Wölfer technology is moving your business

Wölfer Motoren

1 **Who Are We?**

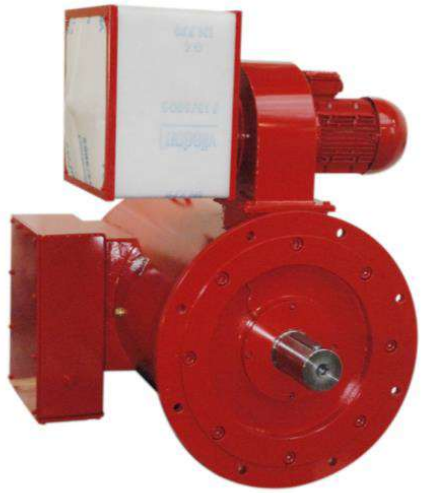
3 **References!**

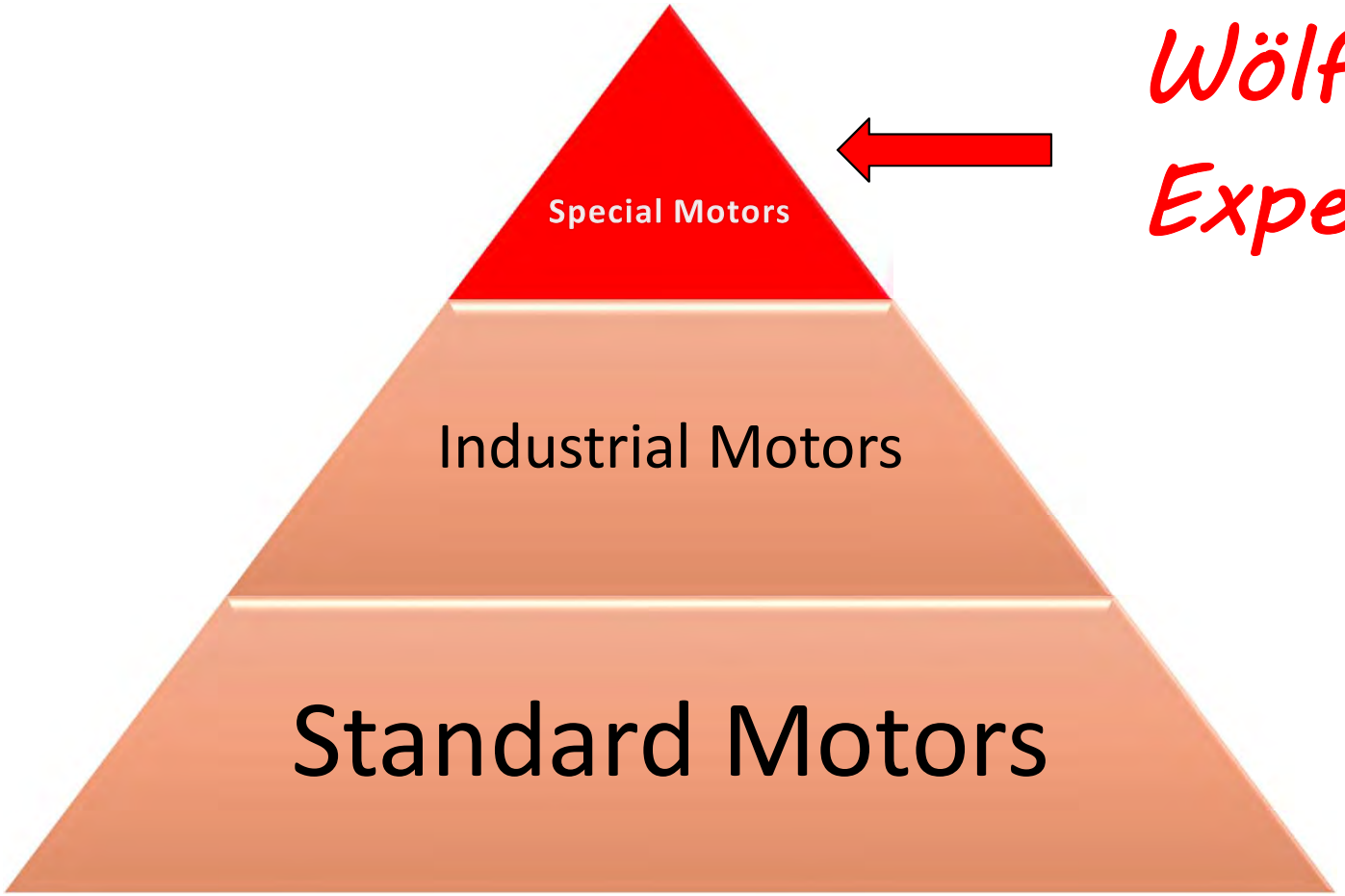
2 **Effizient Cranes by Customized Motors!**

- **Applications**
- **Products**
- **Efficiency**

1 Who Are We?

- **1945**: Founded by engineer Franz Wölfer
- **1955**: First Slipring Motors for lifting applications
- **1960**: First Squirrel-cage Motors
- **1985**: First Squirrel-cage Motors for inverter operation
- **2008**: New test field up to 2.100 kW
- **2016**: First water cooled Motors
- **2019:** Wölfer becomes part of Menzel Berlin

