

The background of the slide is an aerial photograph of the EPFL campus. It shows a large, modern building complex situated on a riverbank, surrounded by lush green forests and rolling hills in the distance. A red banner is overlaid on the right side of the image, containing the title text.

# EDIP02 Subsize Coil and Straight Sample - Updates

A dark grey rectangular box is positioned in the lower-left quadrant of the slide, containing the name 'J. Greenwood'.

J. Greenwood

A white rectangular box is located in the bottom center of the slide, containing the date '25.06.2024'.

25.06.2024

## 1. EDIPO2 subsize coil update

- Implications for sample dimensions with a cable bending radius of 50 mm
- Coil current limits with a cable bending radius of 50 mm
- Coil displacement estimations
- Next steps

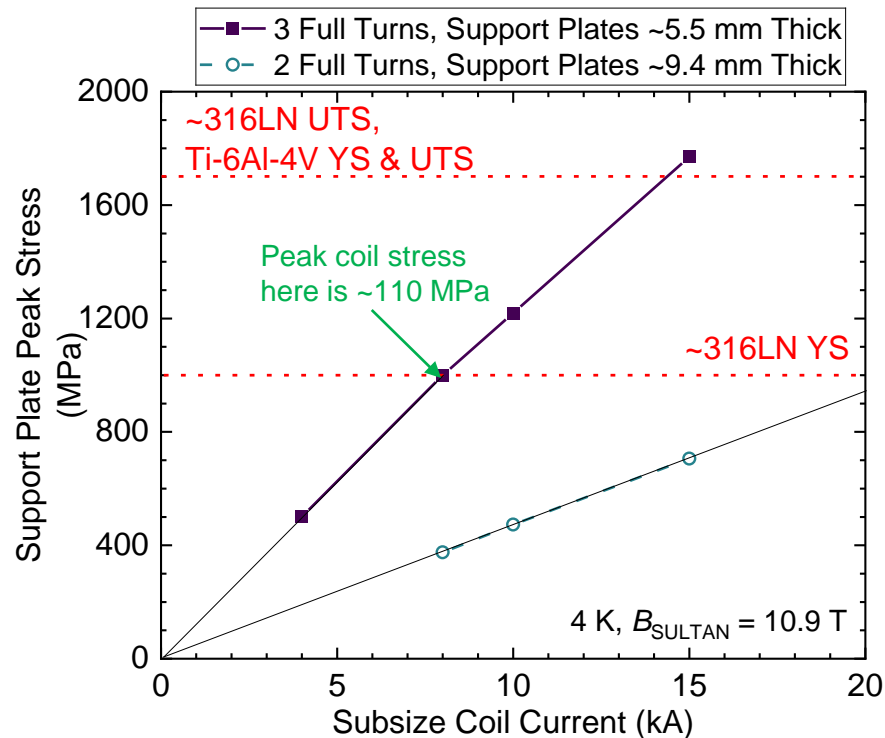
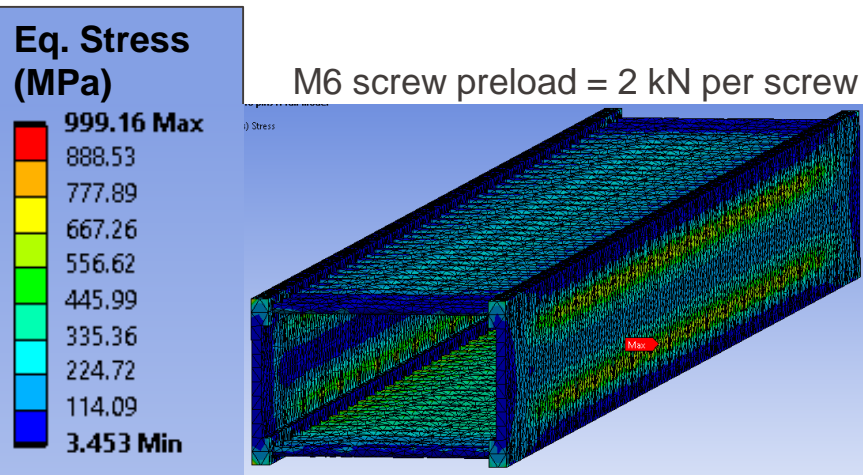
## 2. First look at EDIPO2 straight sample for SULTAN- 3D CAD

Bending trials on the most recent WST and GREMCO cable samples have led to the minimum bend radius for the cable being specified as **50 mm**.

