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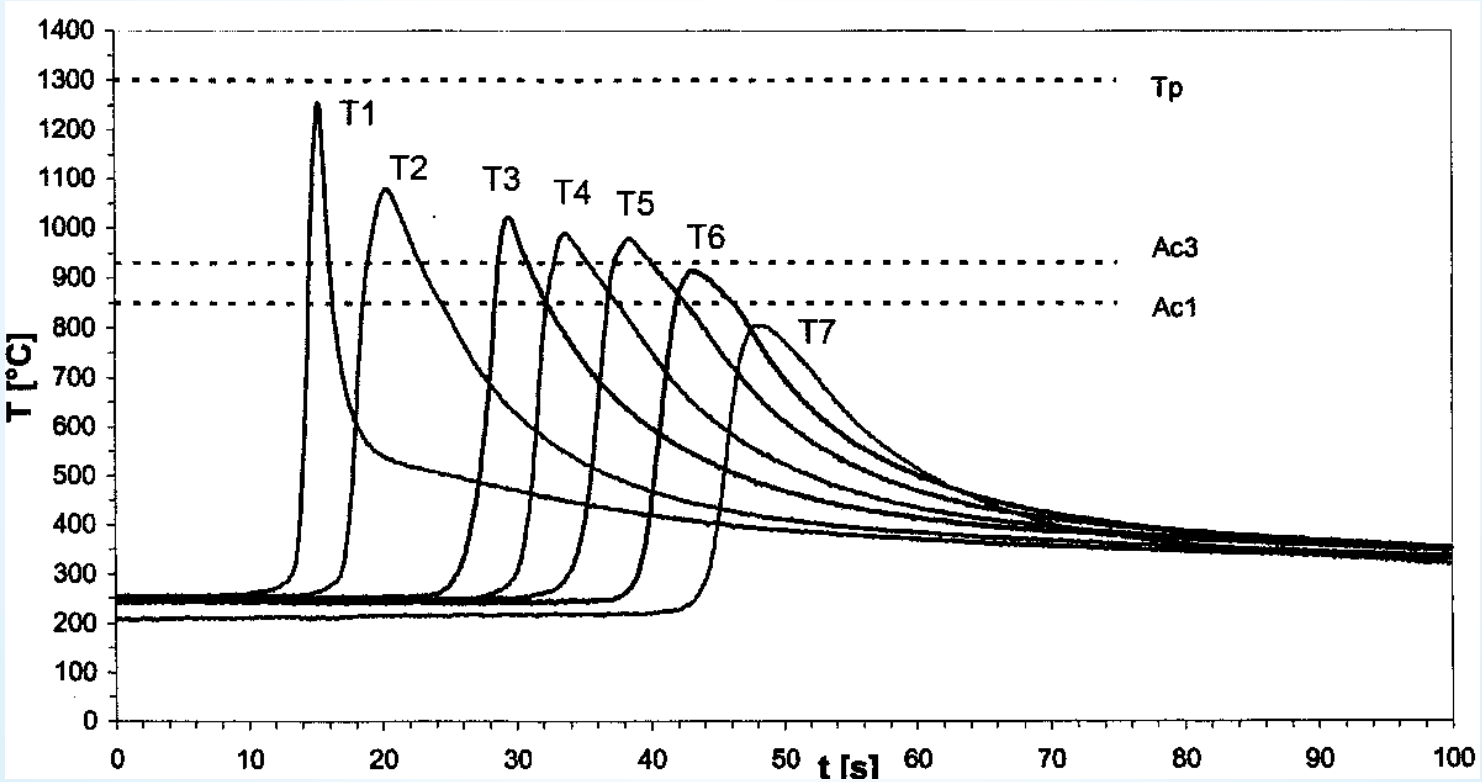
MODULE A
Introduction to the problems of welding

Thermal welding cycle

Thermal welding cycle

- The influence of concentrated heat source used for fusion welding on the structure and properties of welded joints assessed using so-called thermal cycles during welding.
- Use temperature cycles is important to investigate the weldability of the materials, to study the mechanical properties and microstructure observation for the weld.
- Temperature cycles during welding
- Heat sources operating in the weld area are the cause of temperature cycles.
- The temperature cycle is a plot of temperature versus time during the considered spot weld.
- Typical during the temperature cycles in HAZ weld joint P91 steel at different distances from the limit setting is shown in Figure.