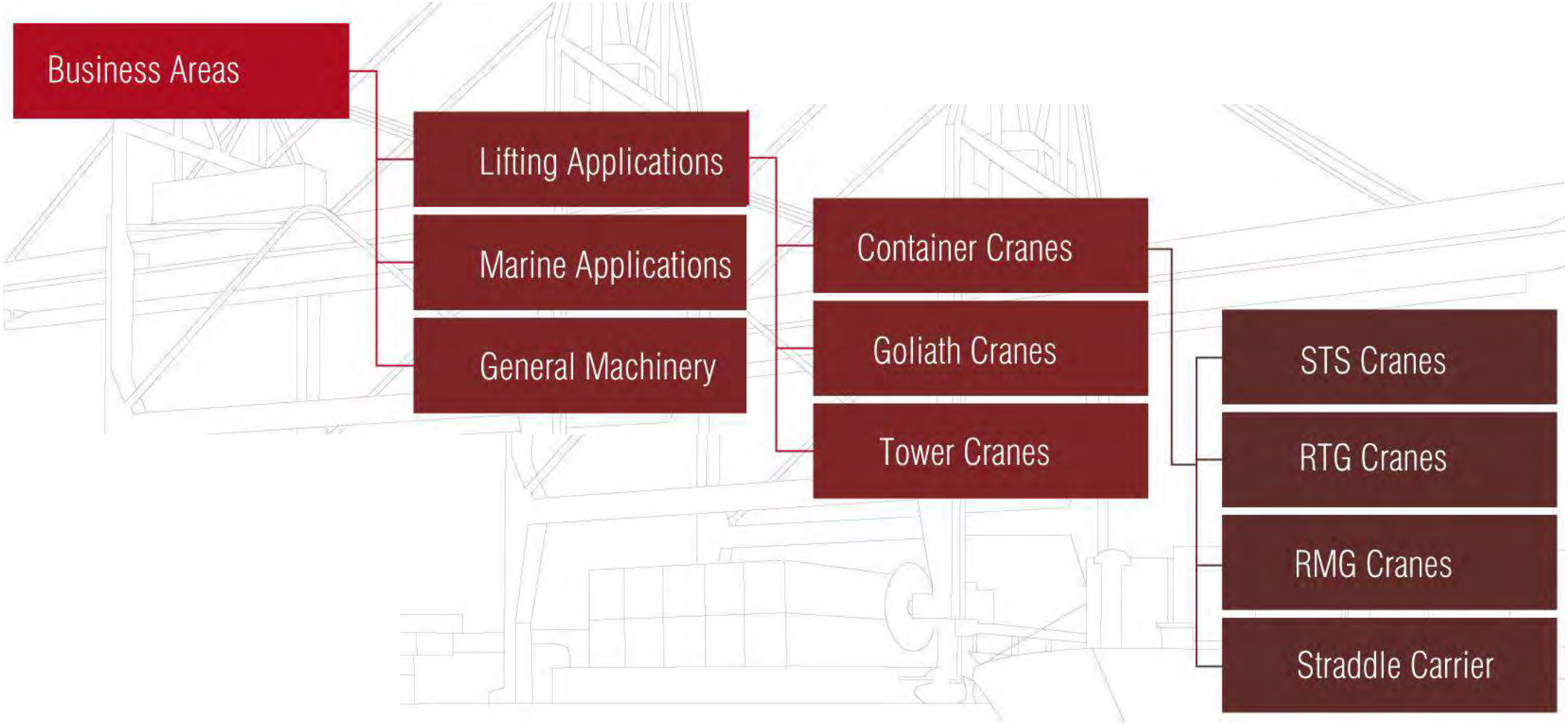




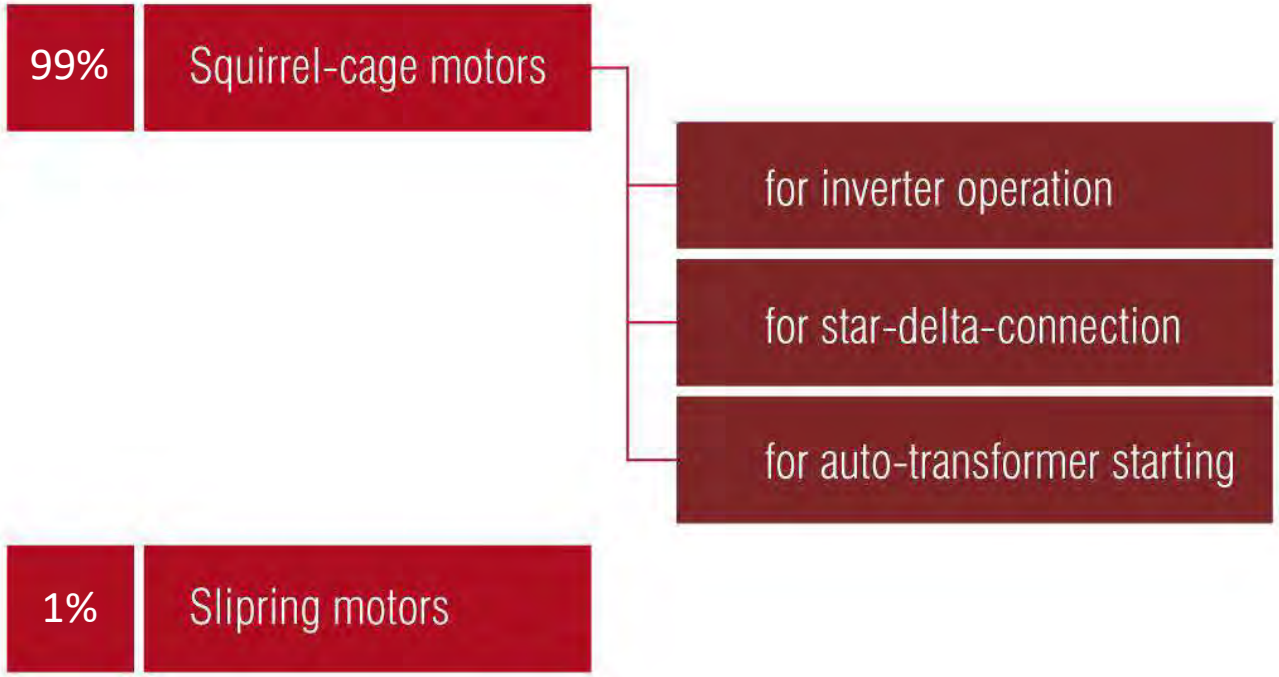
Wölfer´s Expertise!