This has implications for the thickness of the coil, its support structure, and the ampere-turns that can be achieved in a SULTAN test.

Minimum Bend Radius	Number of <u>Full</u> Turns, <u>per Layer</u>	Support Plate Thickness, per Plate
50 mm	2	~9.4 mm
	3	~5.5 mm

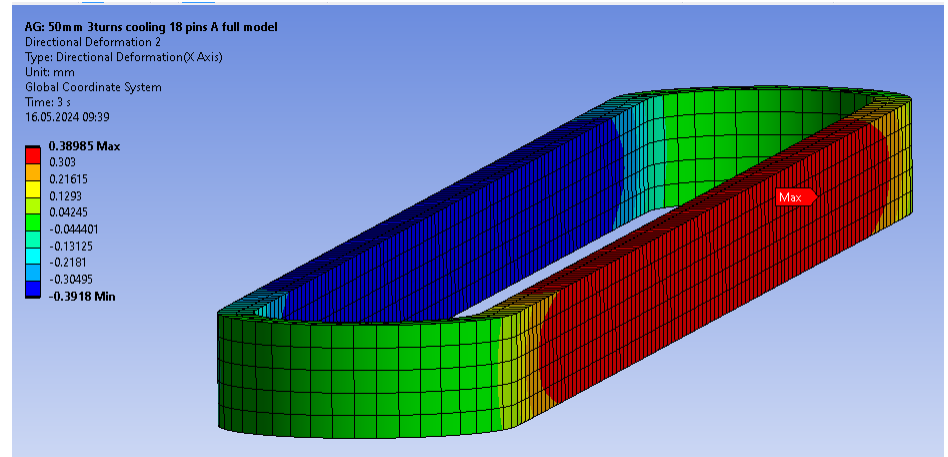
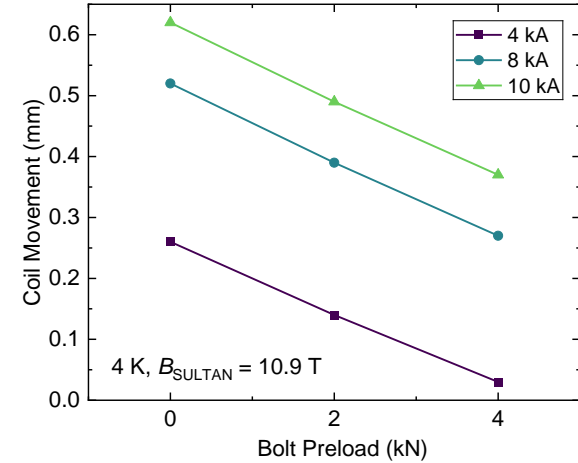
Example below: 8 kA, 3 full turns per layer



The design is limited by the plates

# Coil movement, 3 Turns

Coil movement values during EM loading are similar to that suggested by ASG for their design in the recent Zoom meeting (~0.3 mm)



- Check effects of thermal contraction during cooldown, check cooling performance
- Decision on contract structure for the supplier
- If no further major design changes are anticipated, produce drawings for technical specification(?)

**EDIPO2 Straight Sample for  
SULTAN - Update**





For R&W, the HT is performed at an intermediate bending radius, between straight and the smallest radius in the winding (80 mm).

To adapt a R&W U-bend sample to SPC's furnace **and** the SULTAN test well, i.e.,  $\Phi = 190$  mm heat treatment and u-bend 60 mm radius, the strain would be:

