



SANDVIK MATERIALS TECHNOLOGY

SUPPORTING AUTOMOTIVE EVOLUTION



43,000
EMPLOYEES

91 BILLION SEK
INVOICED SALES

50
R&D CENTERS
GLOBALLY

SALES IN OVER

150

COUNTRIES
AROUND THE GLOBE

3.5 BILLION SEK
ANNUAL R&D
INVESTMENT

7,300
ACTIVE PATENTS AND
OTHER IP* RIGHTS



FULLY INTEGRATED PRODUCTION

We push metallurgical boundaries as the leading and innovative partner, we provide high integrity fluid systems for safe operation in critical services all around the world.



SANDVIK HPT – PRODUCT OFFERING



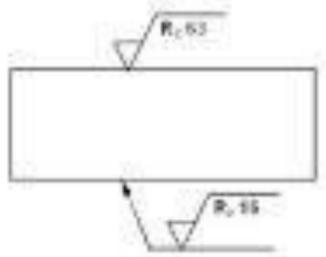
Size range

- OD from 0,8 to 135 mm
- Wall from 0,25 to 30 mm



Tolerances

- OD +/- 0,05 mm
- ID +/- 0,05 mm
- Wall thickness +/- 7,5 %



Surface requirements

- OD + ID Ra max. 0,5 μ m
- ID defects max. 20 μ m
- Outside surface bright or pickled or ground

Lengths

- Random lengths 4 – 6 Meter
- Cut lengths 2 to 10 Meter
- Coils on request



Approvals

- ISO 9001, EN 9100
- ISO 14001
- OHSAS 18001
- Accreditation ISO 17025
- ISO 50001
- NORSOK TR2000

Implementation 2018

- IATF16949
- NADCAP - Q2 2018



Grades

- Austenitic TP 304, 316, 316 TI, 904 L
- Duplex, Superduplex
- Nickel based Alloys 600, 601, 625, 825
- Special alloys 254 SMO, Alloy 286



Strengths of Sandvik High Precision Tube

- Flexible tube mill with international background
- Tubemill with focus on niche products
- Integrated quality system from melt to final product



HIGH PRESSURE FATIGUE TESTS

STATE OF THE ART

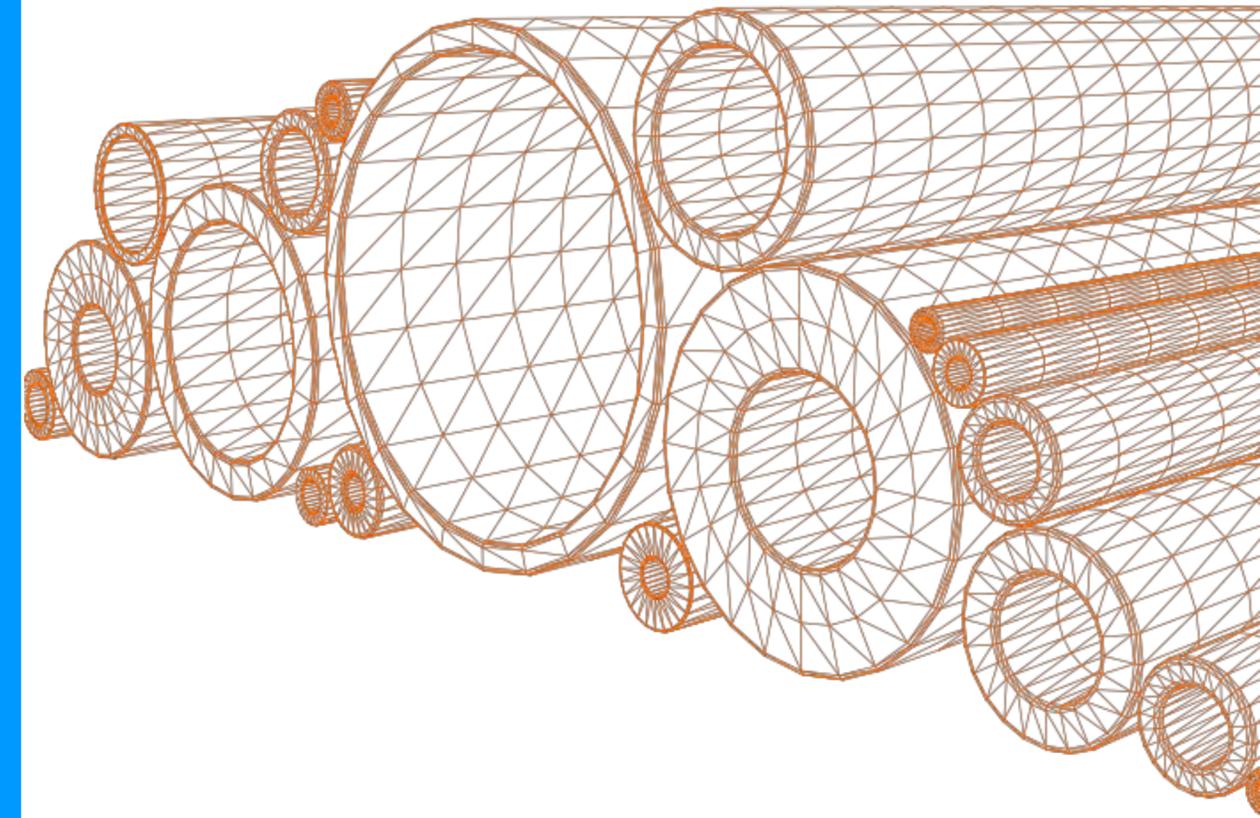
MAXIMATOR
Maximum Pressure.