2 | Efficient Cranes by Customiuzed Motors

Lifting Applications are our core business - since more than 70 years!

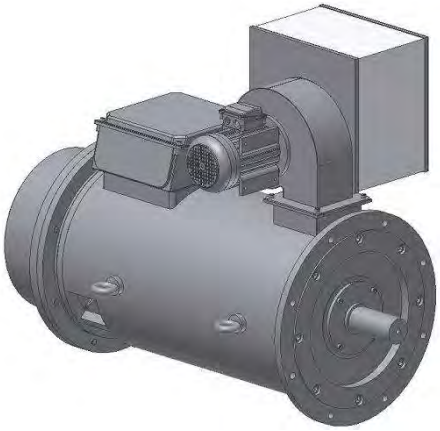


Construction Types!

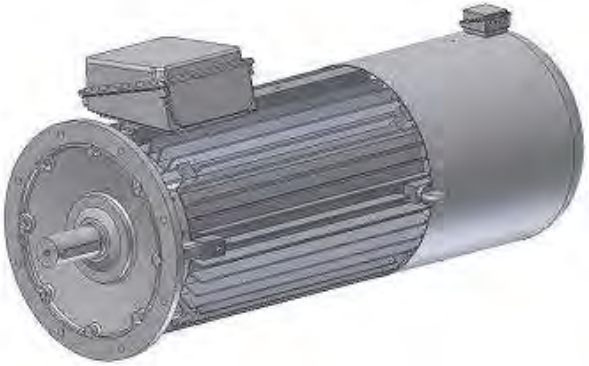


Construction Types – IEC Classification and Frame Size Covered!

IP 23
Inner Cooled
Steel Welded Housing



IP 66
Outer Cooled
Grey Cast Iron Housing



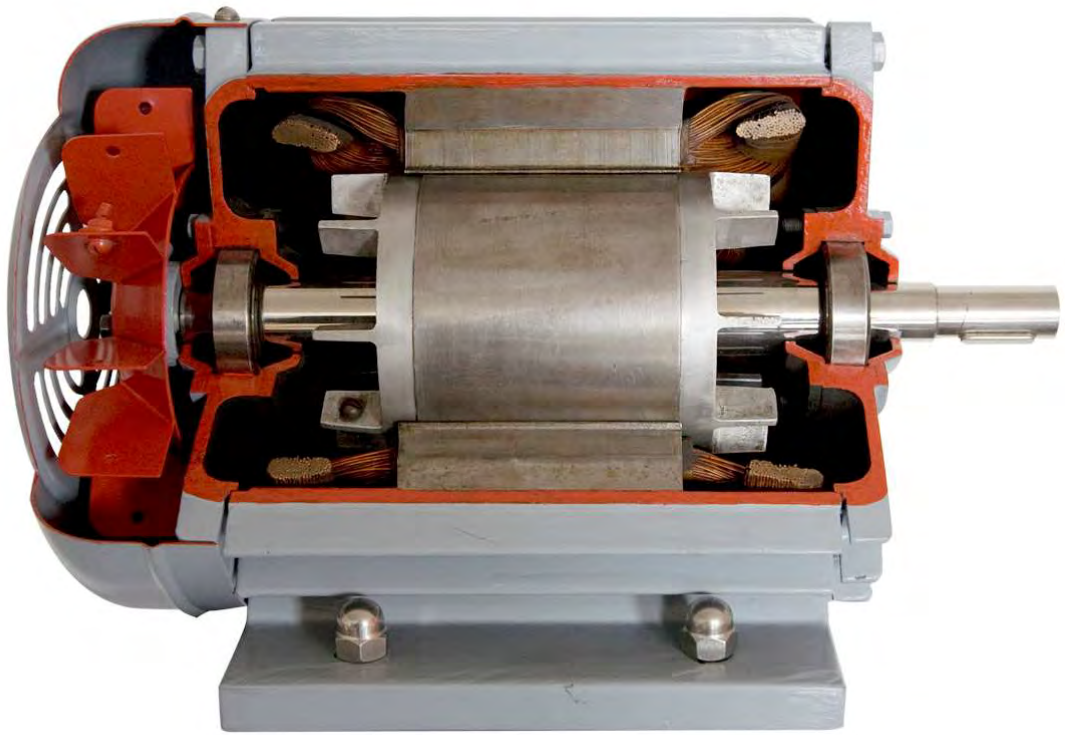
IP 66
Water Cooled
Steel welded Housing

Construction Types – Cooling Prinziples!