- Straight section: 1.8%
- Bent section: 1%

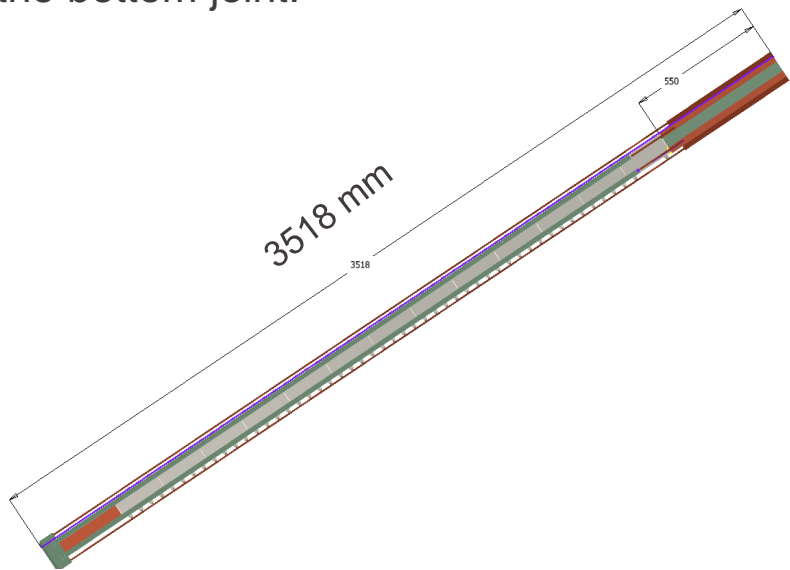
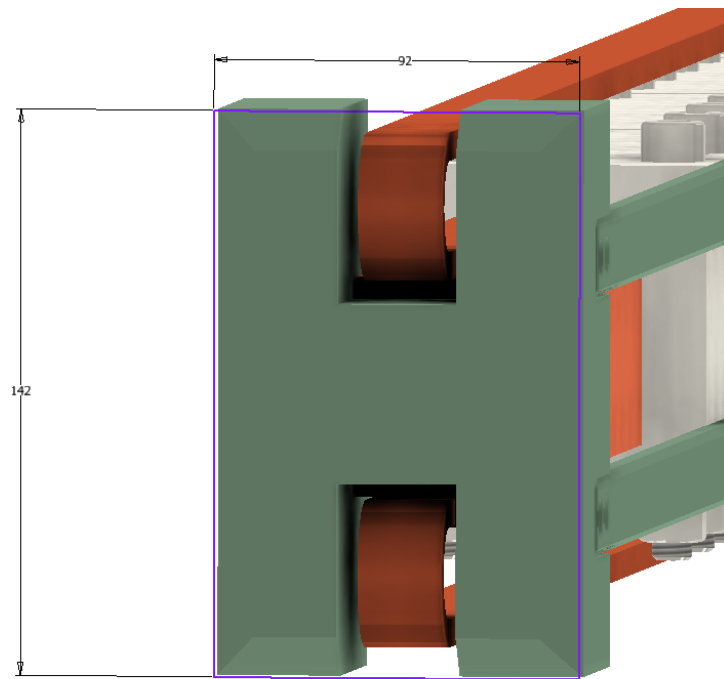
Experiment loses relevance -> react 2 straight sections (+ 2 spares) and include a bottom joint in the sample.