High Pressure fatigue test

1. Pressure 100 - 3500 bar
2. Temperature chamber -60°C - 150°C



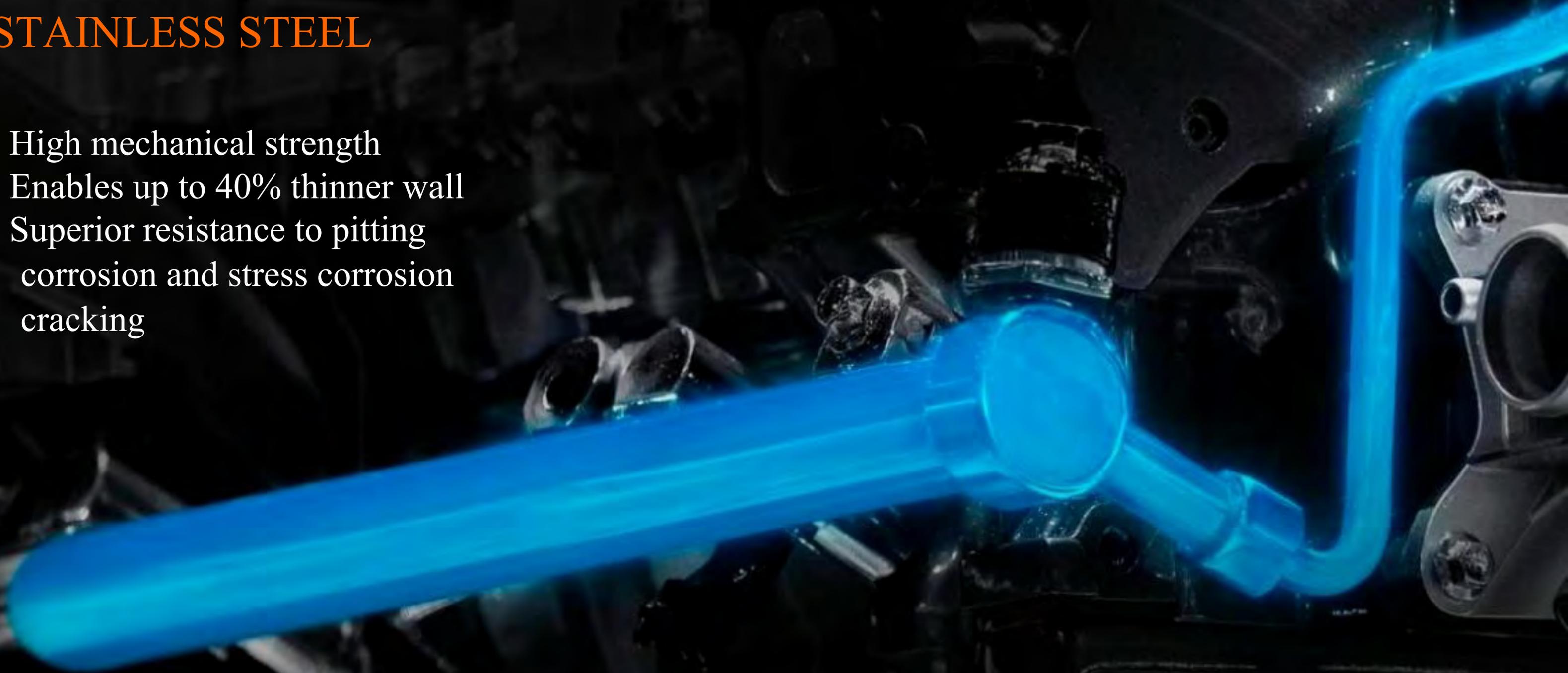
SUPPORTING AUTOMOTIVE EVOLUTION – PFXP FOR GDI



DUPLEX STAINLESS STEEL

OFFERS ADVANTAGES FOR GDI SYSTEMS COMPARED TO AUSTENITIC STAINLESS STEEL

- High mechanical strength
- Enables up to 40% thinner wall
- Superior resistance to pitting corrosion and stress corrosion cracking



MECHANICAL PROPERTIES

- UNS S32304 has twice the yield strength of UNS S30403.