- Self ventilation (IC411 and IC01)
- Forced ventilation (IC416 and IC06)
- Without ventilation (IC410)
- Air-air-cooler (IC616)
- Air-water-heat-exchanger (IC86W)
- Water cooled

Construction Types – Technical Design Specs…

- Rated voltage up to 690 Volt
- Rated speed limited by mechanical carrying capacitiy,
  not by electrical parameter
- Insulation class F or H
- Available numbers of poles:
  2, 4, 6, 8, 10, 12 …..
- Duty cycles according to FEM
- Types of mounting according to IEC

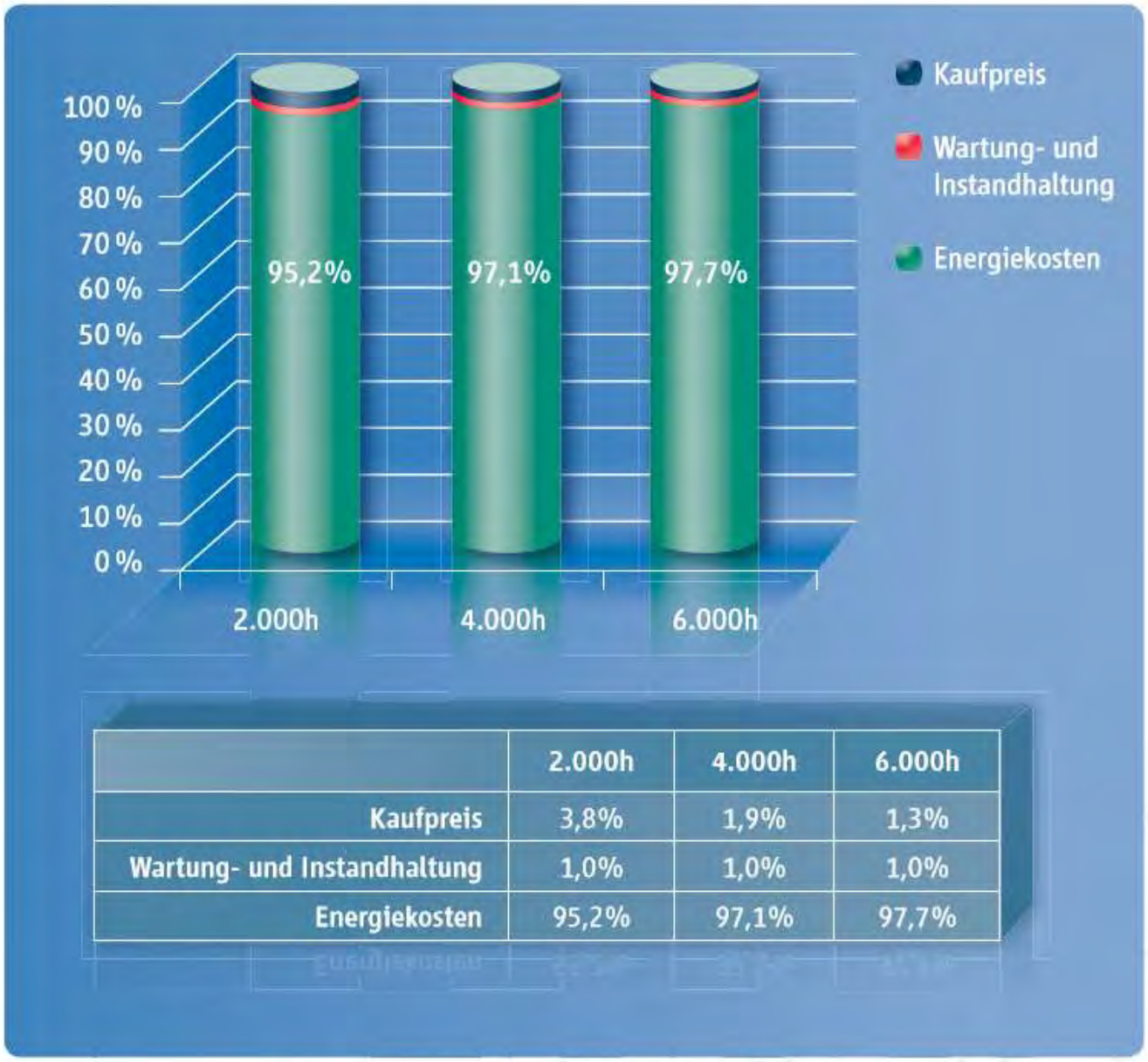


Important Constructive Elements – Windings, most special from Wölfer!

- Special insulation system for inverter operation
- Special wires developed for frequency converter operation
- Resistance against partial discharges

Important Constructive Elements – Rotors, most special from Wölfer!

- Lowest moments of inertia
- High pull-out torques
- Excellent control qualities, in whole range of speed
- Shorter acceleration times
- Low current consumption



	2.000h	4.000h	6.000h
Kaufpreis	3,8%	1,9%	1,3%
Wartung- und Instandhaltung	1,0%	1,0%	1,0%
Energiekosten	95,2%	97,1%	97,7%

Accoding ZVEI :

