

With Our Customer Drive We Establish Trust



Welcome to NIEHOFF

Zeller & Gmelin

February 29th, 2024

Florian Faul

Maschinenfabrik NIEHOFF GmbH & Co. KG, Germany

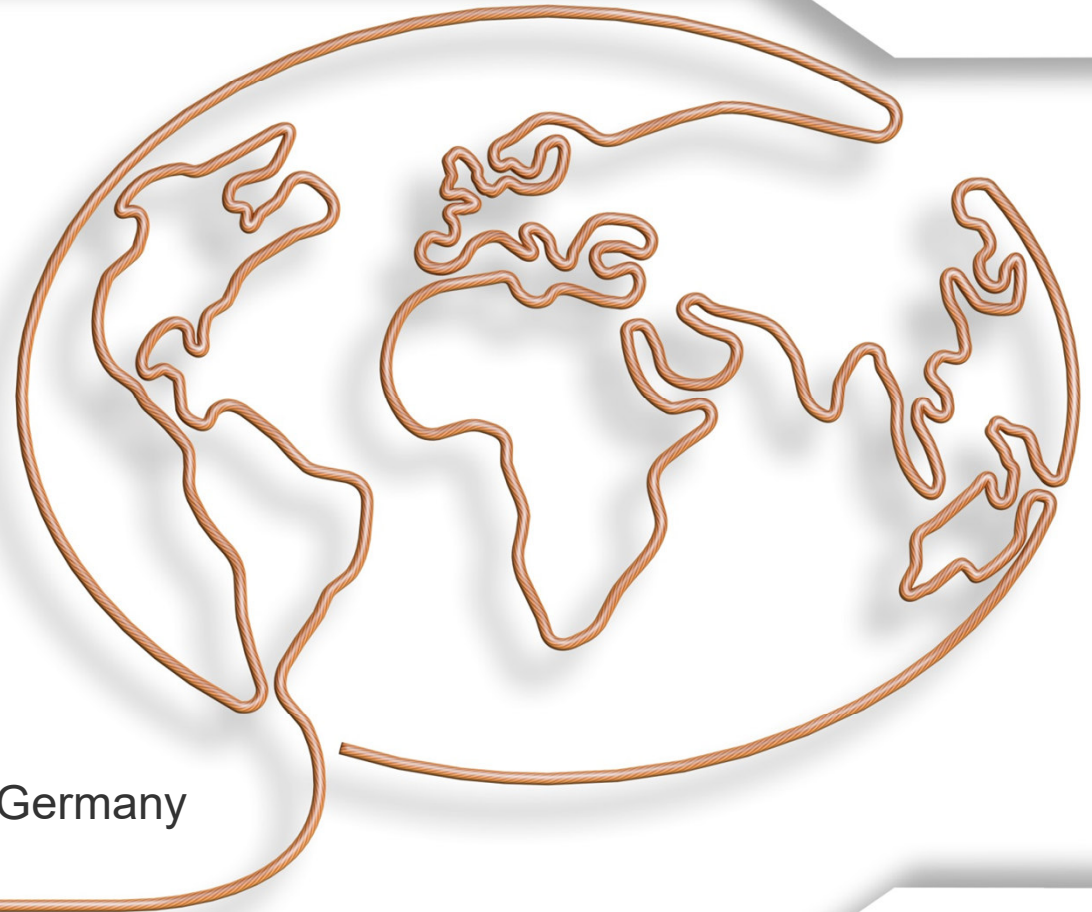


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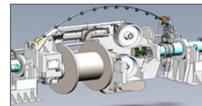
1. Company introduction – our market situation



2. Braiding machines



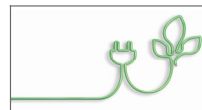
3. Double twist stranding machine D2002



4. MMH lines – latest technology of multiwire drawing



5. Latest development – RBD and annealer „HEAT“



Challenges of Today and Tomorrow ...

