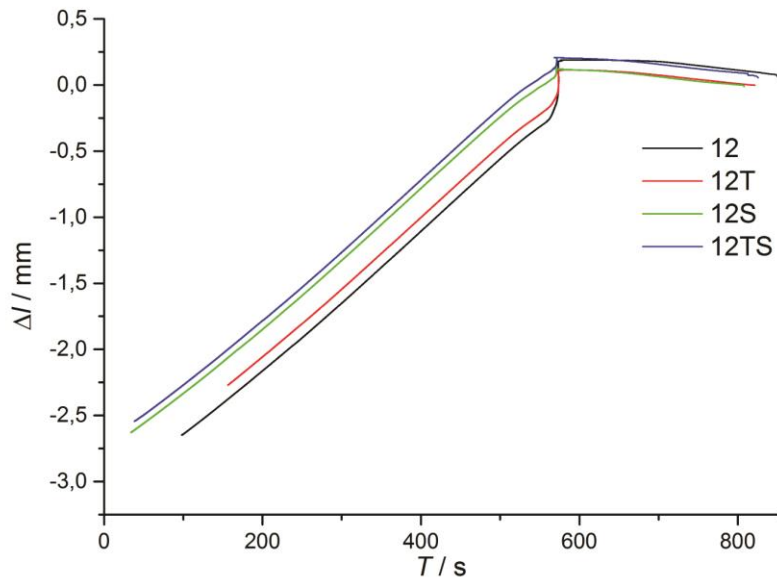
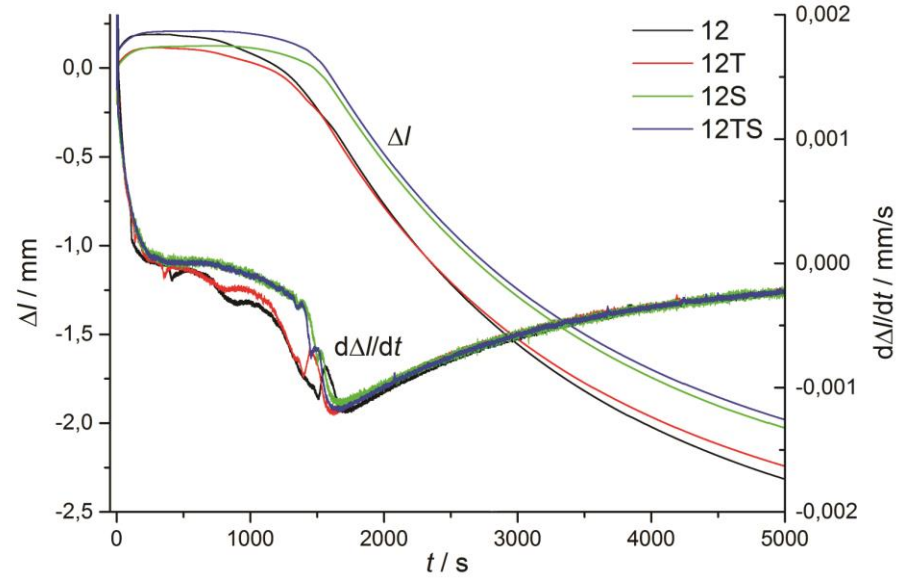
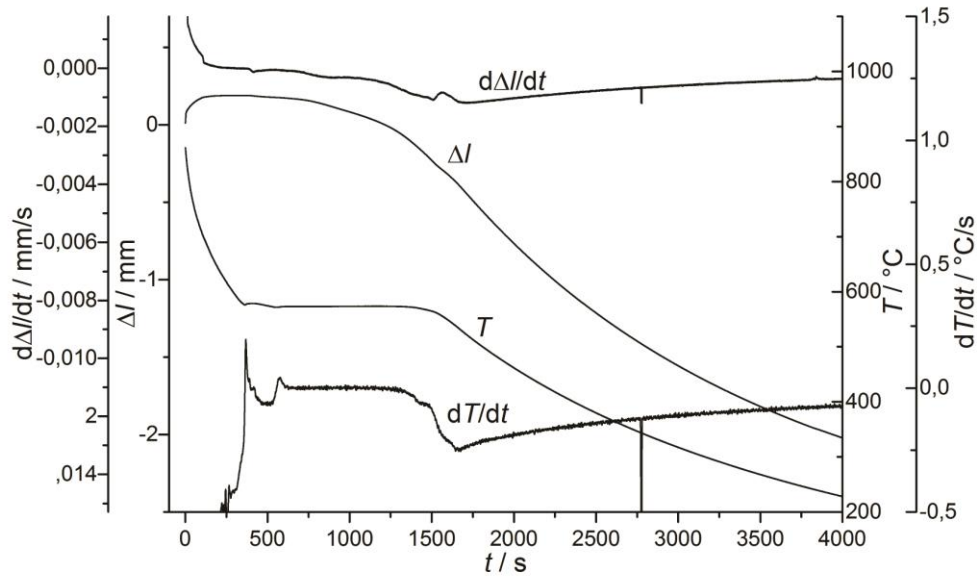
40,0 μm

39,1 μm

3,9 μm

11,8 μm

Dilatometric analysis – AlSi12



Conclusions

- Grain refining and modification has no effect on AlSi7Mg alloy
- Modification has effect on solidification and shrinkage of AlSi12 alloy