



HFM
High Field Magnets

Work Package WP4.2

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WP4.2: Structural materials

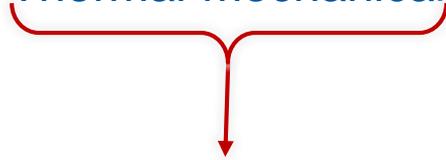
The WP4.2 scope is the following:

- I. Inventory and thermal-mechanical characterisation of structural materials.
- II. Development and characterisation of next generation of structural materials.



I. Inventory and characterisation of structural materials

Thermal-mechanical characterisation of structural materials:



Basic parameters:

- Young's modulus, Poisson coefficient, yield strength, ultimate strength, coefficient of thermal expansion,
- Thermal conductivity, specific heat capacity

Stainless steel
Iron
Copper
Titanium

Possible other parameters:

- Magnetic permeability
- Electrical resistivity
- Fracture toughness,...

As a function of temperature in the 4.2-925K range.

A lot of data is already available but not always consistent. Part of the job will be to review and compare all these data and then select and compile them in a common database.



II. Development and characterisation of next generation of structural materials

Survey of new materials based on needs and functional specifications:

- ↳ New for superconducting magnets but available on the market.
- ↳ New material to be developed if required, not on the market.

Thermal mechanical characterisation of these new materials.



WP4.2 plan for 2023 is the following:

1. Hire a graduate (ORIGIN 2023-2).
2. Inventory of structural materials **presently used** in superconducting magnets (Q2-Q3 2023).
3. Survey and documentation (database) of their thermal mechanical properties (Q3-Q4 2023).
4. Measurements of their missing properties, if needed (from Q4 2023).



Thanks for your attention

