

ELectroThermal Analysis program ELTA 7.0

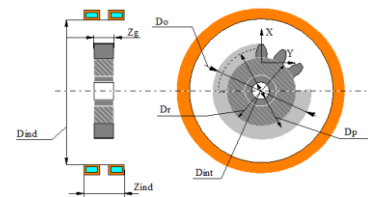
ELTA is an effective tool for design of induction processes and whole systems, research, education, etc.

Specific features of ELTA:

- User friendly interface with fast and accurate solver
- Coupled 1D & 2D numerical Electromagnetic + Thermal simulation of non-linear induction systems
- Multilayer parts with arbitrary initial temperature
- Axisymmetric (OD & ID) & plane-parallel geometries
- Special module for simulation of internal coils
- Module for simulation of scanning processes
- Module for GEAR, single and dual frequency
- Module for Transverse Flux induction Heating
- Possibility to account for the power supplying circuit (buswork, capacitors, transformer)
- Databases with non-linear properties of materials to be heated
- Possibility to insert TTT or CCT diagrams in Quenching graphs
- Unique database of heat transfer coefficients for different quenching media
- Option of automatic frequency variation
- Automatic report generation according to selected or created templates
- Simulation of multi-stage processes
- Calculation of the coil water cooling
- Multiple preinstalled Tasks and Templates