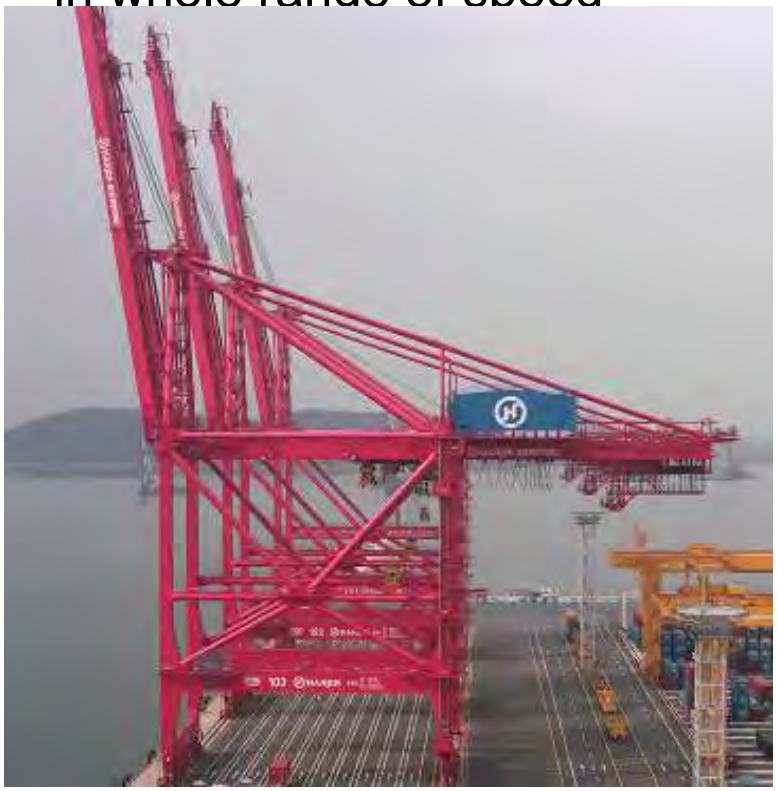
Investment app. 2%

Maintenance app. 1%

Ernergy cost app. 97 %

2 Efficiency

- Lower moment of inertia
- Shorter acceleration time
- Excellent control characteristics, in whole range of speed



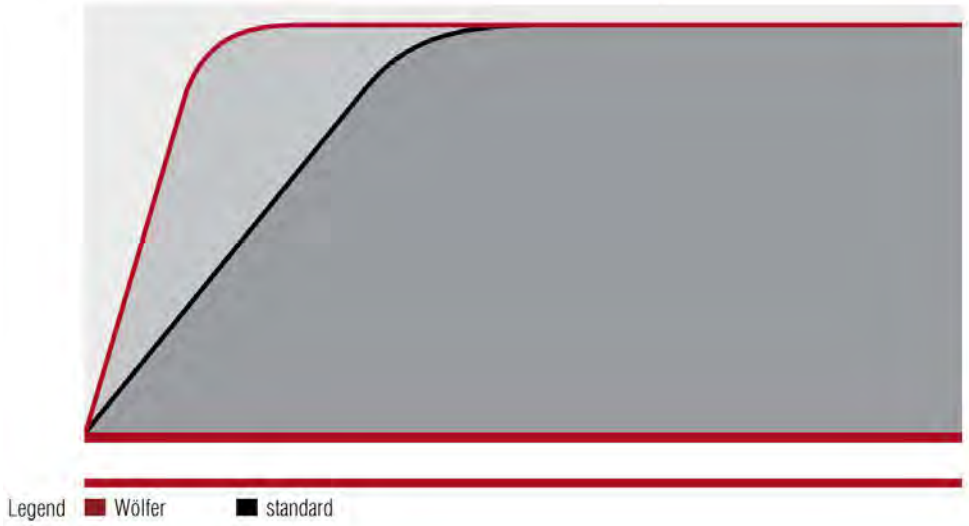
- Lower starting and operating currents
- Due to lower currents posibility to use:
  - smaller cables
  - smaller inverters
- Energy savings up to 8%
- more moves of containers per hour!

Important Constructive Elements – wide variety of Additional Equipment!

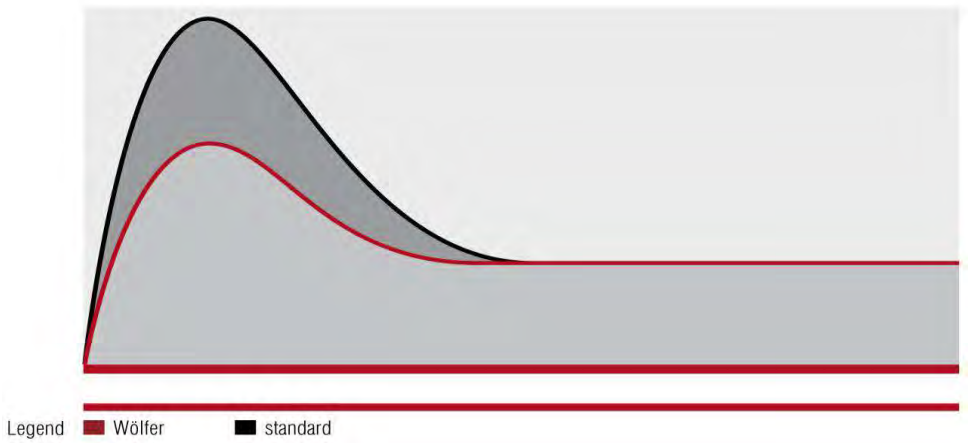
- Brake
- Encoder (specified by customer)
- Forced ventilation
- Two shaft ends
- Anti-condensation heater
- All kind of winding protection
- Bearing monitoring
- Vibration monitoring
- Insulated bearings,
  standard ≥ frame size 315
- Special grounding system