Mobility

Urbanization

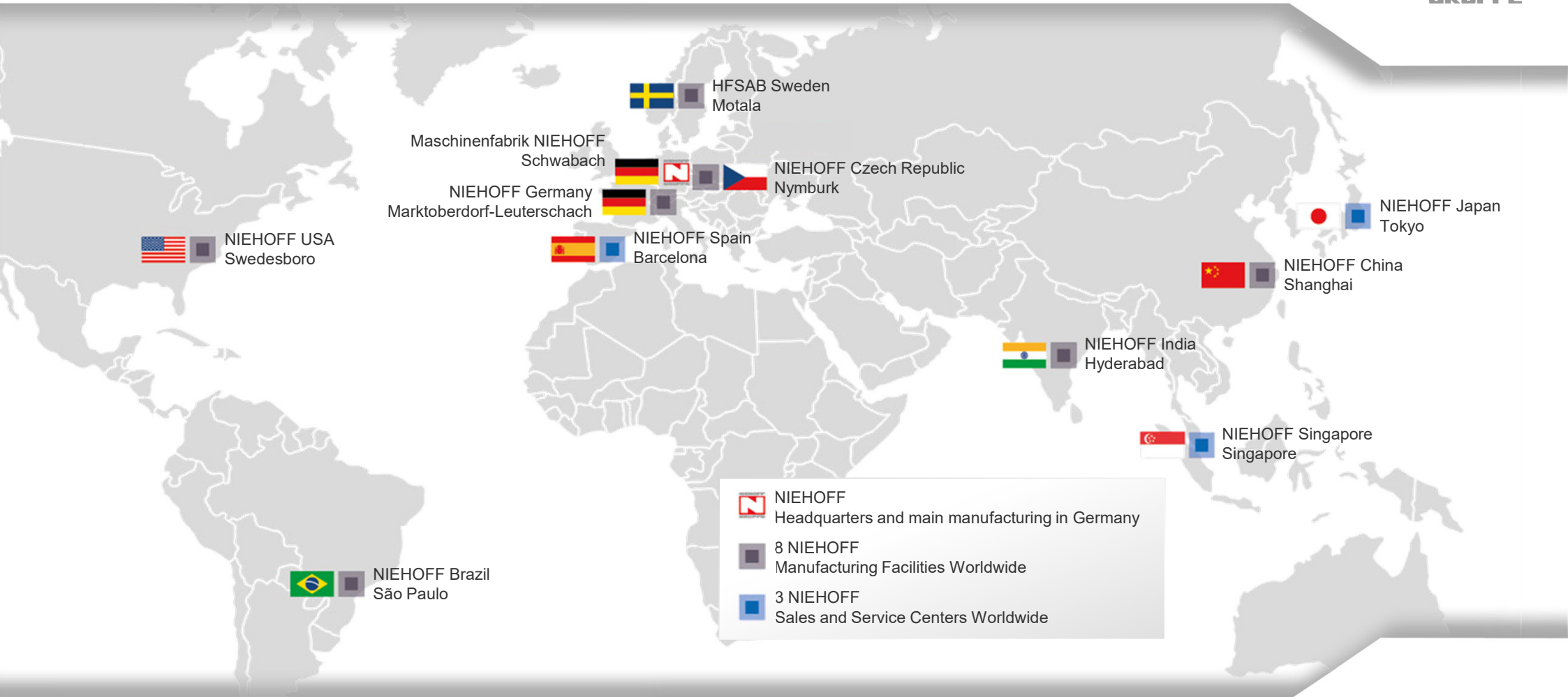
Digitalization

Energy distribution

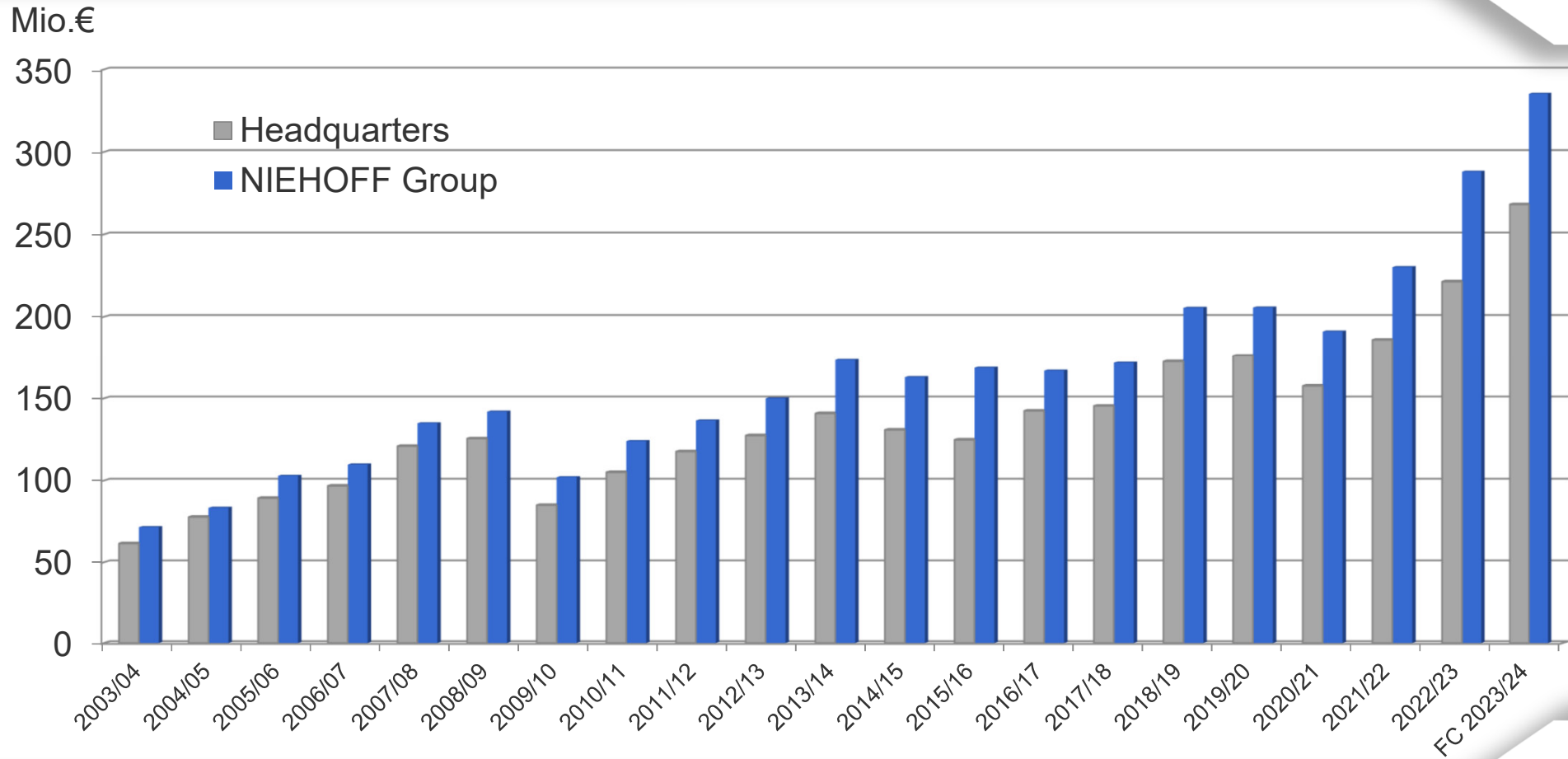
Power generation



Locations Worldwide



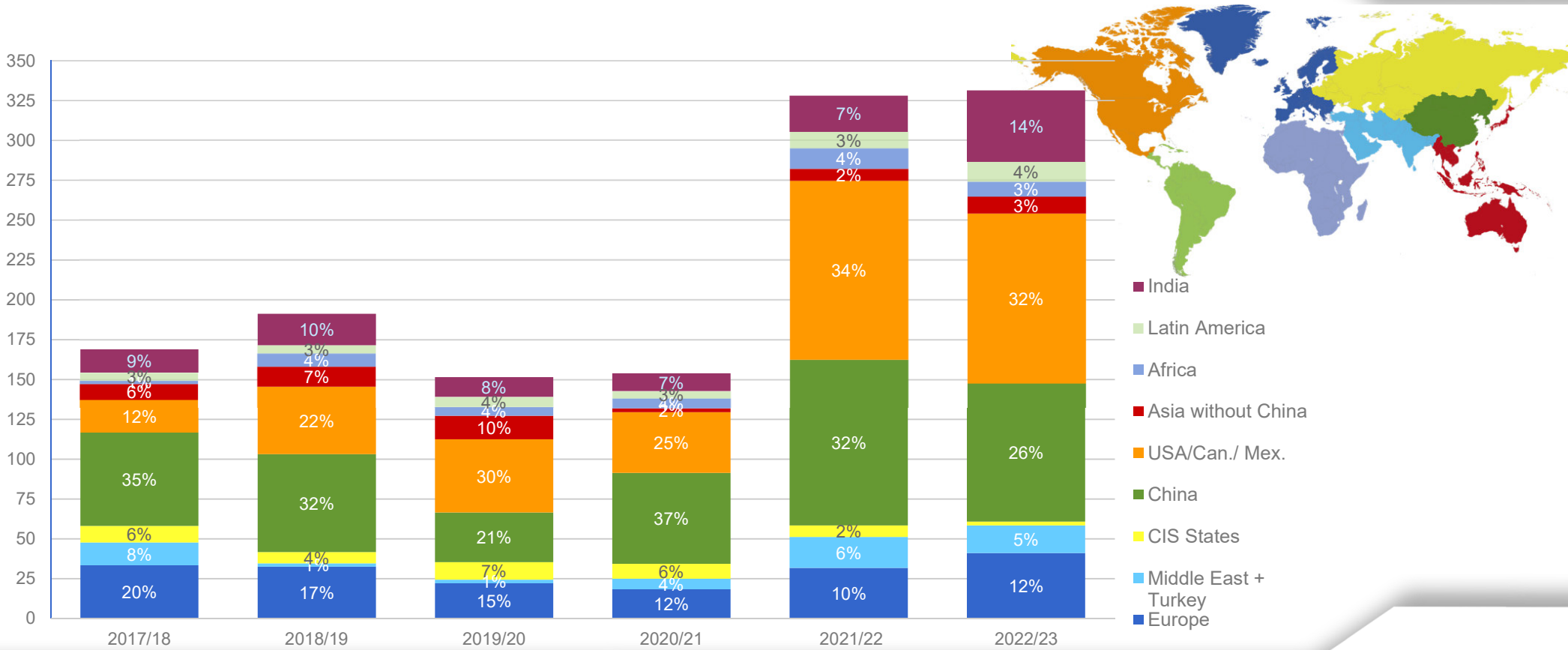
Sales NIEHOFF Headquarters and NIEHOFF Group