TENSILE STRENGTH COMPARISON

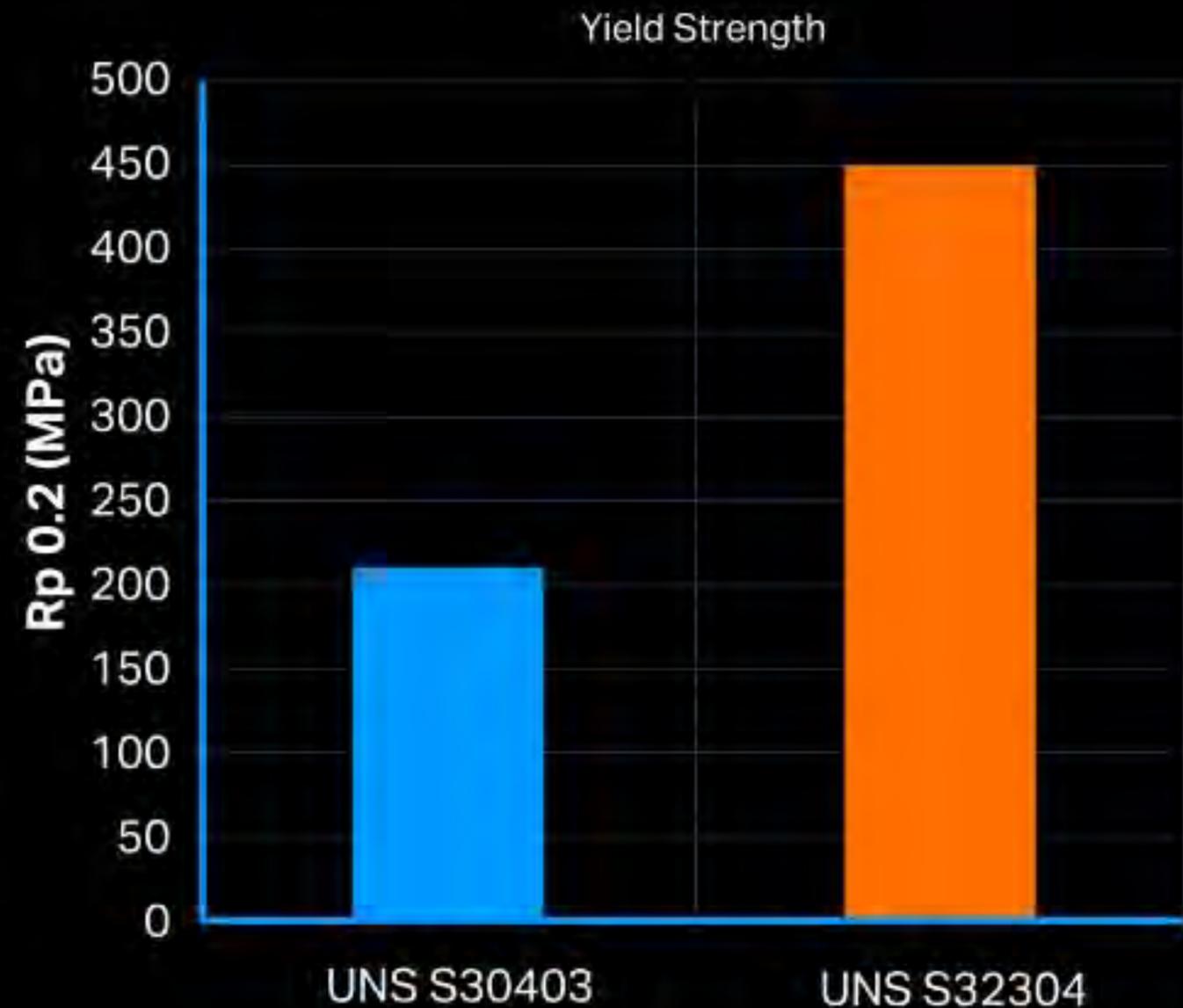
UNS S30403: 515 – 690 MPa

UNS S32304: 690 – 820 Mpa

IMPACT STRENGTH COMPARISON

UNS S30403: 300 J or higher

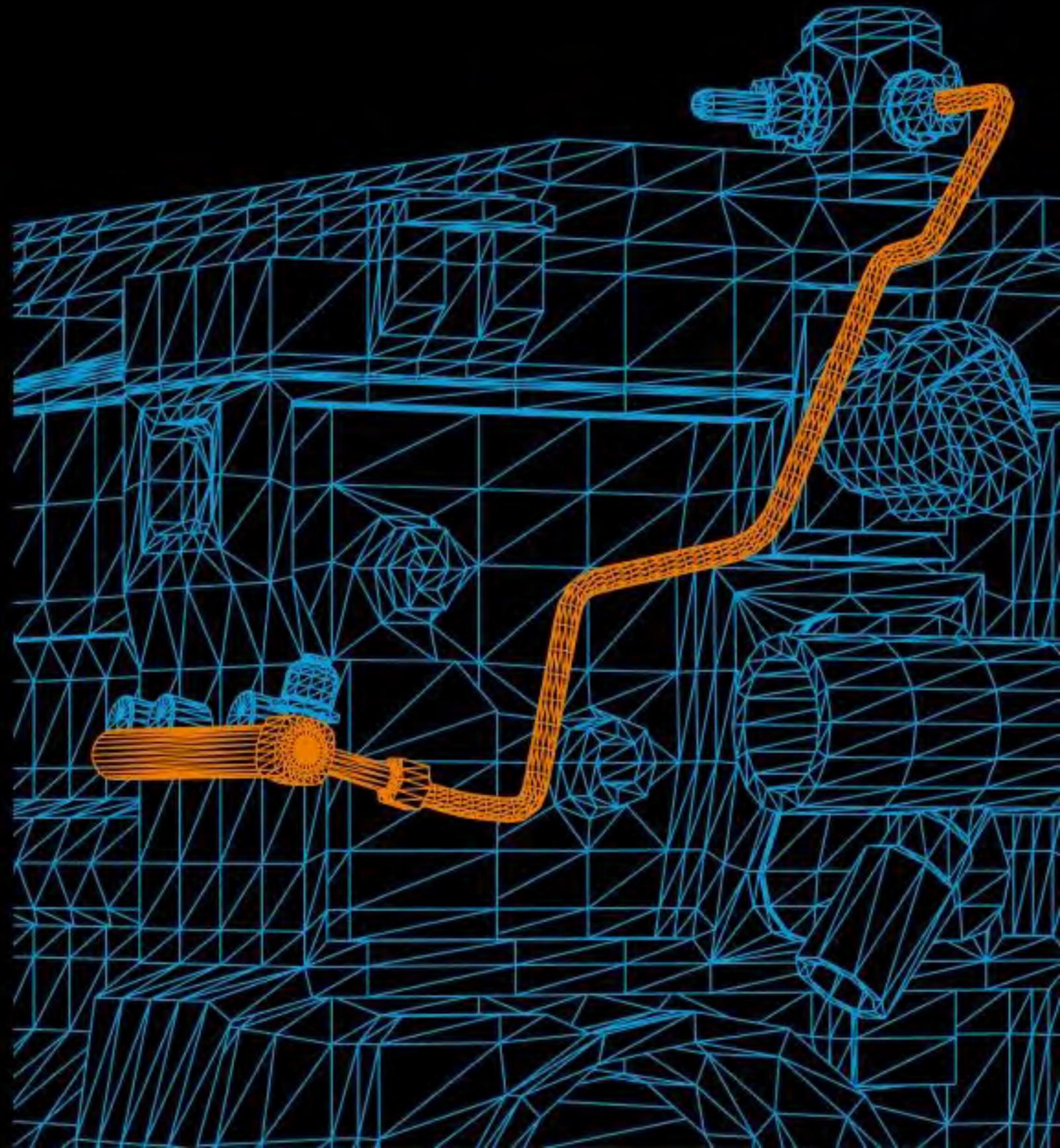
UNS S32304: around 300 J



PRESSURFECT™

DEVELOPED FOR BOTH FUEL RAIL AND FUEL LINE APPLICATIONS

- High mechanical strength
- Excellent toughness
- Good corrosion resistance
- Excellent bendability for fuel lines