# Straight sample design overview

Designed according to SULTAN User Spec

Cross section 92 mm x 142 mm to allow 1 mm insertion gap

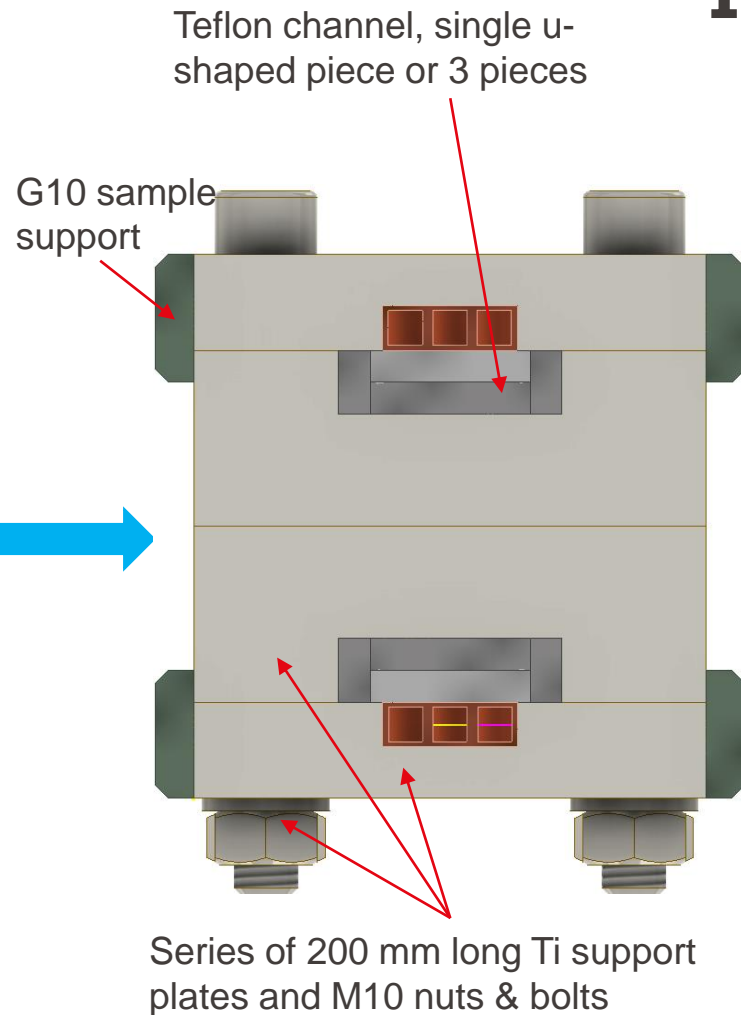
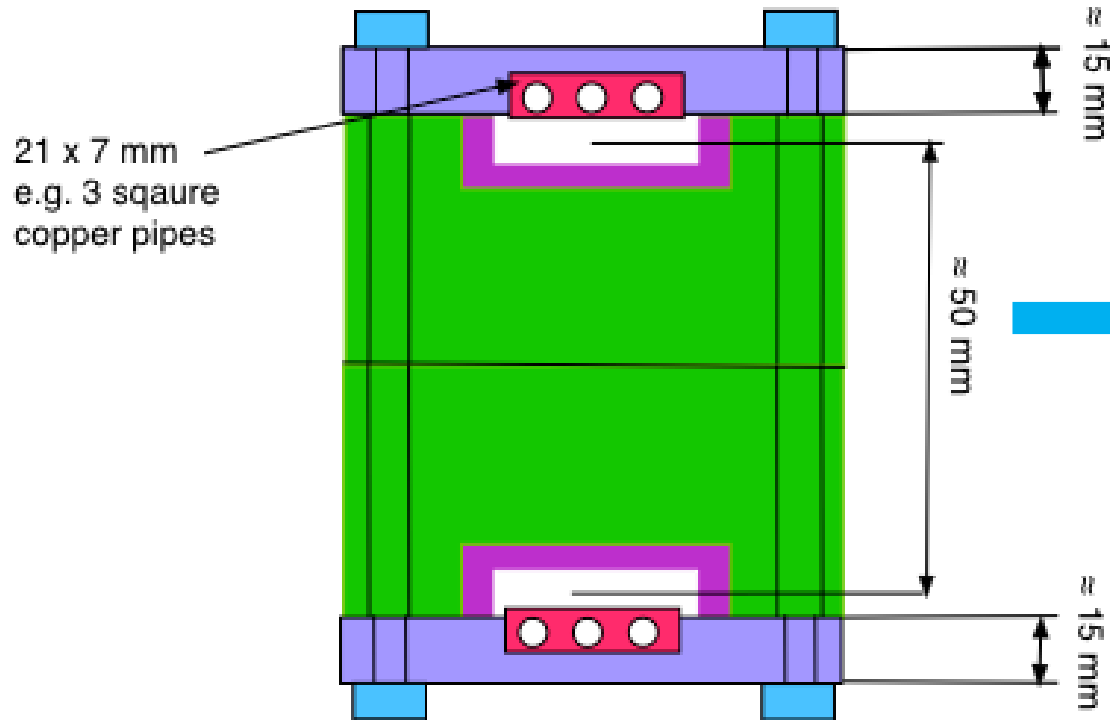
The sample is currently 3518 mm long, from top of Cu terminal to bottom of G10 spacer attached to the bottom joint.



