



BSBF2022 - SME Track



Mark & Wedell A/S

Your trusted engineering partner



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Company presentation
BSBF 2022 – SME Track

Agenda



1. Mark & Wedell and our Big Science products
2. Reference list and specific project
3. Challenge with Big Science



Mark & Wedell A/S – Who We Are

- Founded in 1974
- Complete in-house development, mechanical & electrical engineering, project management and 4,000 m² of manufacturing facilities
- Machine, Welding, Metal and Electrical workshops and testing facilities
- 35+ employees
- *ISO 9001:2015 certified*
- ATEX Certified Equipment Supplier



M&W Business Units



M&W – Big Science

Optimised Superconducting Current Leads



5-20% of sales

M&W JAWO Sampling

- Sampling solutions for production and process industry
- Established in 1984
- 1500+ products delivered
- 300+ sampling solutions installed in 75 countries



40-65% of sales

M&W Engineering


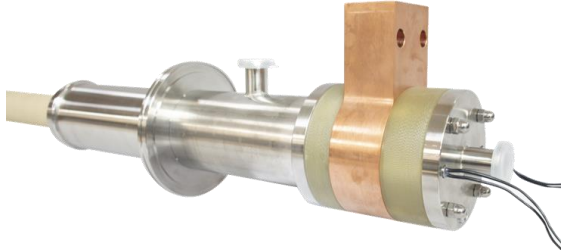


- Subcontracting and prototype work
- Established in 1974
- 30+ industrial customers - half of which with more than 20 years of business relationship



30-40% of sales

Current Leads Product Overview



			
<p>Conduction (CdH)</p> <p>Current:</p> <ul style="list-style-type: none"> • 10-100 A <p>Coolant:</p> <ul style="list-style-type: none"> • LHe <p>Operation:</p> <ul style="list-style-type: none"> • 24/7 (LHC) 	<p>Convection (CvH)</p> <ul style="list-style-type: none"> • 100-30.000 A • LHe + GHe • 2-4 weeks/test 	<p>Convection w. HTS (CvHH)</p> <ul style="list-style-type: none"> • 2.000 -70.000 A • LHe + GHe • 24/7 	<p>Hybrid / Retrofit (CvHH/CvHNNH)</p> <ul style="list-style-type: none"> • 2.000-30.000 A • LHe + GHe + LN2 • 3-6 weeks/test

What does the Current Leads Do?



It “Bridges” the Warm and the Cold terminals.

- **Current leads** are a key component in any superconductor technology.
- It leads the current from the ambient temperature of 20°C to the cold environment where the superconducting wires are operated.
- The superconductor must be cooled to cryogenic temperatures, which for low temperature superconductors is around 4 K (-269°C).

Current:

Coolant:

Operation:

Conduction (CdH)

Convection (CvH)

Convection w. HTS (CvHH)

Hybrid / Retrofit

• 10-100 A

• 100-30,000 A

• 2,000-70,000 A

• 2,000-30,000 A

• LHe

• LHe + GHe

• LHe + GHe

• LHe + GHe + LN2

• 24/7 (LHC)

• 2-4 weeks/test

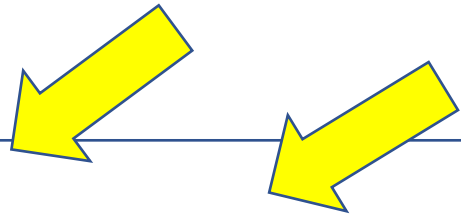
• 24/7

• 3-6 weeks/test

Mark & Wedell – References Big Science



Year	Facility	Experiment	Current	Client	Project	Number of units	M&W Type



Cd = Conduction, Cv = Convection, H = Helium, N :

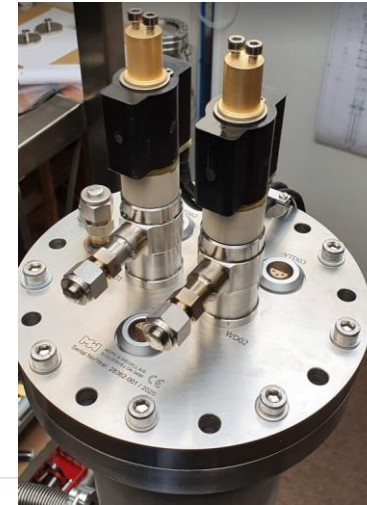


Serving the Big Science market



- Some challenges:
 - The business is often related to “Big project”
 - The tender phase is often very long and required stamina
 - The execution time is often very long and with many stakeholders
 - Often many unknown: design, procurement, production, testing
 - Risk can be difficult to identify, and to mitigate

2019	CEA, Saclay	STAARQ	13 kA	CEA, Saclay	MQ / MQYY magnets for HiLumi.	Upgrade /
2020	GSI	SIS/FAIR	6 kA	GSI	HTS CL for Quadropole (IHEP)	
2021	GSI	SFRS	300 A	Ellyt Energy	Retrofit of Helium Level sensors	
2021	GSI	SFRS	300 A	Ellyt Energy	Current leads pairs	
2021	INFN Catania	Cyclotron	1.500 A	ASG Superconductor	3 pole Current Lead (2 x 1.500 A + 1x 600 A)	



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