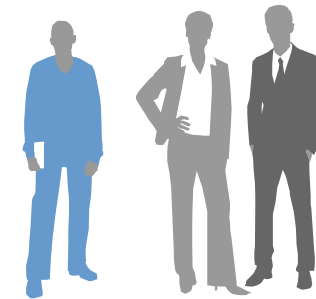
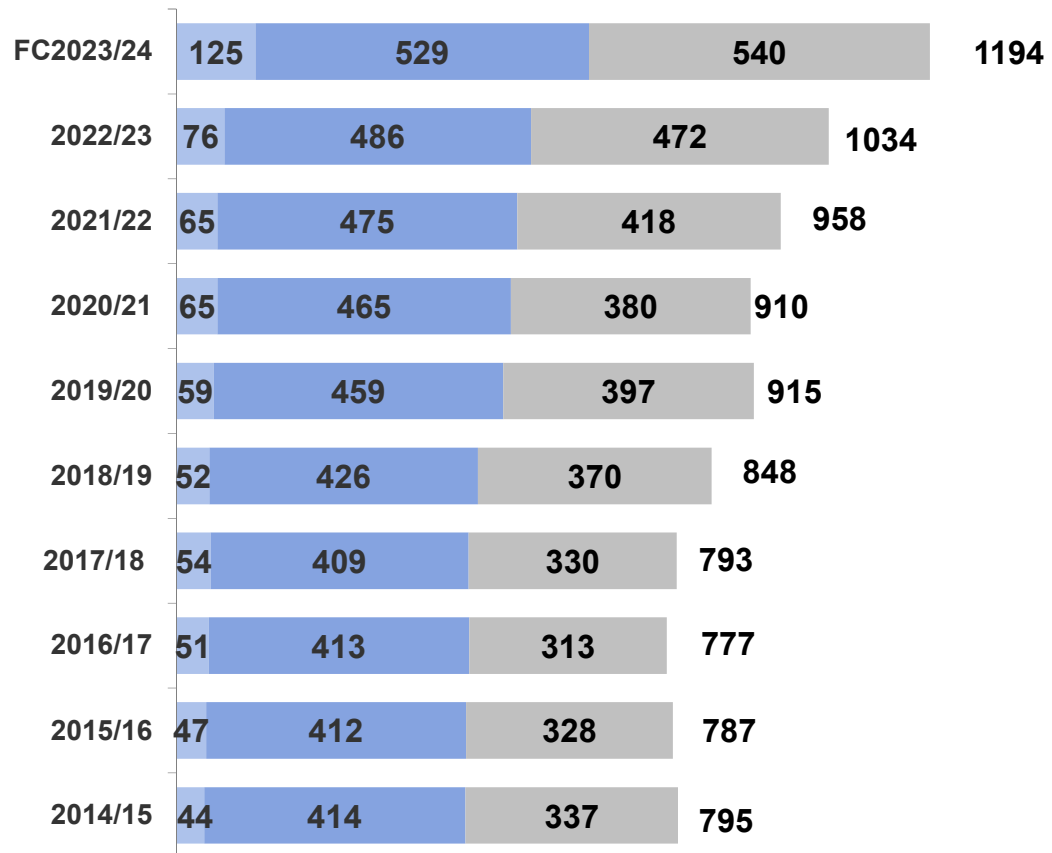
Consolidated Order Income NIEHOFF Group



Mio €



Number of Employees in Germany and Worldwide (FTE)