2 Efficiency

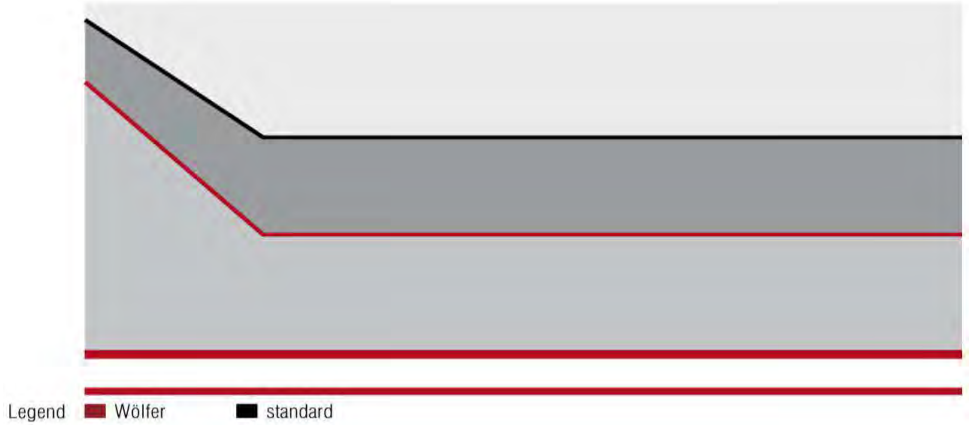
Acceleration time



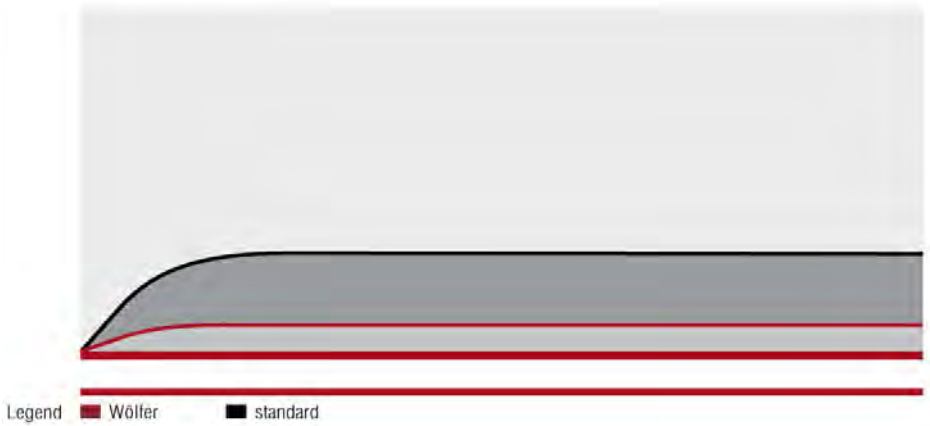
Starting current



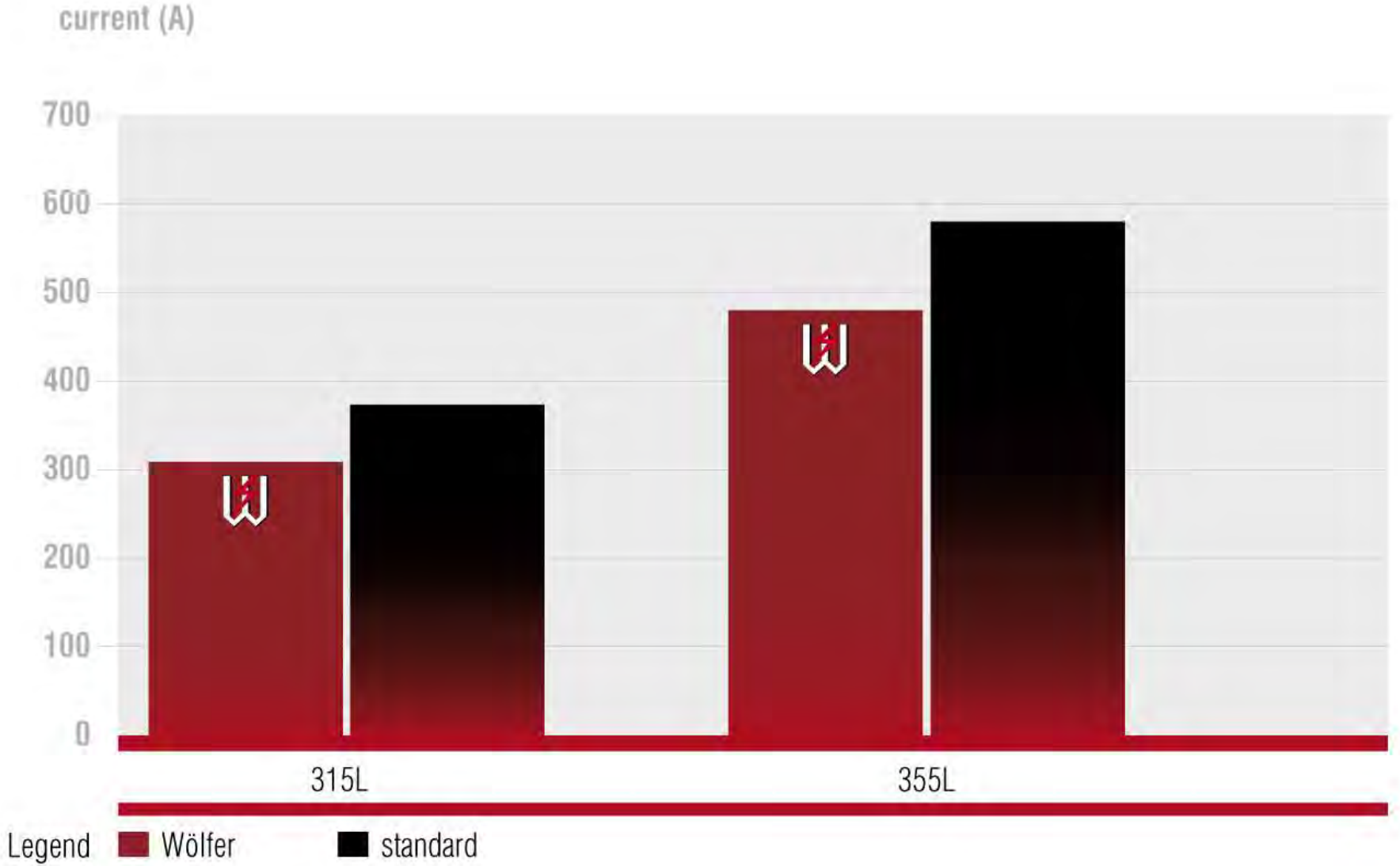
Life cycle costs



Service after commissioning



2 Efficiency

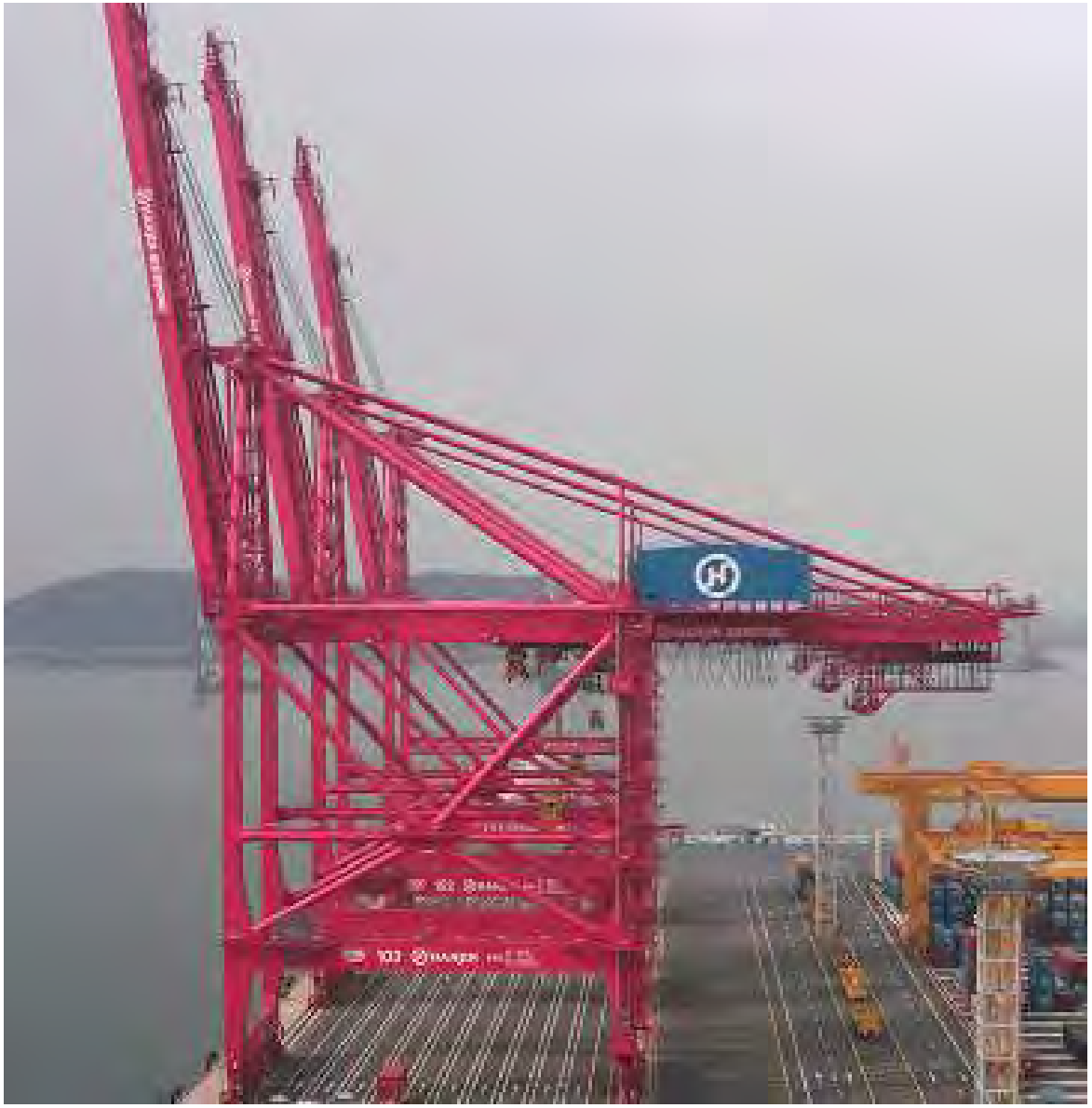


Comparison of 6 pole type, protection IP23, cooling IC06					
Competitor					
motor size	**power (kW)**	**voltage (V)**	**current (A)**	**pull-out torque (%)**	**moment of inertia**
355M	255	460	400	315	6
355L	290	460	450	319	6,7
355L	375	460	580	329	8,6
Wölfer					
280L	250	460	385	440	3,51
280X	300	460	465	405	4,6
315L	385	460	610	420	6,23
Competitor					
400M	450	460	706	352	8,2
400M	530	460	822	352	12,1
400L	560	460	880	370	14
Wölfer					
355L	480	460	815	440	8,2
355L	530	460	815	360	9,02
355L	580	460	910	400	9,84
Competitor					
450M	610	460	950	340	16,6
450L	700	460	1085	315	18,5
450L	760	460	1170	320	20,6
Wölfer					
355L	650	460	985	365	10,99
400L	700	460	1015	335	16,18
400L	750	460	1090	335	17,24