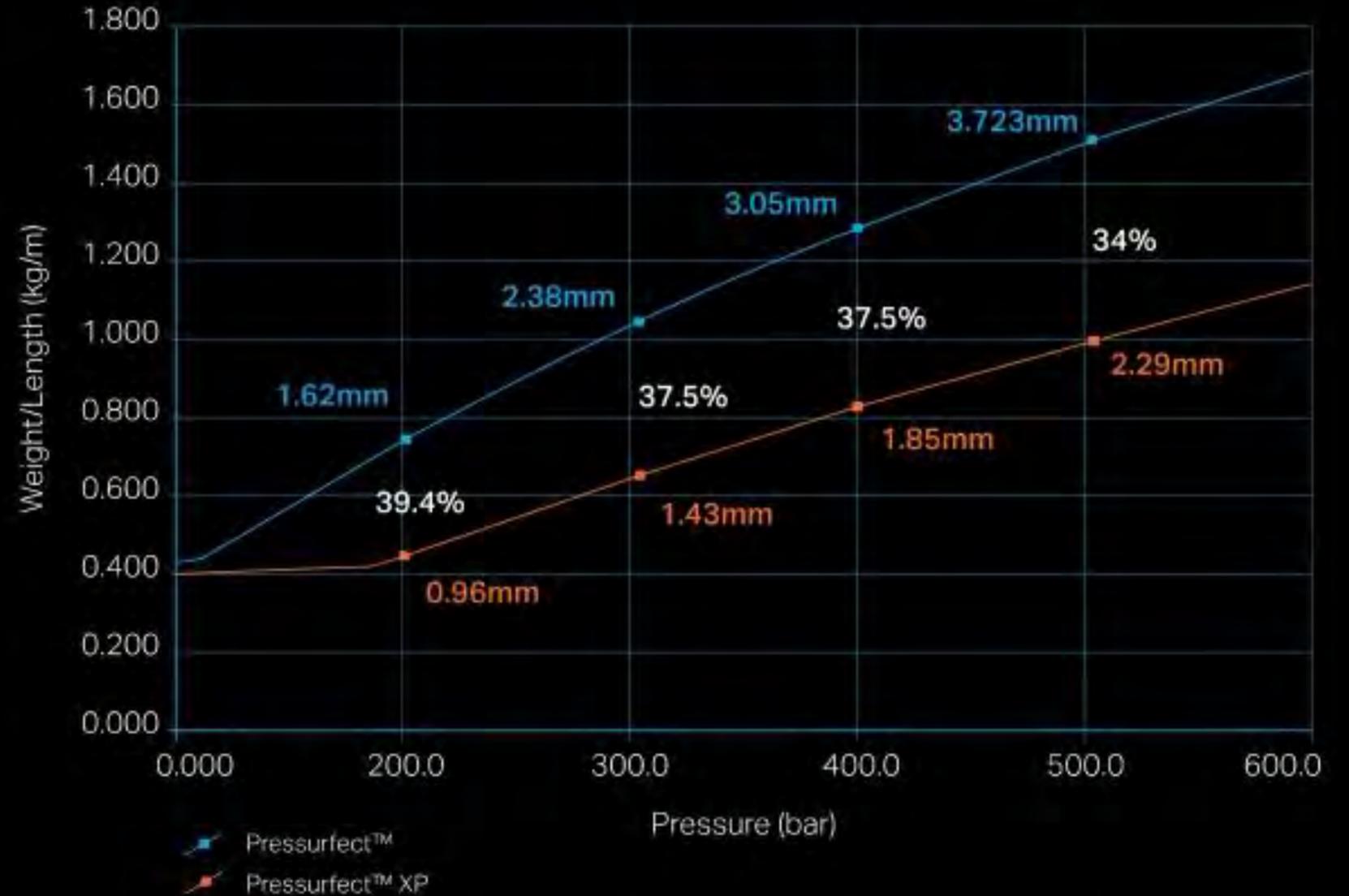
WEIGHT TO PRESSURE RATIO COMPARISON

Cost efficiency

Pressurfect XP™



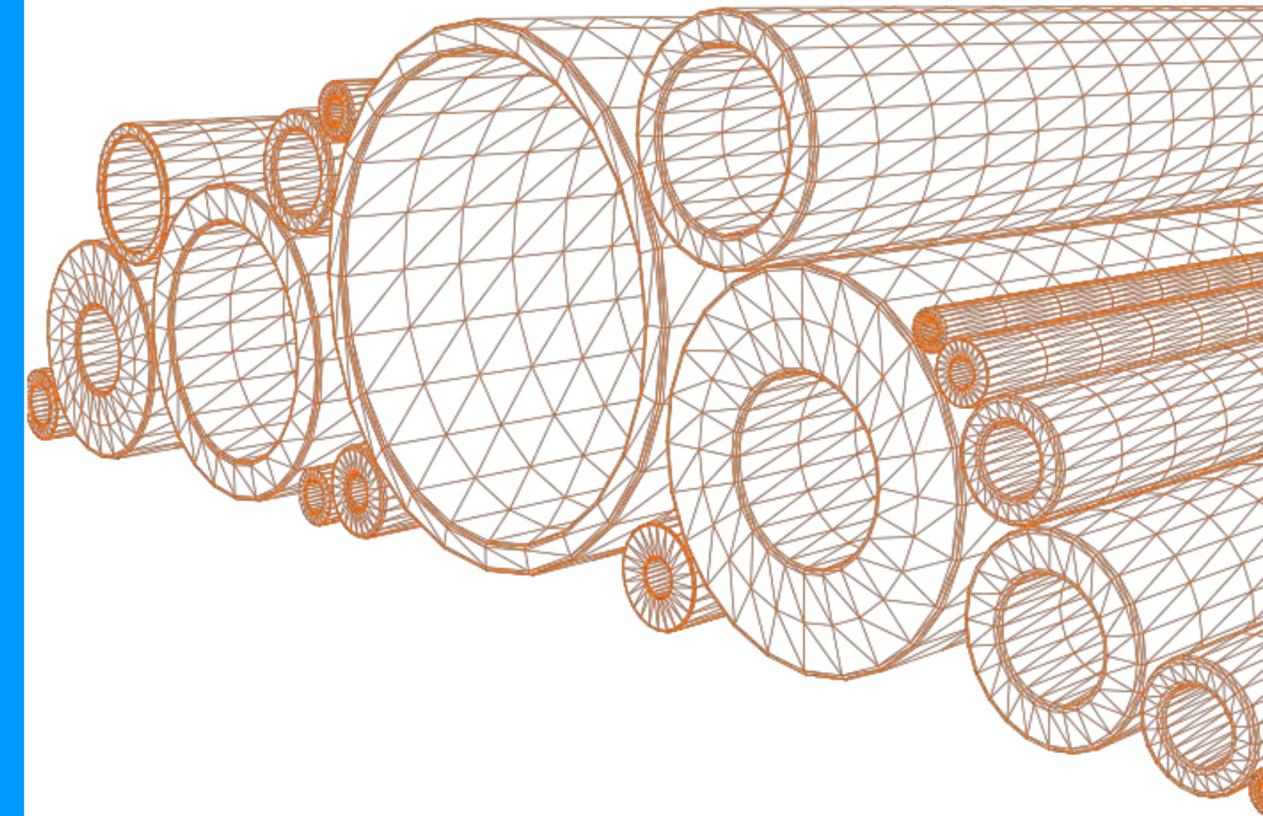
Fuel rail weights for desired design pressures (20mm OD fuel rail)
Pressures calculated according to ASTM B31.3