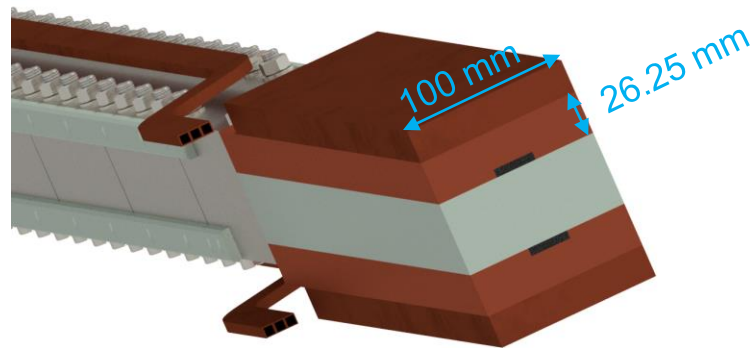
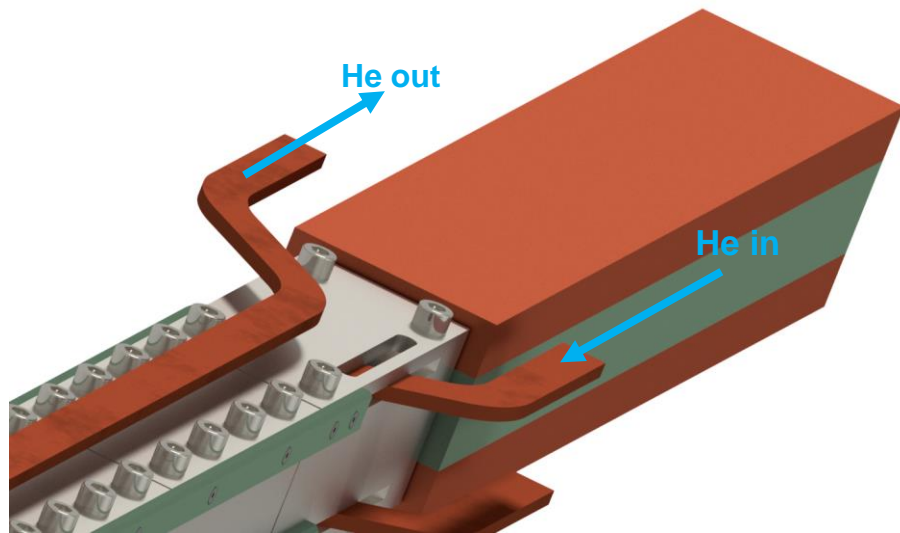
.stp CAD file is in 7007/Greenwood.