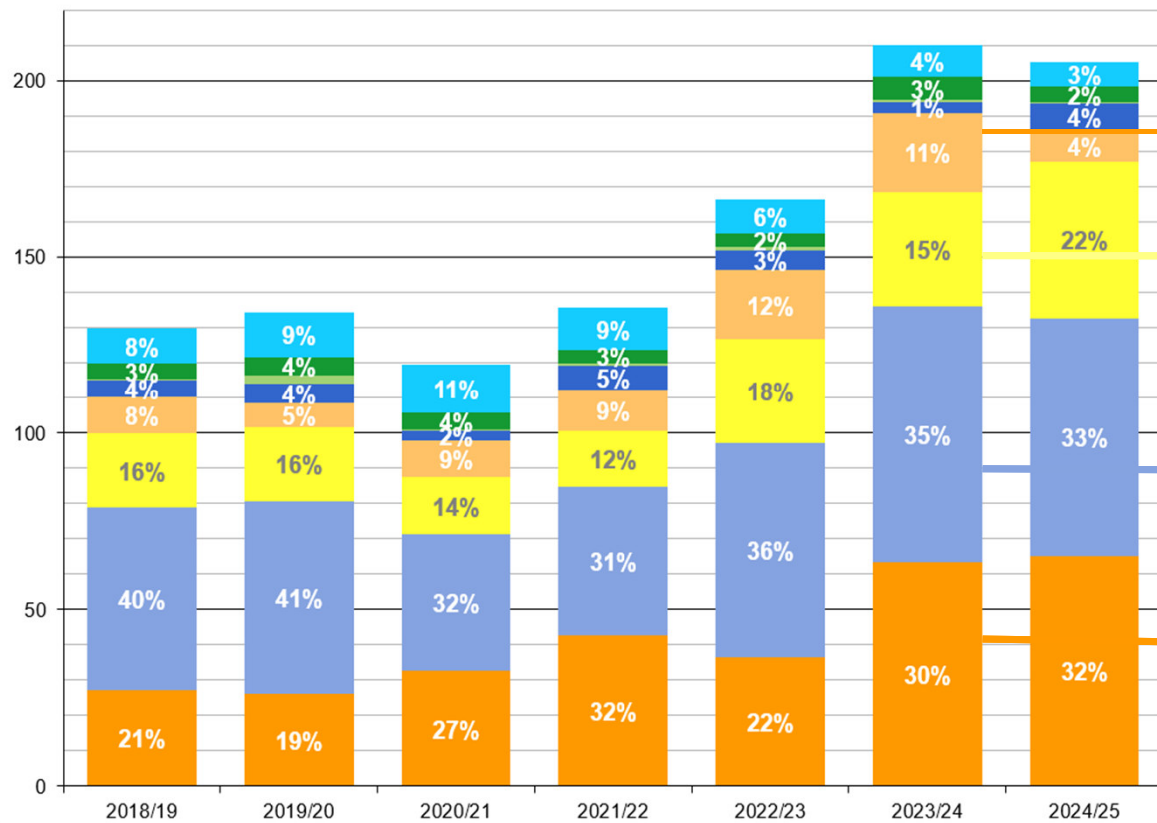


- Trainees
- NIEHOFF Headquarters
- NIEHOFF Group

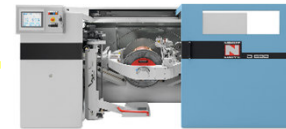
Product Mix per Fiscal Year

Machines Delivered and Order Backlog

Mio. €



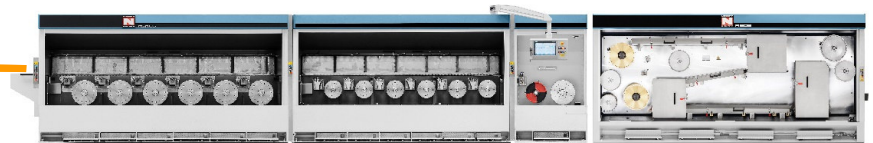
BMV Braiders (304 pcs.)



Bunchers (224 pcs.)



Multiwire Lines (115 pcs.)



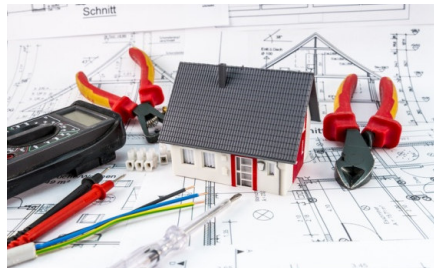
Rod Breakdown Lines (44 pcs.)

- Others (Wire Plating Lines, RI Annealers, Resale Products)
- Other Drawing Machines, Individual Line Elements
- Phone-/Datacable
- NPS (Spooler and Spools)
- Braiding machines and rewriter
- Bunchers and Stranding Lines
- Multiwire Lines
- Rod Breakdown Lines

Market Segments for NIEHOFF Applications



Automotive wires



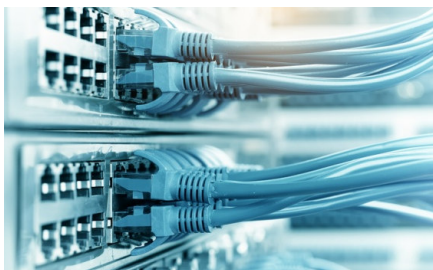
LV building wires



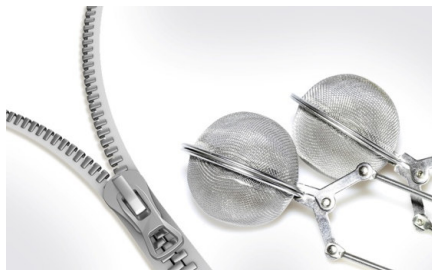
White goods



Energy cables



Telecommunication cables



Mechanical applications



Magnet wires



Bare overhead conductors

2. Braiding machines

NIEHOFF Braiders – Customer Benefits



Fastest machines in the market – up to 200 rpm



3 patented innovations



Empty bobbin detection for efficient quality production



Highest flexibility with up to 3 production steps in Z-machines



Reliable – over 3,500 machines in the market

BMV 16 / 24 / 124



2. Braiding machines

Patented NIEHOFF Braiding Innovations

- a) WTC – Wire Tension Control
- b) ACC – Automatic Coverage Control
- c) Increased Rotational Speed



2. Braiding machines

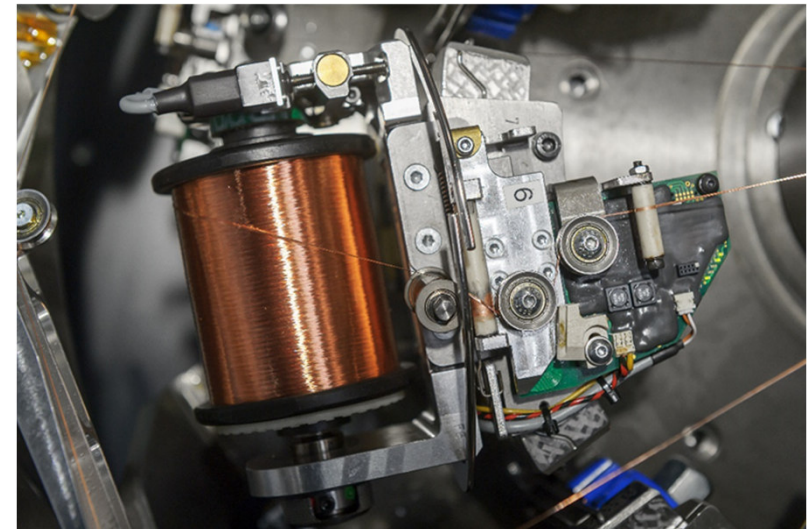
a) WTC – Wire Tension Control

The WTC enables constant wire tension from full to empty bobbin.

As a consequence, the risk of wire breaks is significantly reduced

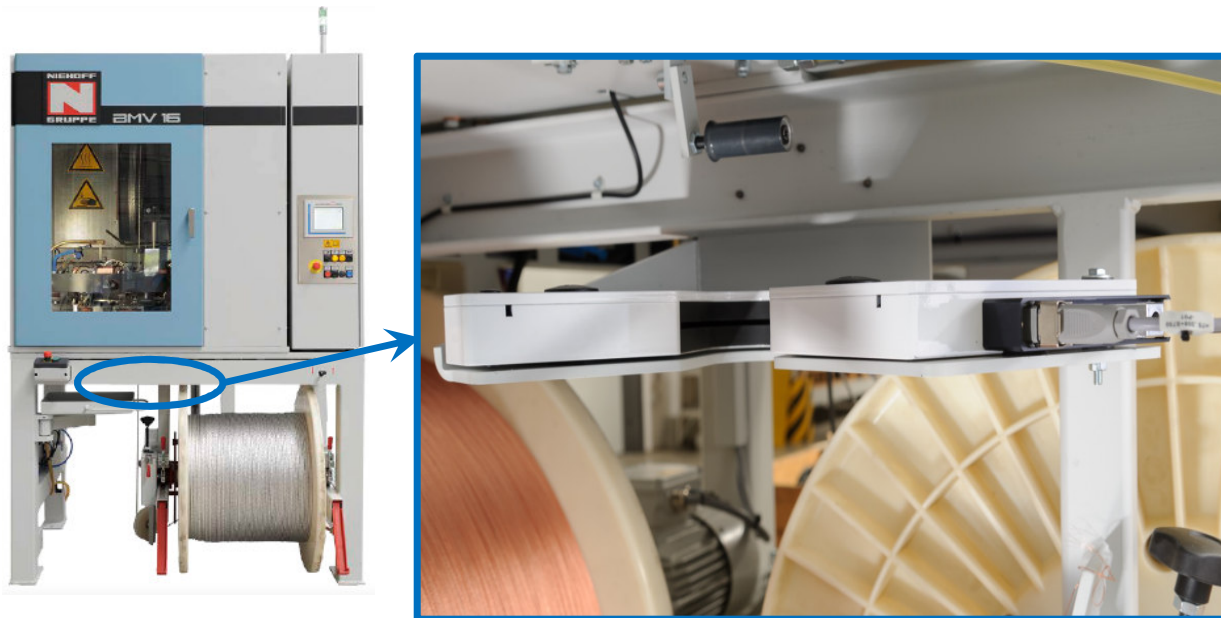
Less downtimes, higher and constant quality of the braid.