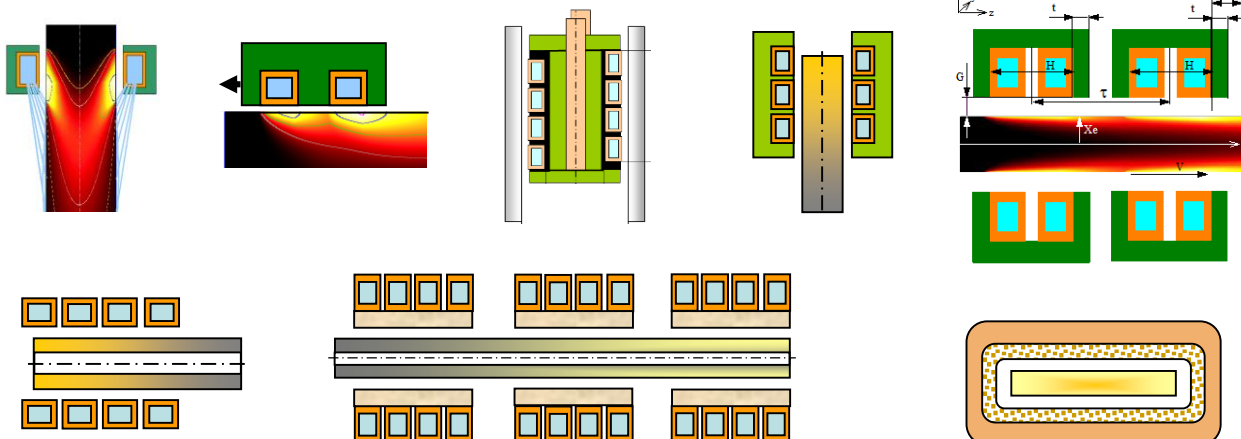
New: gear task template



Typical induction systems simulated with ELTA 7.0

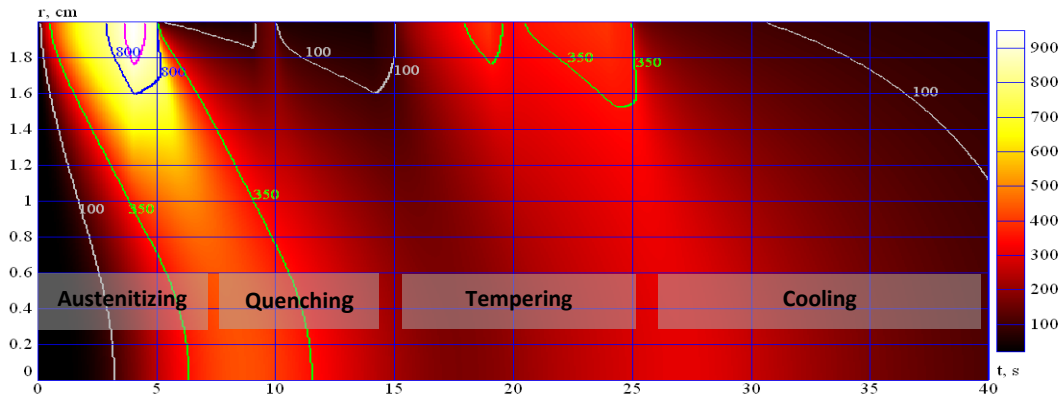
Tasks pre-installed in ELTA 7.0

1. **Example1_Fconst** – tube heating in one coil at constant frequency
2. **Example2_Fvar** – tube heating in one coil at variable frequency
3. **Furnace Heating** – bar heating in resistance or flame furnace
4. **Heattreat** – local bar end hardening with quench delay
5. **Internal 1 Turn** – internal surface heating by single-turn inductor, with magnetic core
6. **Internal 1 Turn_No Core** – hardening of internal surface by single-turn inductor, no magnetic core
7. **Internal 4 Turns** – heating for tube brazing by 4 turn inductor
8. **Massheat Periodic** – bar end heating in two inductors with different frequencies
9. **Massheat in Line** – accelerated precise heating of bar in 4 inductors to 1200 °C
10. **Scan_Hair Pin** – scan hardening of a plate by a single-turn hair-pin inductor at 100 kHz
11. **Scan_Single Turn** – scan hardening of shaft in a single turn inductor with concentrator
12. **Slab_Fe** – slab heating in line containing 3 inductors
13. **Surftreat in Line** – optimal process of bar hardening and tempering (11 stages)
14. **Tube Heating** – simulation of tube heating and transportation
15. **TFIH** – Transverse Flux induction Heating for aluminum
16. **TFIH** – Transverse Flux Induction Heating for stainless steel
17. **GEAR** – Induction Heat Treatment – single frequency template
18. **GEAR** – Induction Heat Treatment – dual frequency template

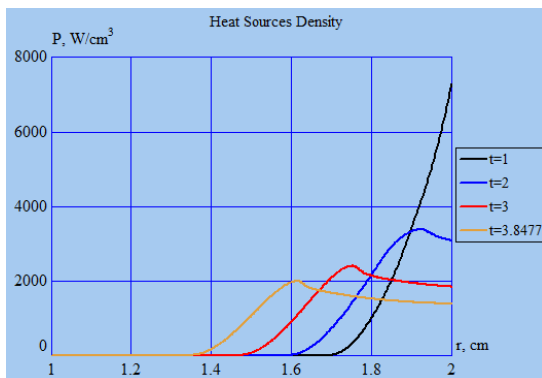


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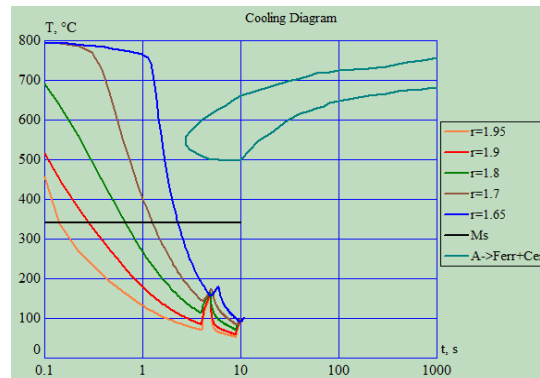
Map temperature and the possibility to insert the CCT diagram in the cooling curve helps the design and prediction of expected micro for the selected material. Material data base can be easily update.



Temperature color map for in-line heat treating of the rod end

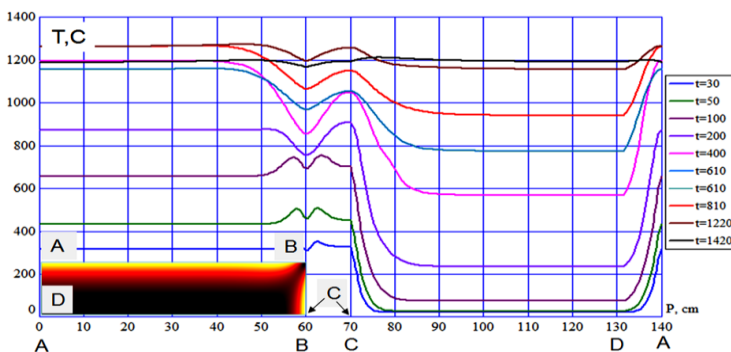


Power distribution at different instances of heating



Cooling graph and CCT diagram for steel 1040

ELTA 7.0 has block for 2D Electromagnetic and Thermal simulation of heating the bodies with rectangular cross-sections (slabs, plates, strips). A semi-analytical Total Flux method is used to count for a finite length of the system in the same way as in ELTA 7.0 1D.



Temperature distribution along the perimeter of a quarter of the slab cross-section in the process of accelerated 4-stage heating of steel slab before hot rolling.

Find more information about ELTA 7.0 and new program 2DELTA as well valuable information about induction heating, coil design and computer simulation on a website www.nsgsoft.com.



Software for Induction Heating

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