# High field zone cross section

Reproduced from PB's memo, dimensions are the same

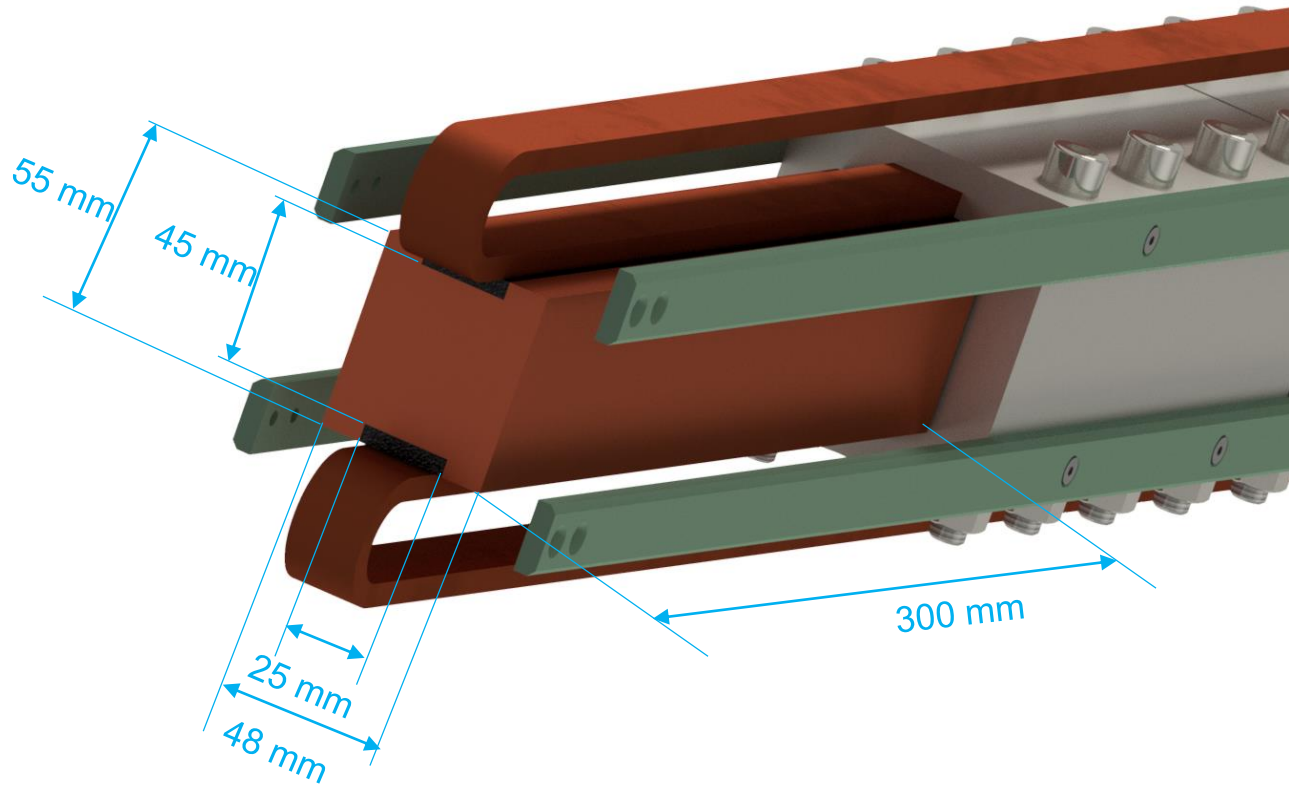


Cu pipes enter the sample just beyond the terminals, in the first 200 mm Ti section



# Bottom joint region

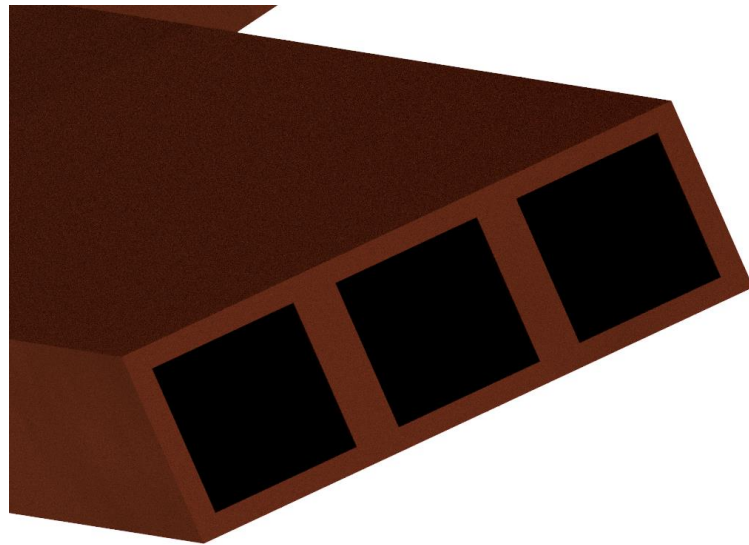
(with the G10 spacer at the bottom removed)



Very simple design in the CAD model for now, 3x  
7 mm square Cu pipes, treated as single object

Possible alternative: Metalkraft Technologies,  
USA

<https://metalkrafttechnologies.com/>

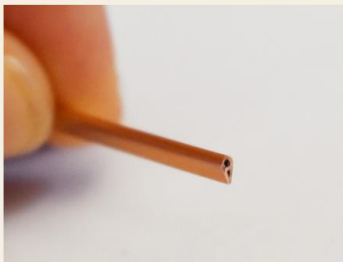


## DIVERSE MULTICHANNEL PROFILES

At MetalKraft Tech our extrusion work involves a diverse array of profile types.



Seven Channels



Two Channels



Two Channels



Ten Channels

Manufacturing & assembly tooling/jigs

Performance predictions

Instrumentation

SPC workshop input