Due to traceability, repeatability and automatic setting of parameters, the braiding process becomes more cost efficient.



2. Braiding machines

b) Automatic Coverage Control




- Objective is a constant grade of coverage even if the cable infeed diameter varies
- Rotation speed of the haul-off capstan is adjusted accordingly
- The thicker the diameter of the cable infeed, the more the braiding pitch has to be lowered by reducing the speed

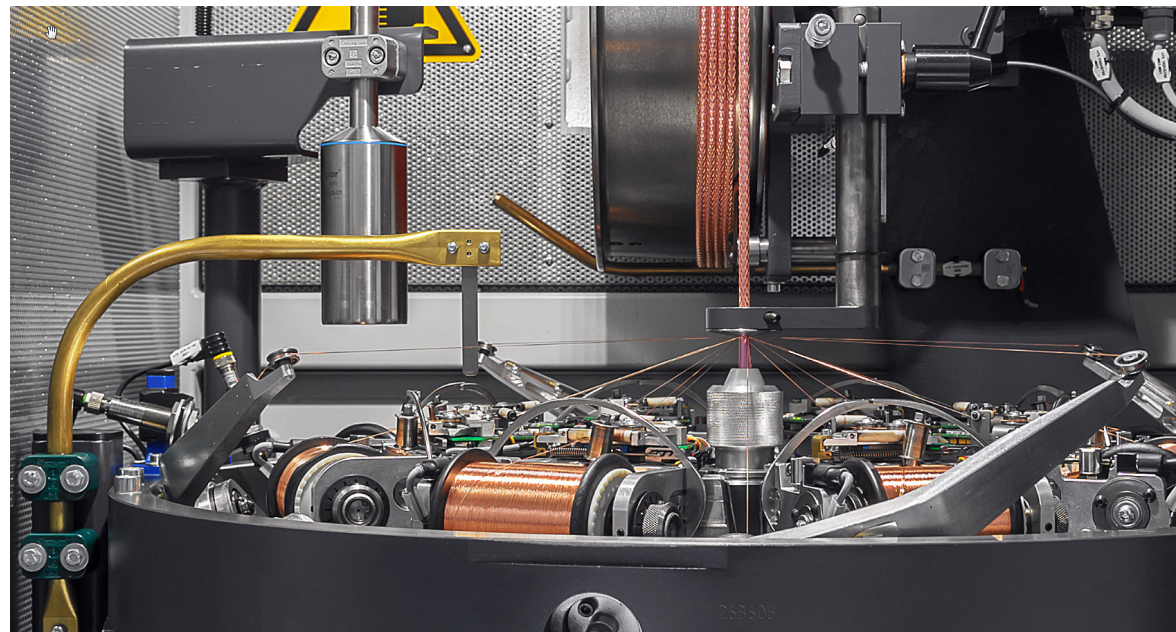
2. Braiding machines

c) Increase Rotational Speed

 Maximum output possible under any operating conditions

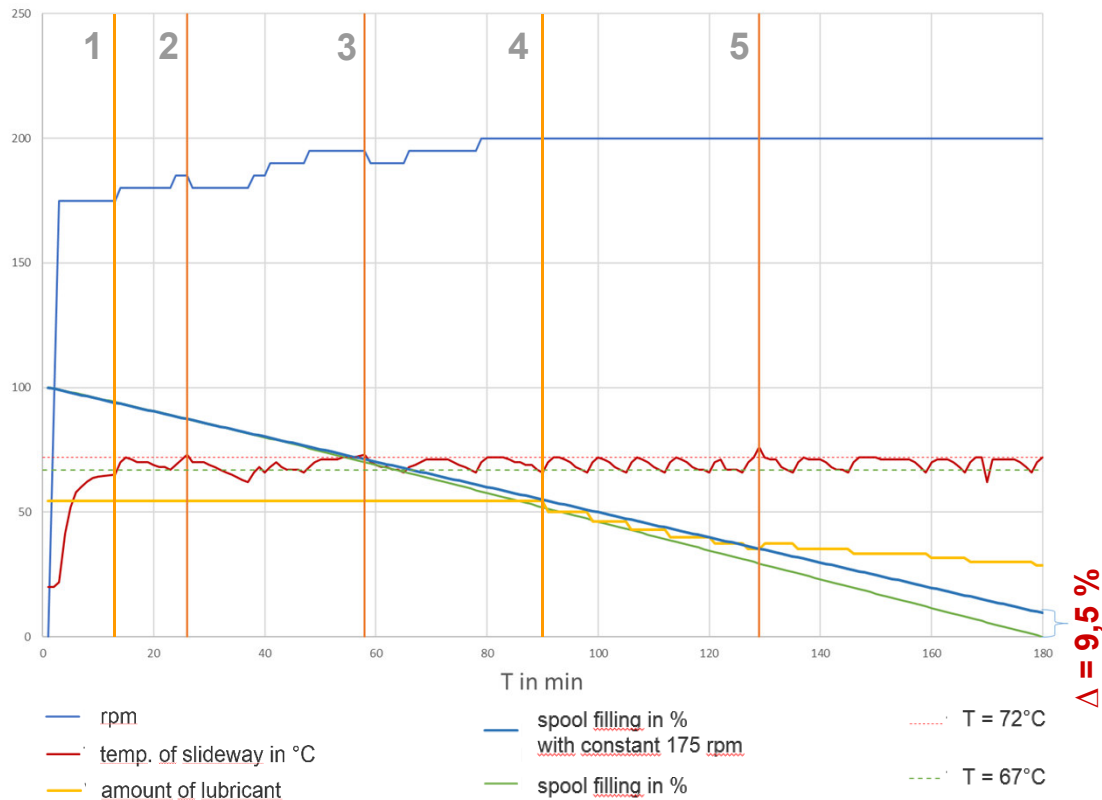
 Cost / time / resource - efficient production

up to 200 rotation per minute!