During the temperature cycles

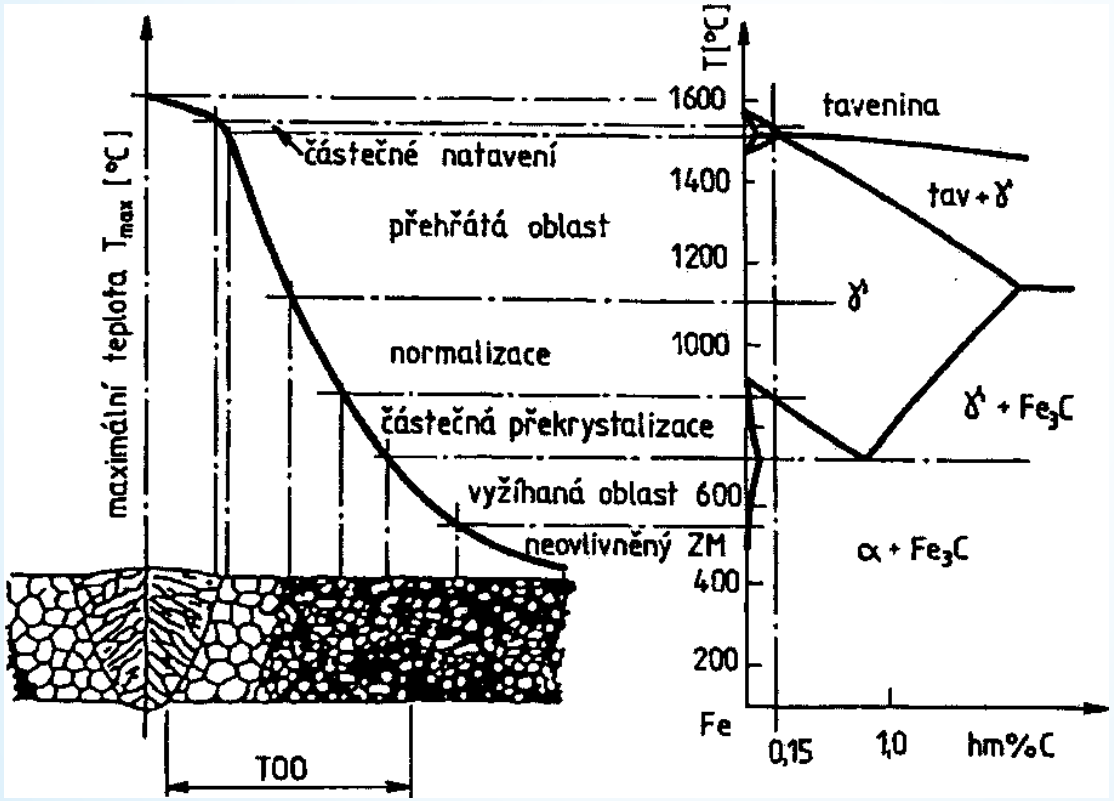


KOUKAL, J., SCHWARZ, D., HAJDÍKJ. *Materials and weldability*. 1st ed. Ostrava: VSB - Technical University of Ostrava, 2009. p. 16.

During the temperature cycles.