Values in mm are required minimum wall thickness at given pressures
Percentages are difference in tube weight at given pressures



SUPPORTING AUTOMOTIVE
EVOLUTION – HP120 FOR
HYDROGEN FUEL SYSTEMS



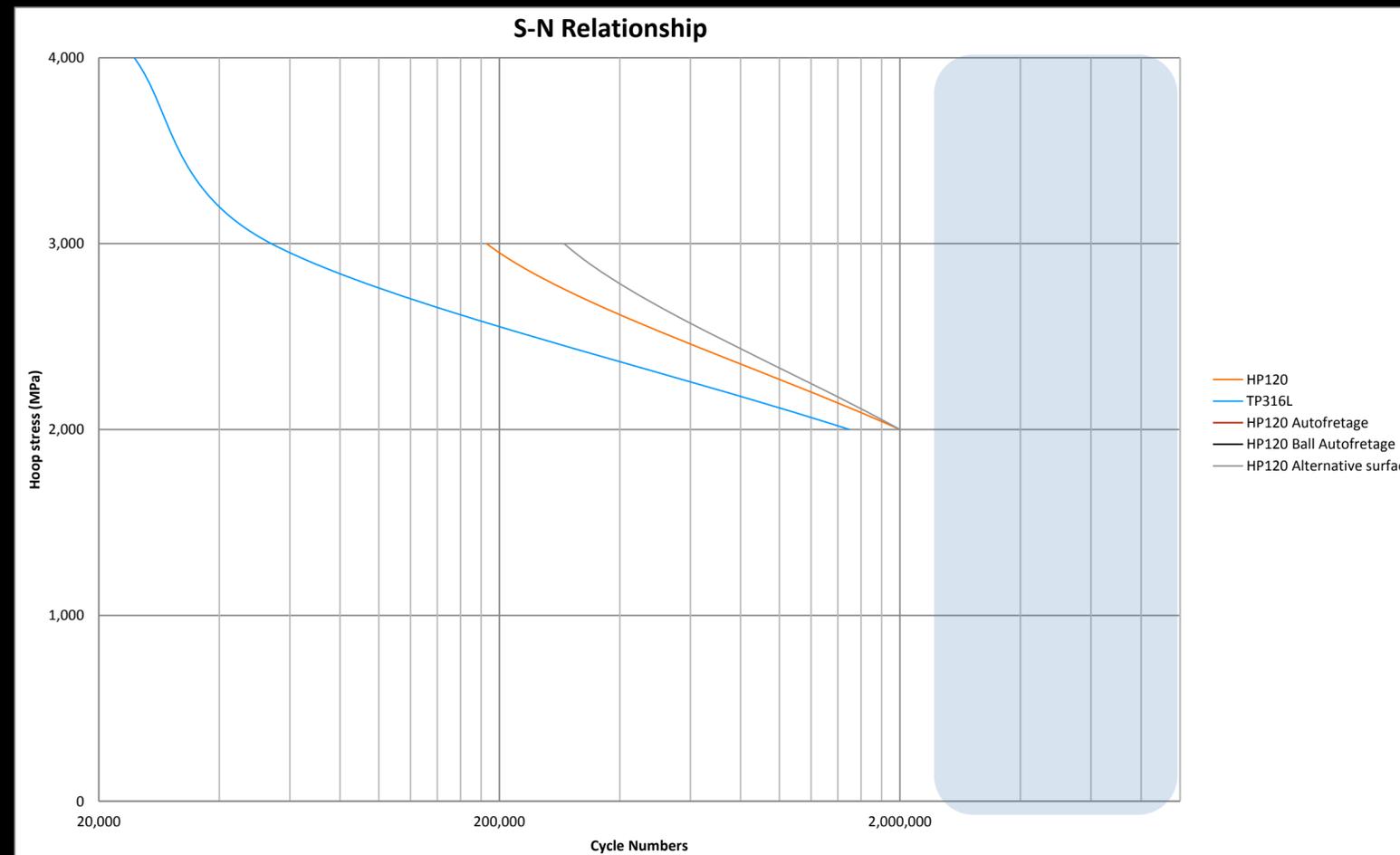
PRODUCT DEVELOPMENT

FUTURE GRADE HP120 / H2-120

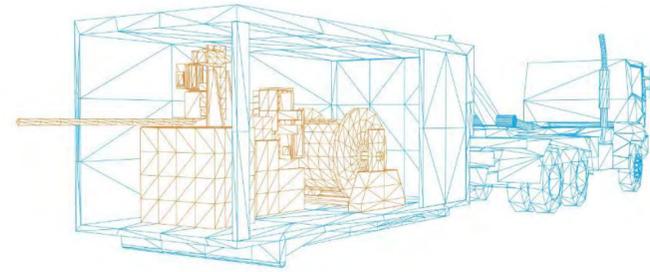
HP120 is an austenitic grade with a high level of Mn, a low level of Ni and the addition of N. The grade is characterized by:

- High mechanical strength in the hard condition
- Very good impact toughness in temperatures down to -230°C (-382°F)
- Very good high temperature oxidation resistance
- Very good Fatigue properties

Material	HP120	TP316	
Rp0,2	899	780	N/mm ²
Rm	1036	861	N/mm ²
A%	24,5	25,5	%
Fehlertiefe	64 µm	54 µm	µm
Innen Ø	3,25 mm	3,25 mm	mm



THE DIGITAL PRODUCTION SYSTEM ONSITE



Start 2018-04

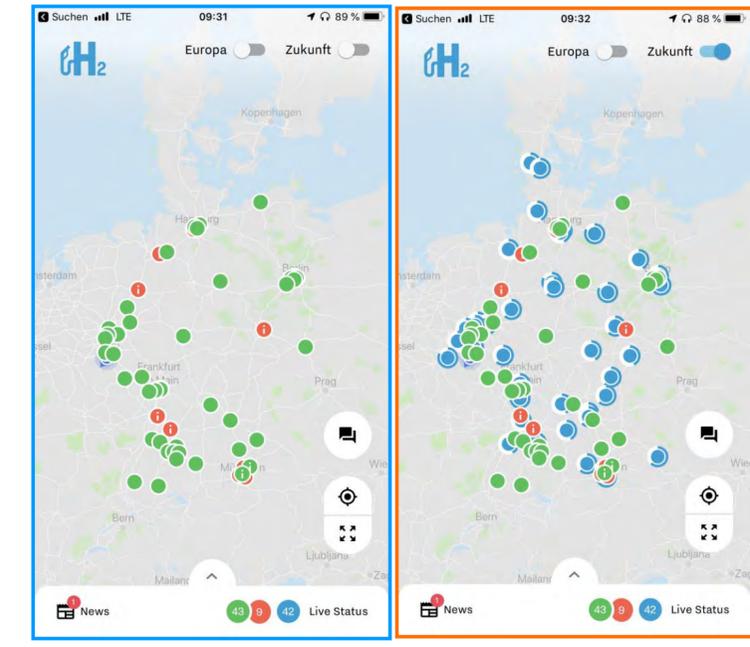
2018-10

2019

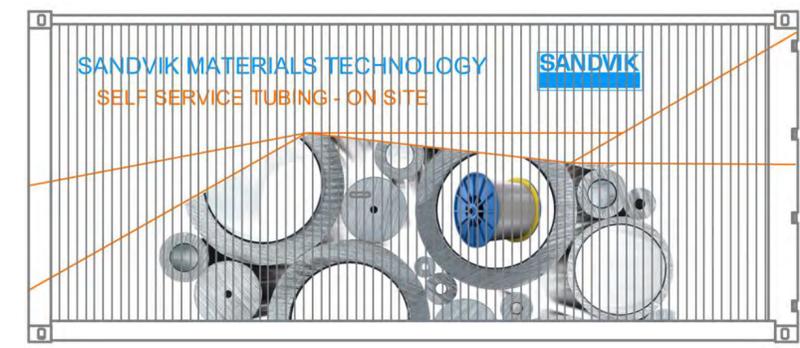
9 installations

6 in order

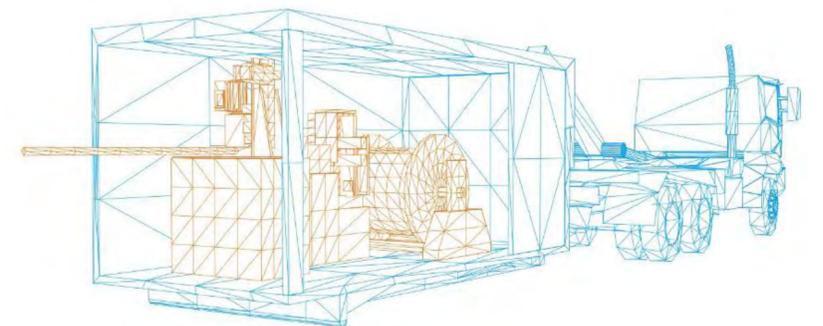
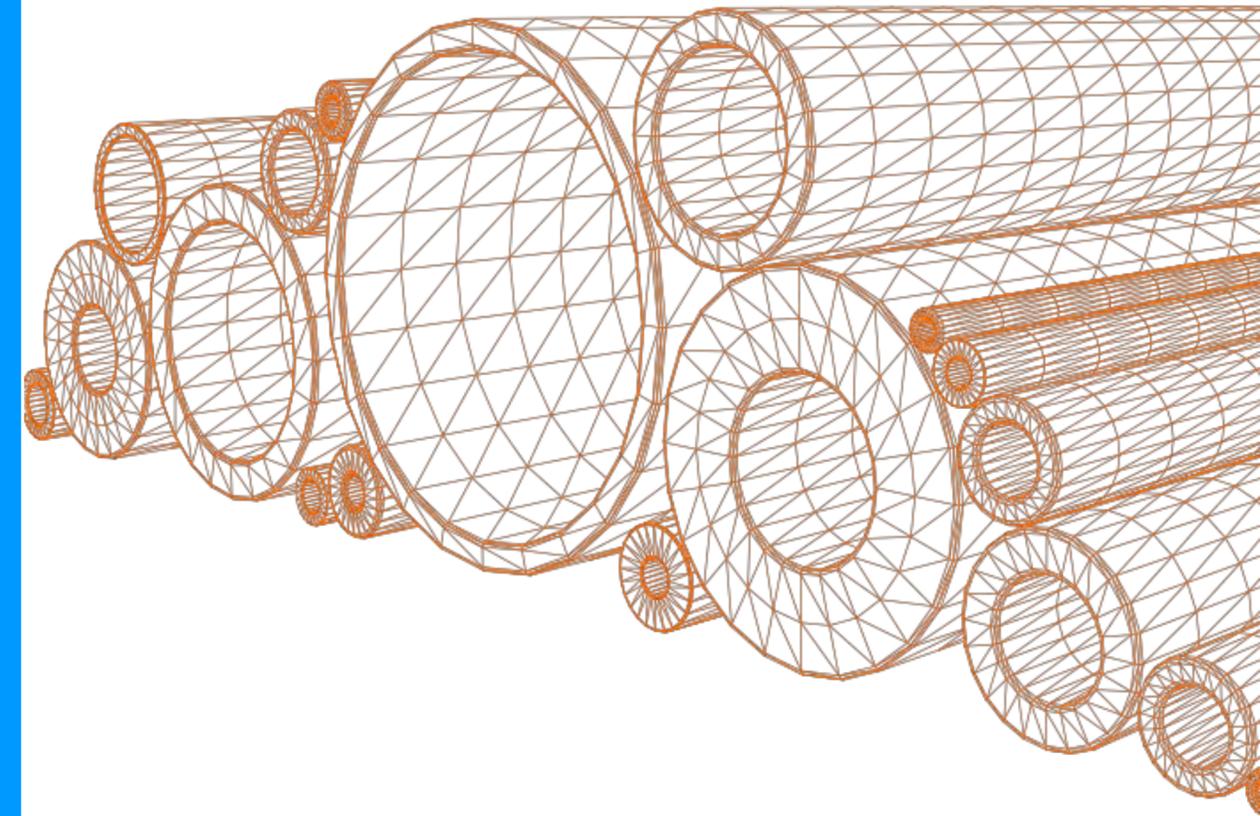
Forecast 20 installations