2. Braiding machines

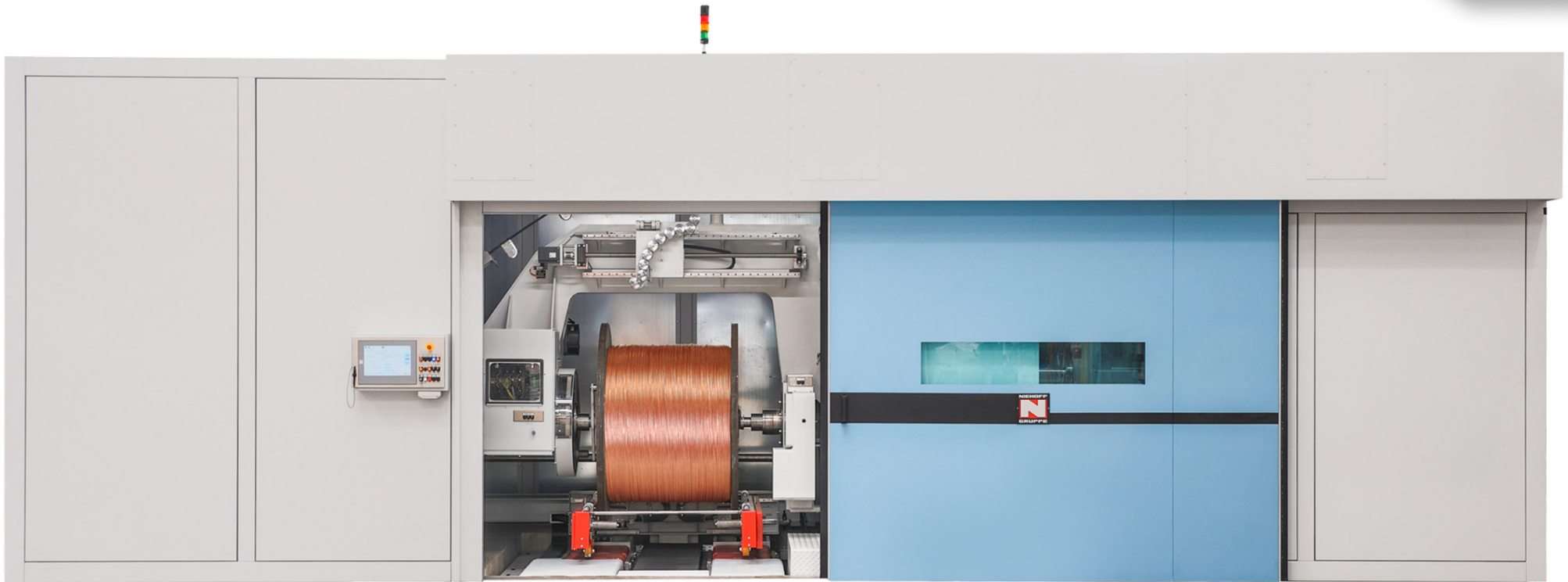
BMV Speed increased to 200 rpm (BMV16)



Smart rpm and lubrication management

- 1 After achieving steady conditions at 175 rpm, rotation climbs up stepwise to keep temp. within upper and lower limit as spool empties
- 2+3 If the temp limit is exceeded too much, rpm also decreases stepwise
- 4 At an rpm level of 200, a decline of temp. leads to reduced lubrication
- 5 If the temp limit is exceeded again, lubrication can be increased temporary

3. Double twist stranding machine D2002



3. Double twist stranding machine D2002

Technical data		D 1252	D 1602	D 2002
max. line speed	m/min	300	200	150
	fpm	984		
max rotating speed	twists/min (tpm)	2000	1200	1000
wire diameter	mm	1.0 – 3.2	1.5 – 4.8	1.5 – 4.8
strand cross-section conductors, Al + Cu, Class 5	mm ²	6 – 120	16 – 240	16 – 400
	AWG - KCMIL	9 – 250	5 – 450	5 – 800
conductors Class 2 Cu	mm ²	6 – 95	16 – 150	16 – 400
	AWG - KCMIL	9 – 2/0	5 – 300	5 – 800
conductors Class 2 Al	mm ²	6 – 120	16 – 150	16 – 500
	AWG - KCMIL	9 – 250	5 – 300	5 – 1000
compacting	Cu	mm ²	70	300
	Al	mm ²	120	400
lay length, steplessly variable	mm	25 – 750	40 – 400	50 – 500
max. cable diameter	mm	25	30	30
max. spool size				
flange diameter	mm	1250	1600	2000
spool width	mm	950	1180	1500
max spool weight	kg	4000	8000	12000

We reserve the right to modify technical specifications according to technical improvement and advances. ND06.2021

3. Double twist stranding machine D2002

Picture / Movie from Testing Area at NCZ



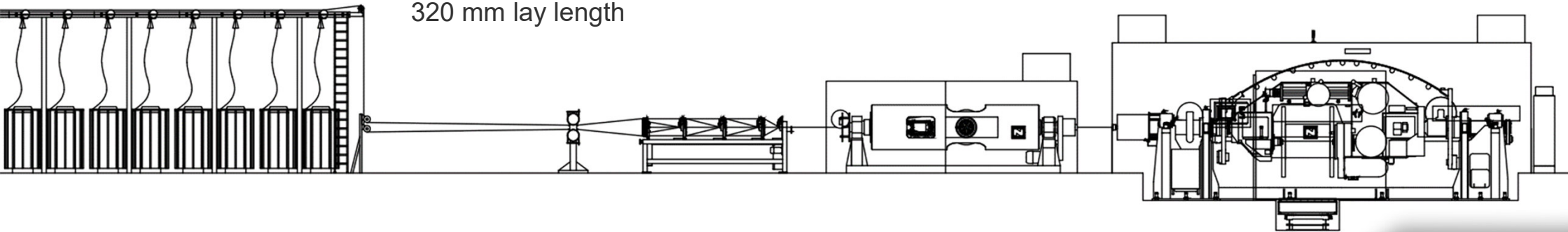
Machine lubrication:

~ 35 kg of grease

3. Double twist stranding machine D2002

Testing area at NCZ:

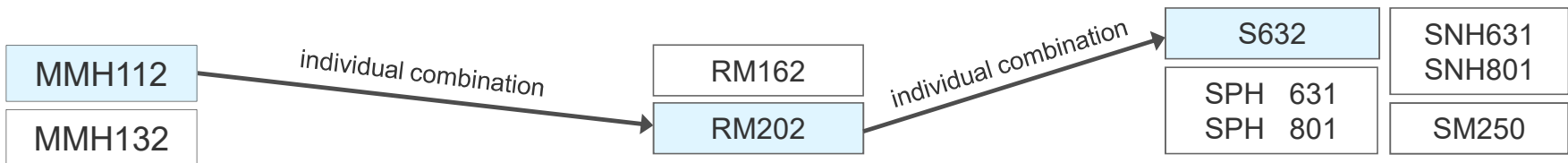
- Worldwide only testing area for such kind of machines
 - Footprint of the entire production line: 54.0 meters in length x 6.5 meters in width
 - The line below will run for demonstration reason during and after the wire show in Düsseldorf 2024
 - Test production: Cu 400 mm² (class 2) compacted (new!)
60 wires x 3,00 mm in diameter
22.8 mm overall product diameter
250 rpm
320 mm lay length
- One spool is filled in 45 min (3.5 km = 11.0 to)