3 References

SSA Long Beach – USA; Electrical OEM - TMEIC

SSA Long Beach – USA Electrical OEM - TMEIC



Newport Terminal Busan – Korea
Electrical OEM - ABB

Hoist:

Motor type: ODRKF 355 L-6bbT

Power: 4 x 550 kW

Type of cooling: IC 06

Type of construction: IM B3

Newport Terminal Busan – Korea ODRKF355L-6bbT – 4x550kW

Ningbo – China RTG-Crane Kone (former Noell)

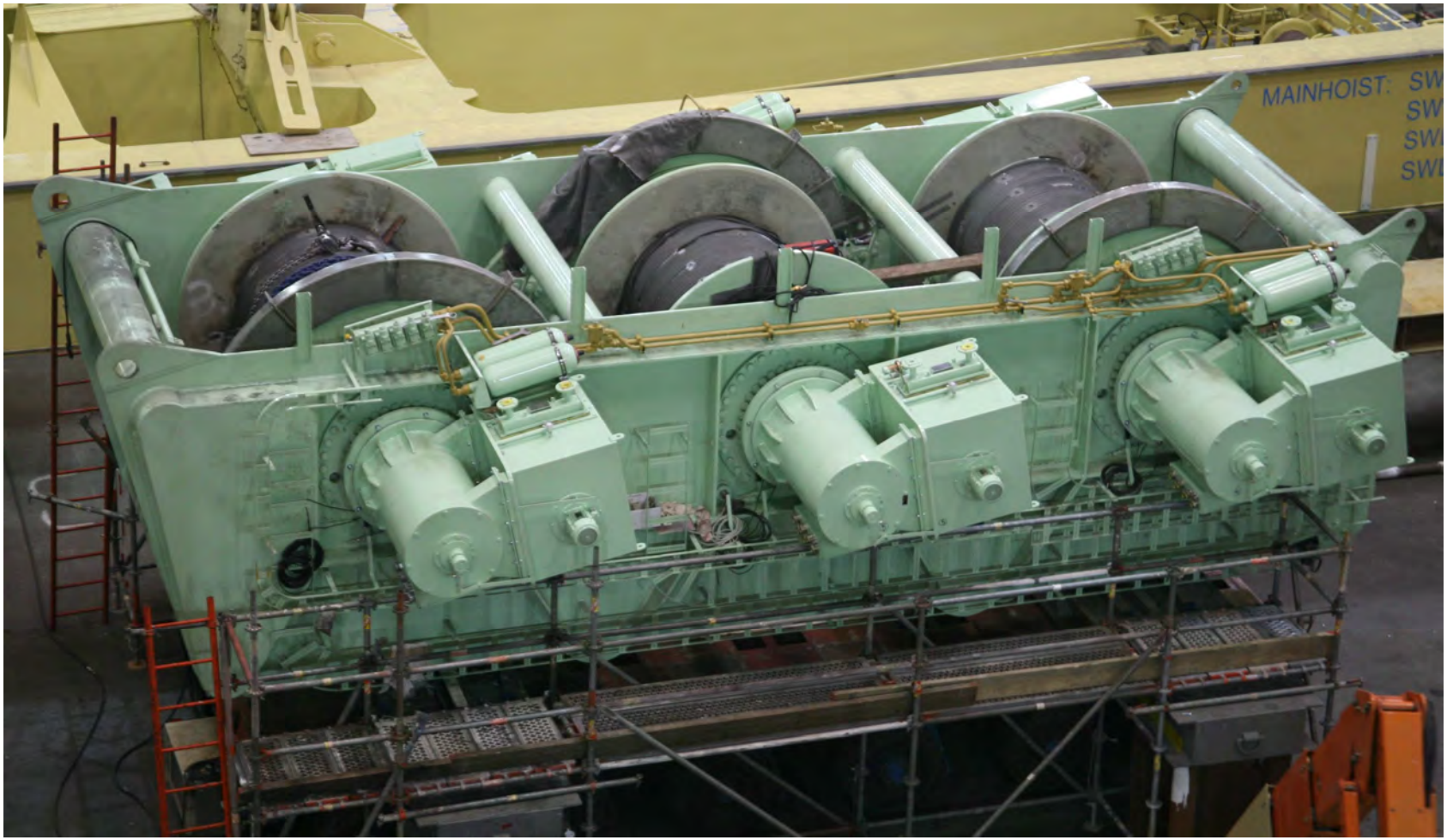
Hoist:
Motor type: DRKF 315 L-6bbbT
Power: 1 x 210 kW
Type of cooling: IC 416
Type of construction: IM B5

Trolley:
Motor type: DRKO 180 M-4bSFB10HT
Power: 2 x 15 kW
Type of cooling: IC 410
Type of construction: IM V1

Gantry:
Motor type: DRKO 200 L-4bSFB25HT
Power: 4 x 30 kW
Type of cooling: IC 410
Type of construction: IM V1

AGV – Kone (former Gottwald)– CTA – Hamburg, Germany

2 x 10.000 t crane Huismann/Netherlands


MAINHOIST:


5
50 LT
BROMMA
TITHHOOK

Thank you very much!