H2 GAS STATION

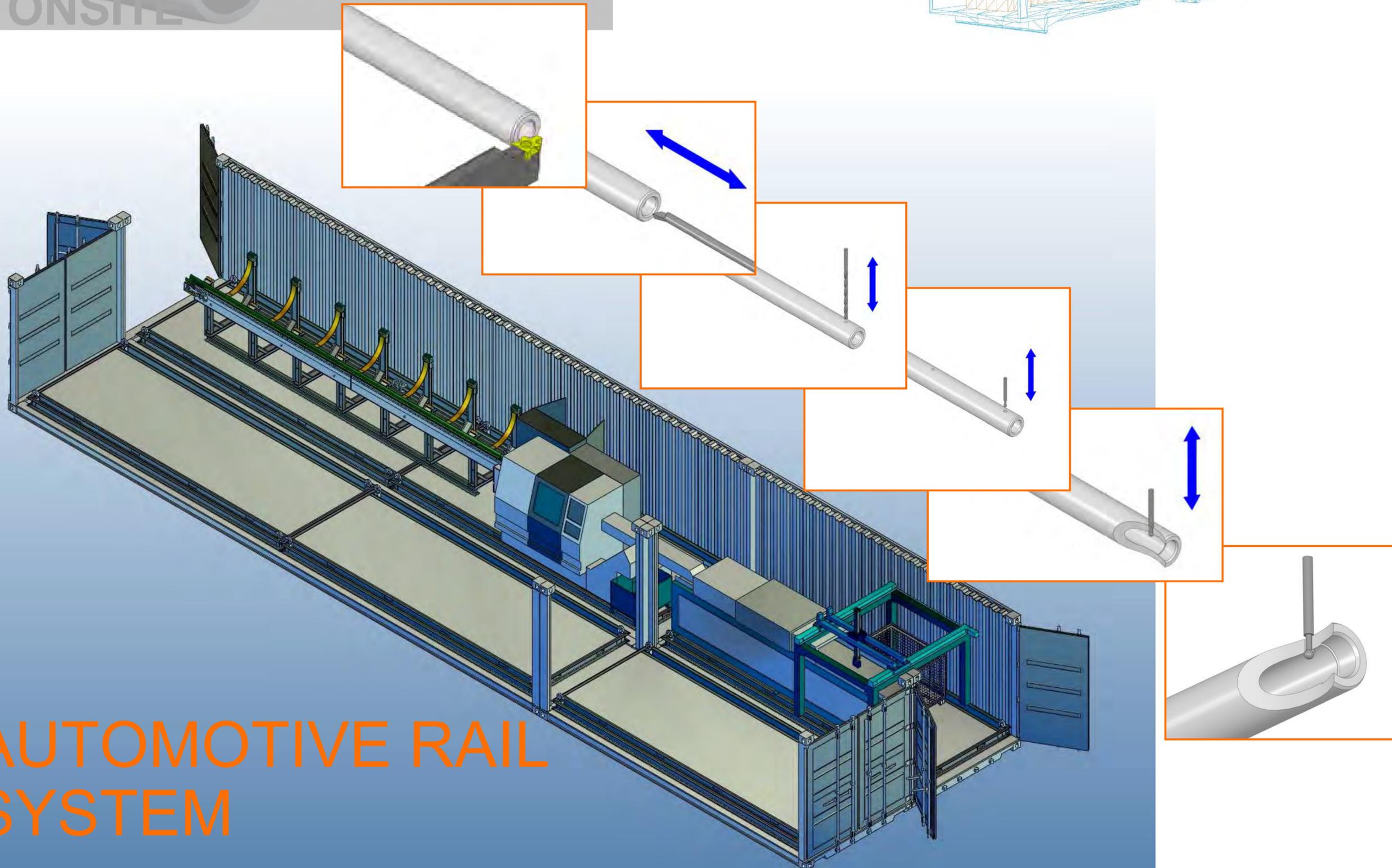
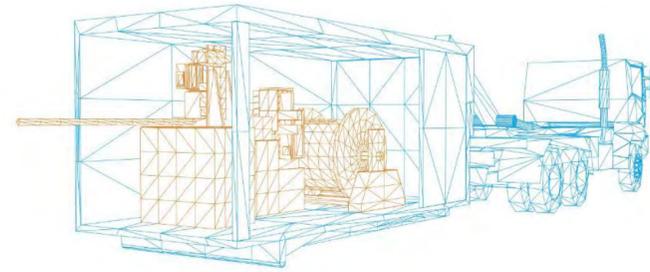