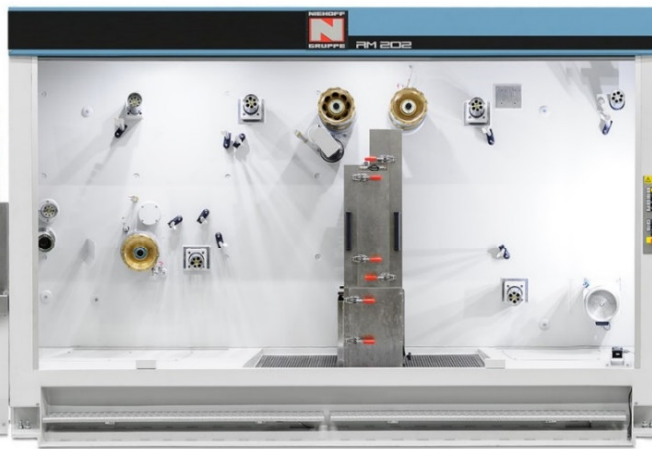
4. MMH lines – latest technology of multiwire drawing



New Generation – NIEHOFF Multiwire Lines



Drawing Machine



Annealer

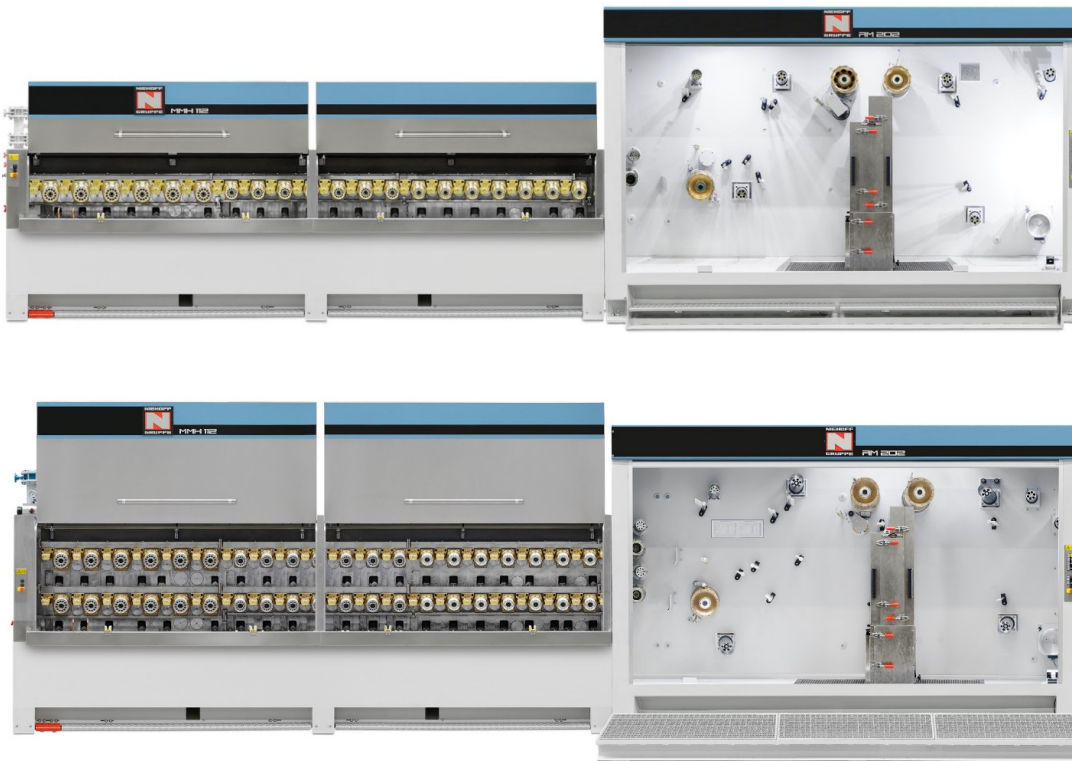


Spooler



4. MMH lines – latest technology of multiwire drawing







Technical Data

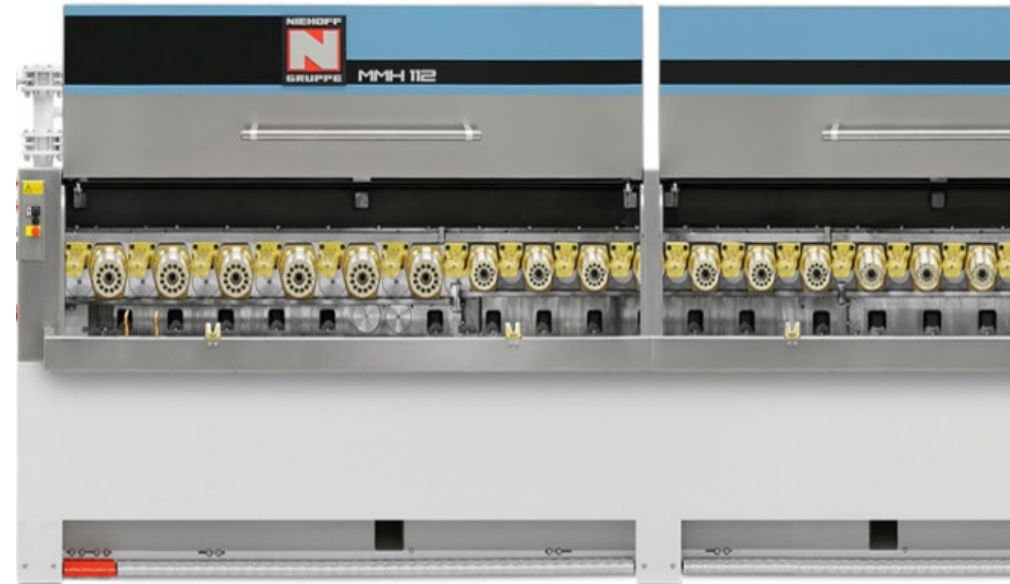


- **Material**
 - Cu and Cu-alloy
 - Al and Al-alloy
- **Max. inlet Ø**
 - 32 x 2.6 mm Cu hard
- **Top speed**
 - 40 m/s
- **Machines sold**
 - Total: 110 pcs.