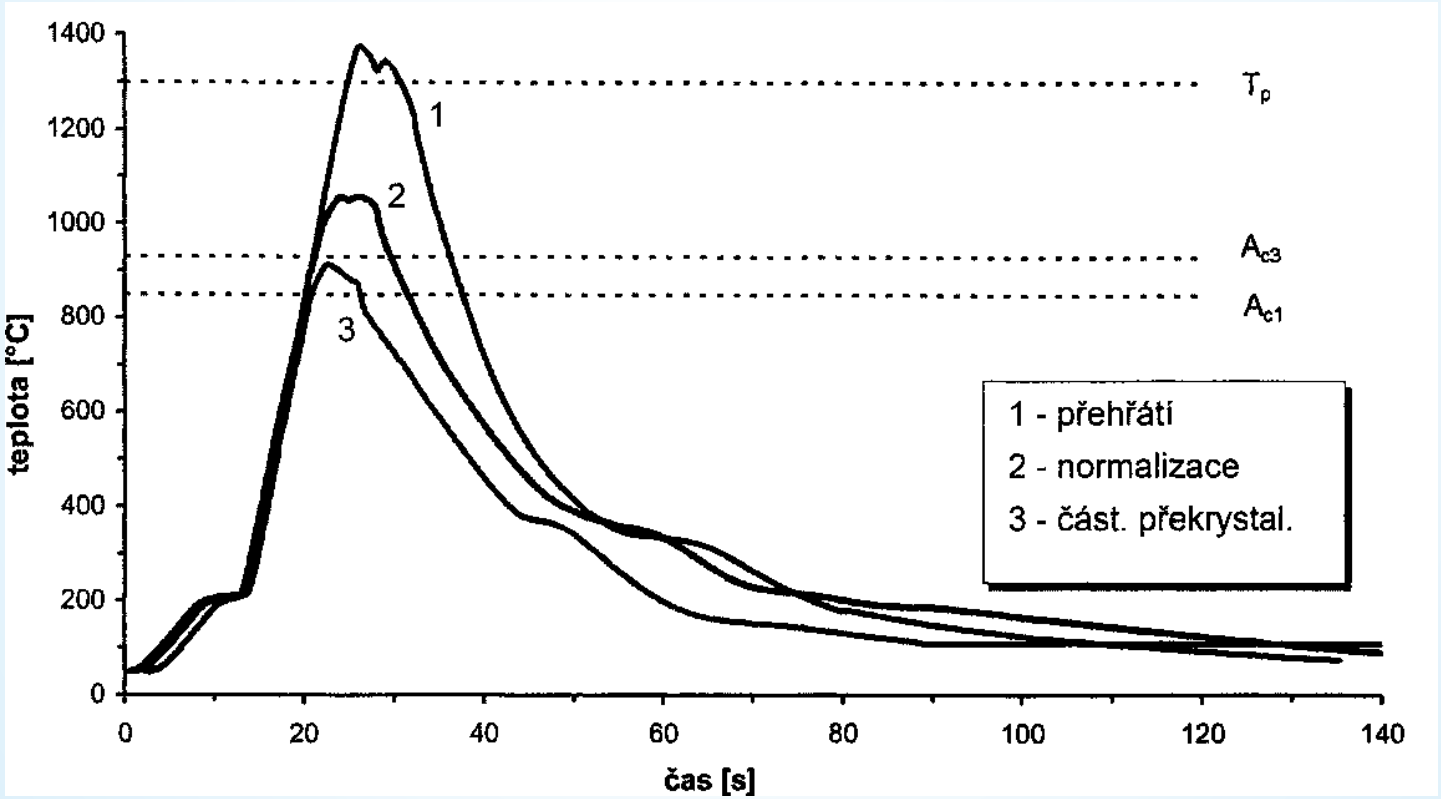
- The increase from the initial temperature up to the maximum temperature is called the temperature cycle.
- Speed heating depends on many factors: e.g. welding technology, the heat source.
- For example technology at the heating rate is 111 300 ° C / sec to 400 ° C / s.
- At pulse welding electric resistance is higher than 1000 ° C / s.
- At cutting oxygen reaches 1,750 ° C / sec.
- After reaching a maximum temperature leads to the cooling phase of the temperature cycle in which the temperature change also depends on the properties of the material, technology and conditions.

Influence of the temperature cycle of welding at the welded joint structures



KOUKAL J. SCHWARZ, D. HAJDÍKJ. *Materials and weldability.* 1st ed. Ostrava: VSB - Technical University of Ostrava, 2009. p. 19.

Temperature versus time zones modeled TOO P91 steel



KOUKAL J. SCHWARZ, D. HAJDÍKJ. *Materials and weldability*. 1st ed. Ostrava: VSB - Technical University of Ostrava, 2009. s. 27th