DIGITAL TUBE PRODUCTION IN AUTOMOTIVE APPLICATIONS



THE DIGITAL PRODUCTION SYSTEM

ONSITE



AUTOMOTIVE RAIL SYSTEM

THE DIGITAL PRODUCTION SYSTEM

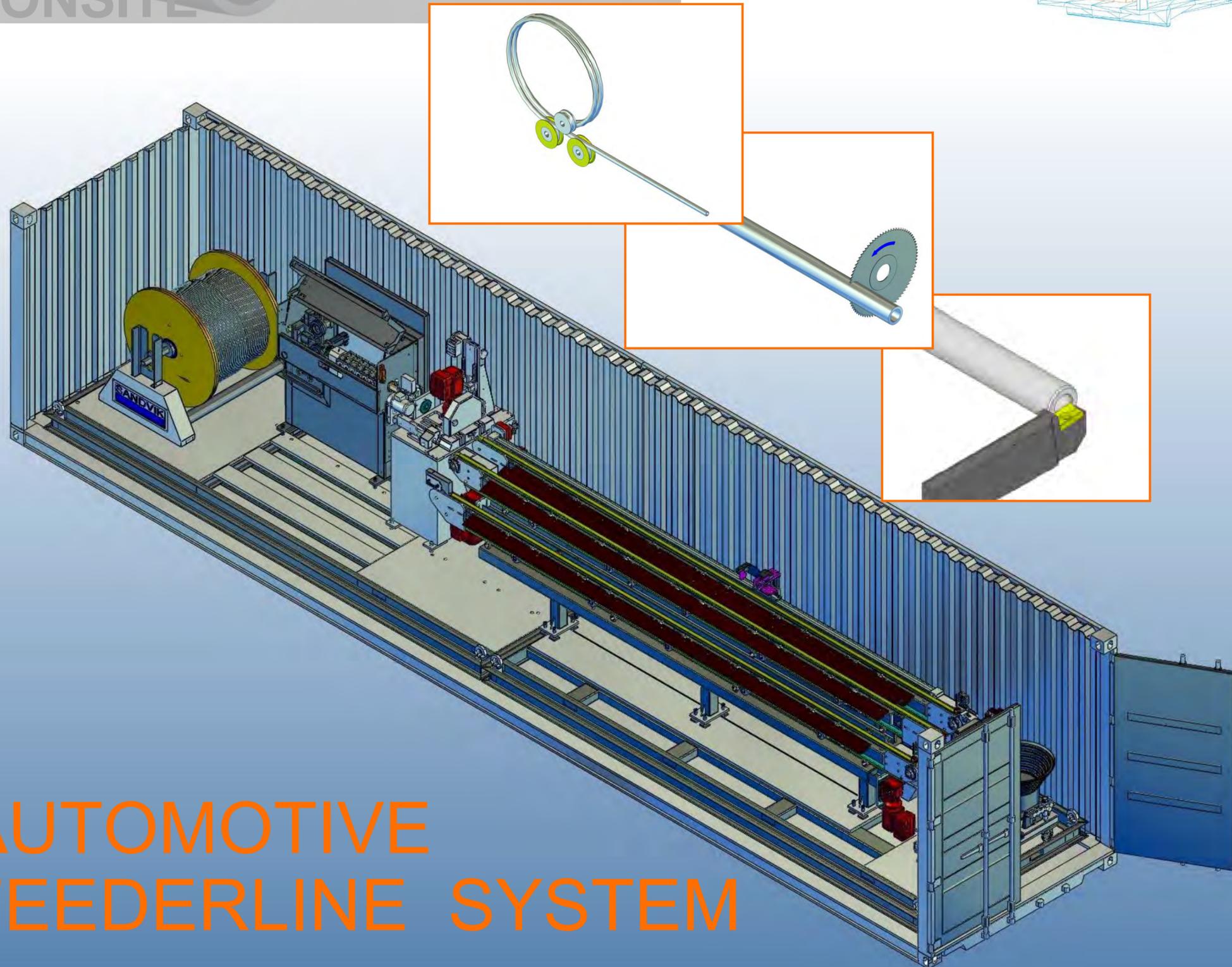
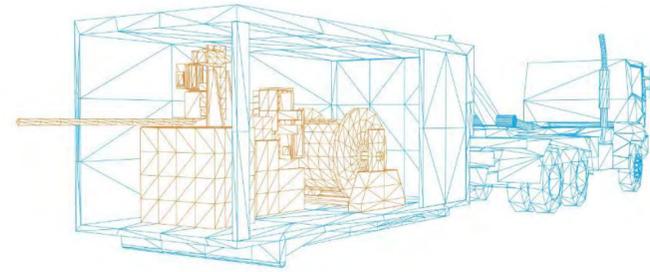
Production Concept

- From tube to a final rail tube in a mobile production unit
- Customized on automotive customer needs
- One system for global supply



THE DIGITAL PRODUCTION SYSTEM

ONSITE



AUTOMOTIVE FEEDERLINE SYSTEM

THE DIGITAL PRODUCTION SYSTEM

Production Concept

- From tube to a final fix length cut tube in a mobile production unit
- Customized on customer needs
- One system for global supply
- Show case in order process



INNOVATION AND PARTNERSHIP

We are responsive to new technologies and trends, meeting future challenges

We promote a culture, where we dare to try and we dare to fail

We develop material solutions that make our customers successful in their mission