4. MMH lines – latest technology of multiwire drawing

Benefits

-  Productivity increase by easy access and high speed production
-  Excellent energy cost savings by block drive technology
-  Low noise emission by minimum slip and water cooled motors
-  Maximum flexibility – fast and easy product change
-  Fast and easy machine installation
-  Perfect wire quality

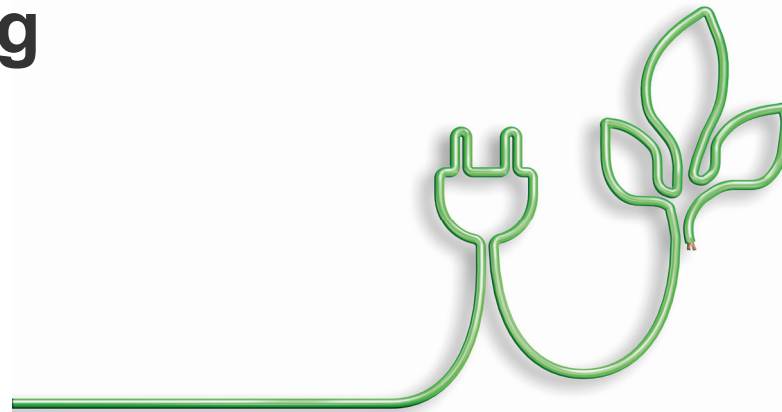


**New Generation of NIEHOFF Rod Breakdown Lines
With High Efficiency Annealing Technology = HEAT**



Less Energy – Less CO2 – Higher Output

**New Generation of NIEHOFF Rod Breakdown Lines for
Sustainable Manufacturing**



**New Generation of NIEHOFF Rod Breakdown Lines
With High Efficiency Annealing Technology = HEAT**



NIEHOFF Rod Breakdown Drawing Line MSM88 and R502H for Copper



New Generation of NIEHOFF Rod Breakdown Lines With High Efficiency Annealing Technology = HEAT

Total Annual Savings – MSM 88 + R502.H

Total Annual Energy Savings = 462,000 €/a

- 2,100,000 kWh savings / year equal to 840 t of CO2 savings / year
- With 2,100,000 kWh you can supply 100 households with energy for one year
- 220 flights from Frankfurt to New York City and back (12,400 km)

Subsidies in Germany and Europe:

30 - 55 % cash grant / repayment subsidy for machinery / equipment for energy and resource efficiency.

up to 30 % cash grant for investments in machinery / equipment from the Environmental Improvement Plan (EIP).



5. Latest development – RBD and annealer „HEAT“

Benefits



Maximum productivity



Excellent energy savings



Low noise emission



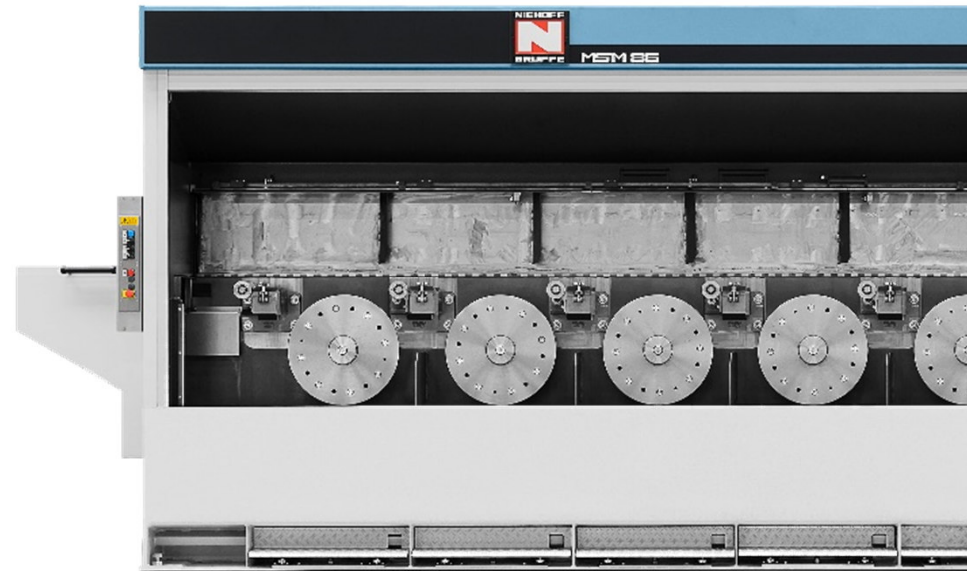
Minimum maintenance costs



Excellent flexibility



Perfect wire quality



Torque Motors – Functional Principle

- A torque motor is a specialized form of a permanent magnet synchronous AC motor which can operate indefinitely without damage while stalled.
- Torque motors are normally designed in a toroidal form.
- They mainly differ from similar motors in their wide diameter allowing for high torque levels, and their thermal performance which facilitates continuous operation while drawing high currents in a stalled state.



5. Inline annealing system R502 and R502 H

R 502 – Basic Design



- Big pulleys along the wire path
- Horizontal design
- Avoiding eddy current
- Clean and ergonomic process area
- Annealing of wire also during line stops
- Excellent and efficient wire cooling and drying

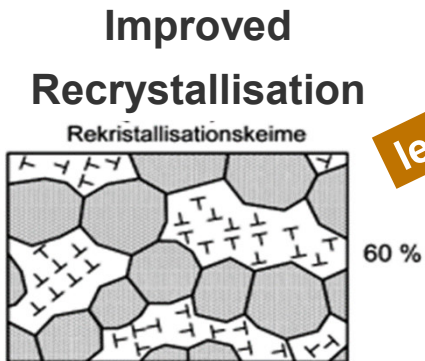


Fantastic Energy efficiency



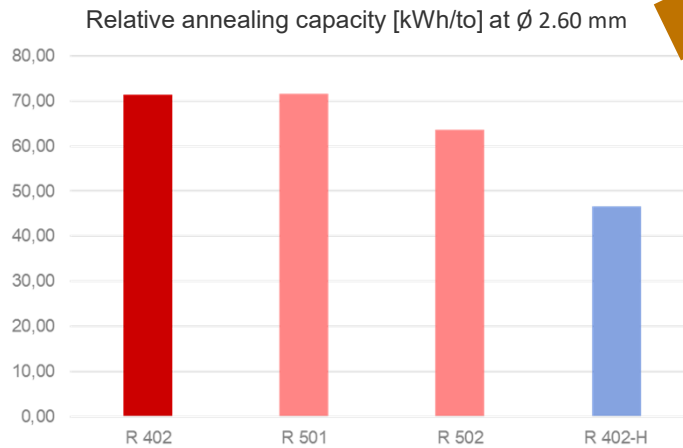
High productivity

Annealing – R502.H



leading to

Better energy efficiency



allows for

Higher output

R502 **R502.H**

+ 33% (max)

2x 2,6 24,0	2x 2,6 32,0	Diameter (mm)
		v max (m/s)
530	530	P (kW)
7400	7356	I (A)
41,2	41,6	U (V)
8347,5	11130,0	Production output [kg/h]



Expertise, Customer Driven, Service – in Good Hands with NIEHOFF



Thank you!

