



**THEVA**

# **HTS-WIRE FOR HIGH FIELD MAGNET APPLICATIONS**

## **STATUS QUO – FuSuMaTECH MEETING**

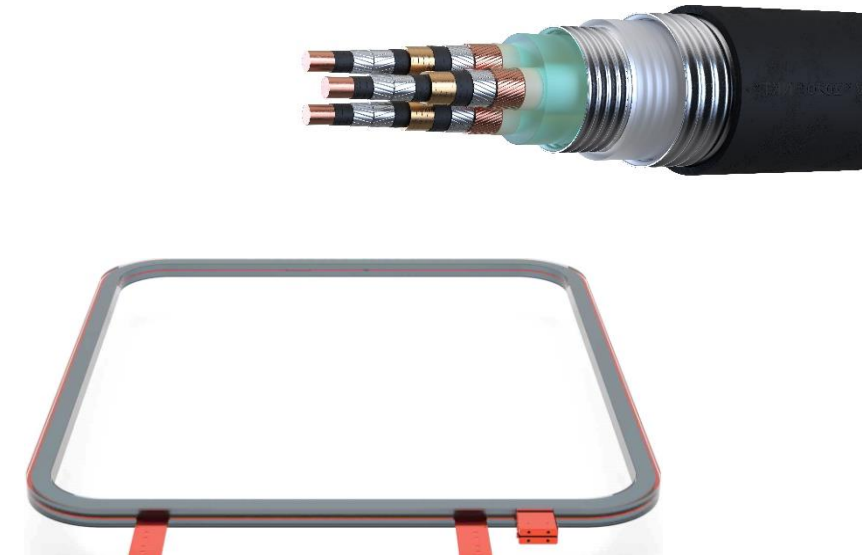
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## CURRENT STATUS I – DEVELOPMENT PROJECTS

- **SuperLink:** Superconducting Cable for the city grid of Munich (*BMW*)  
→ HTS tape design and production for cable purposes
- **RoWaMag:** HTS Magnet System for Aluminum Billet Heater (*BMW*)  
→ FEM design and manufacturing of HTS magnet system
- **MEEST:** Enhanced Entry system for space transportation (*H-2020*)  
→ HTS tape design for magnet system
- **SuperEMFL:** Superconducting magnets for the European Magnet Field Laboratory (*H-2020*)  
→ production of necessary type and amount of HTS tape
- **AppLHy!:** Hybrid pipeline for liquid hydrogen and electrical energy (*BmBF*)  
→ development of hermetically sealed HTS tape
- **Filaments4Fusion:** 3D filamentized metal substrate for fusion energy application (*Eurostars*)  
→ development and production of superconductors in widths  $< 0.5$  mm



# CURRENT STATUS II – PRODUCTION OPTIMIZATION

## High performance wire

Enhanced HTS thickness (4.5  $\mu\text{m}$ )

$I_{C,min}$  (77K, s.f.) = 750 A – 1000 A

Piece length: 50 m – 200 m

## Laser Slitting

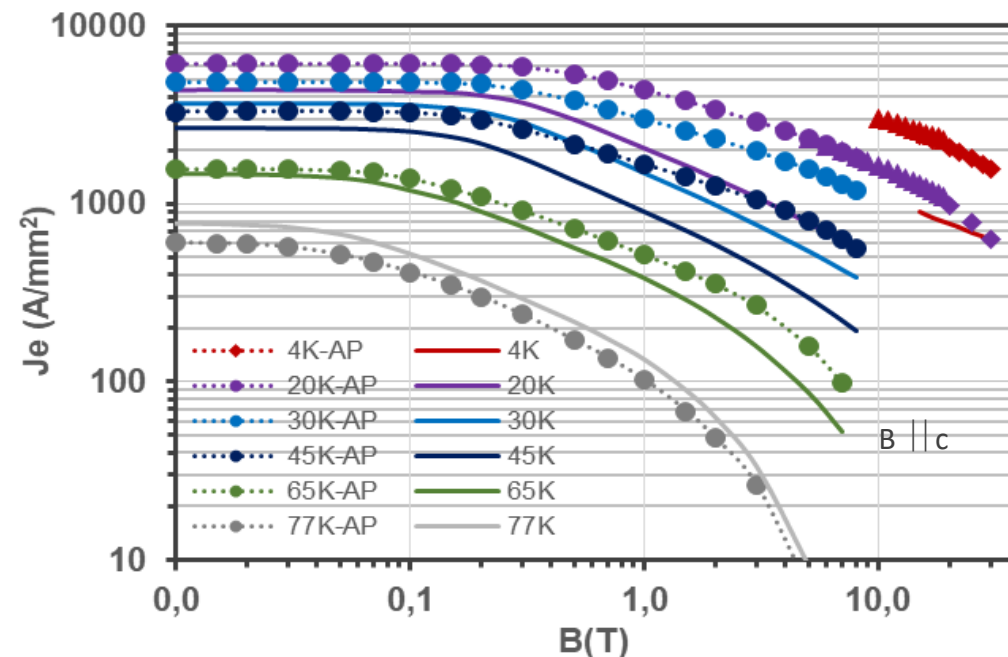
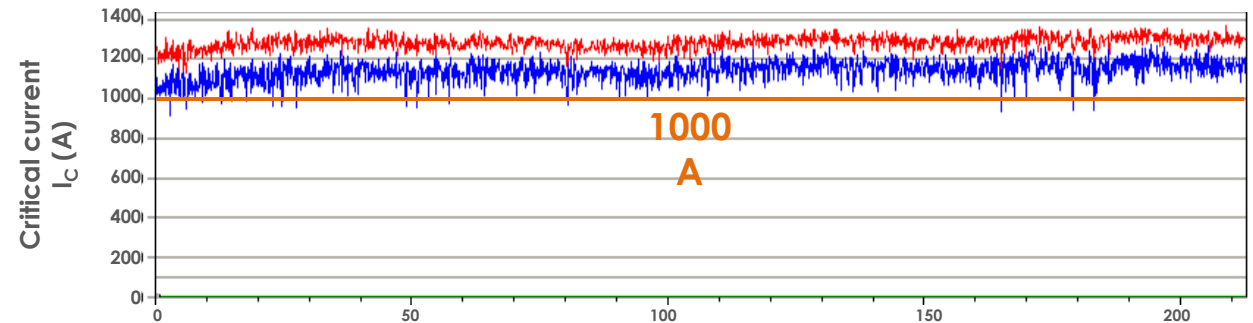
Clean, straight edge – no burr

## Introduction of Artificial Pinning

Current density for  $B \parallel c$  of total 60  $\mu\text{m}$  thick tape  
(40  $\mu\text{m}$  substrate and 5  $\mu\text{m}$  surround Cu coating)

- 10 T: 3000 A/mm<sup>2</sup>
- 20 T: 2000 A/mm<sup>2</sup>                      @ 4.2 K
- 30 T: 1550 A/mm<sup>2</sup>

**@ 20 K, 20 T: 800 - 900 A/mm<sup>2</sup>**



Below 50 K:  $I_C(B)$  improvement by factor 2.5

Thank you!

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