



coperion

Compounding Solutions for an Optimized Productivity

Roadshow India Feb 2025

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Introduction of Coperion Nanjing



Founded: 2004

Employees: 270+

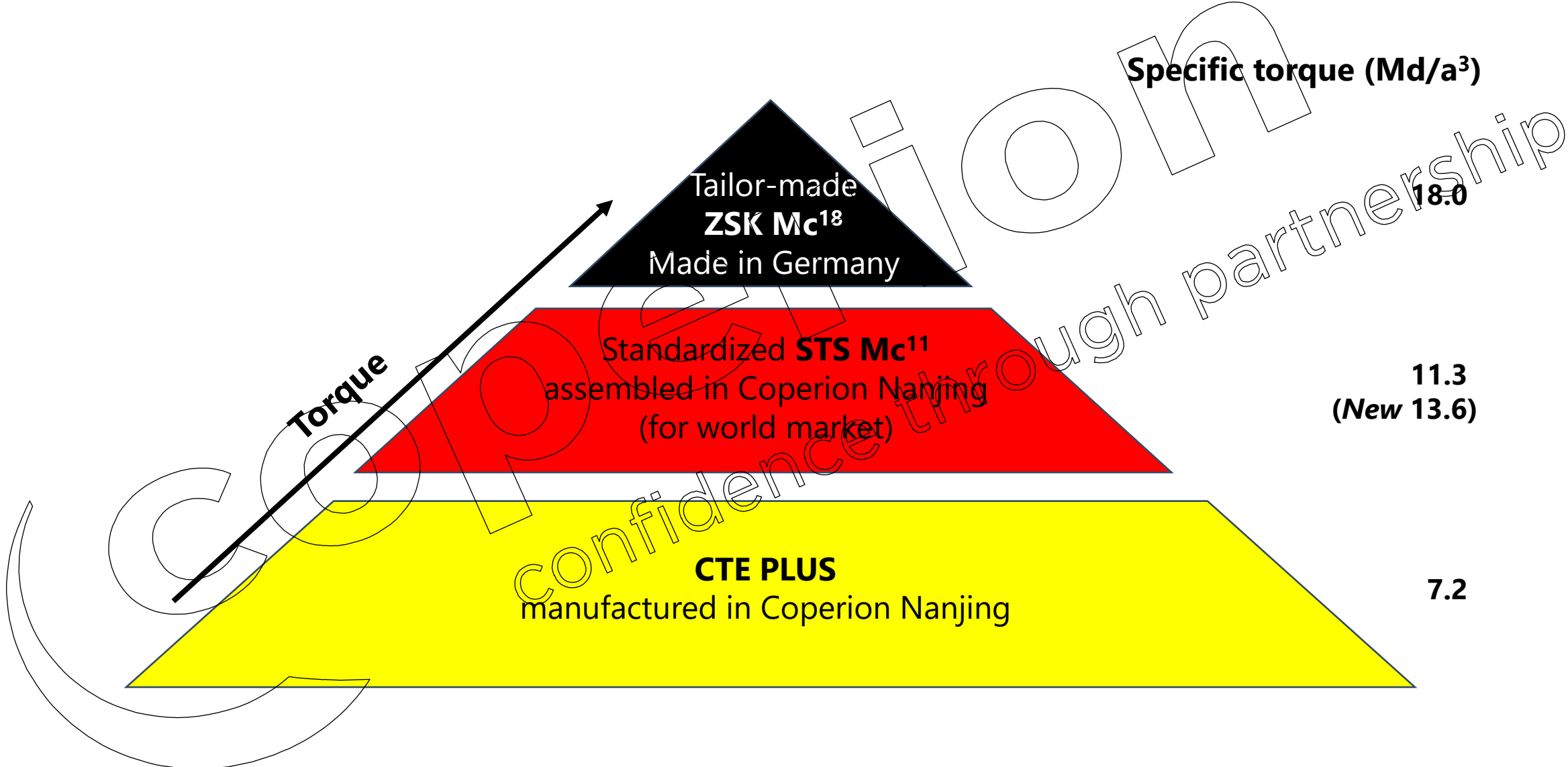
Workshop: 11,000 m²

Office: 5,000 m²

Annual production capacity:

- Twin screw extruder 350 sets
- Loss-in-weight feeder 800 pcs
- Rotary valve 800 pcs
- Gearbox 150 pcs

Product Range



Historical Developments of ZSK and STS

ZSK Standard

1955

$$D_o / D_i = 1,22$$

$$M_d / a^3 = 4,0 \text{ Nm/cm}^3$$

$$n = 150 \text{ min}^{-1}$$

ZSK variable

1963

$$D_o / D_i = 1,44$$

$$M_d / a^3 = 5,0 \text{ Nm/cm}^3$$

$$n = 300 \text{ min}^{-1}$$

ZSK Supercompounder

1983

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 8,7 \text{ Nm/cm}^3$$

$$n = 600 \text{ min}^{-1}$$

ZSK MEGAcampounder

1995

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 11,3 \text{ Nm/cm}^3$$

$$n = 1200 \text{ min}^{-1}$$

ZSK MEGAcampounder PLUS; 2004

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 13,5 \text{ Nm/cm}^3$$

$$n = 1200 \text{ min}^{-1}$$

ZSK Mc¹⁸

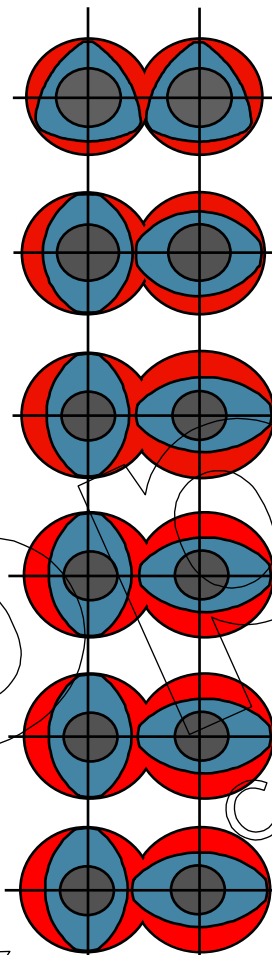
2010

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 18 \text{ Nm/cm}^3$$

$$n = 1200 \text{ min}^{-1}$$

ZSK



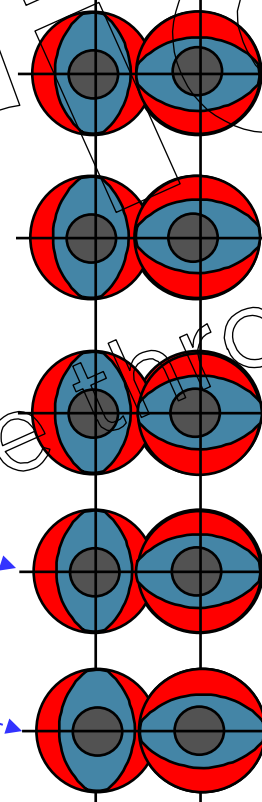
Distance between Axis is constant

Free volume increased (100%) & increased torque density

Free Volume increased (40% extra)

Torque increase

STS



STS
2004

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 8,7 \text{ Nm/cm}^3$$

$$n = 600 \text{ min}^{-1}$$

STS advanced

2008

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 8,7 \text{ Nm/cm}^3$$

$$n = 800 \text{ min}^{-1}$$

STS advanced

2010

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 10,0 \text{ Nm/cm}^3$$

$$n = 800 \text{ min}^{-1}$$

STS Mc11

2015

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 11,3 \text{ Nm/cm}^3$$

$$n = 900 \text{ min}^{-1}$$

STS McPlus

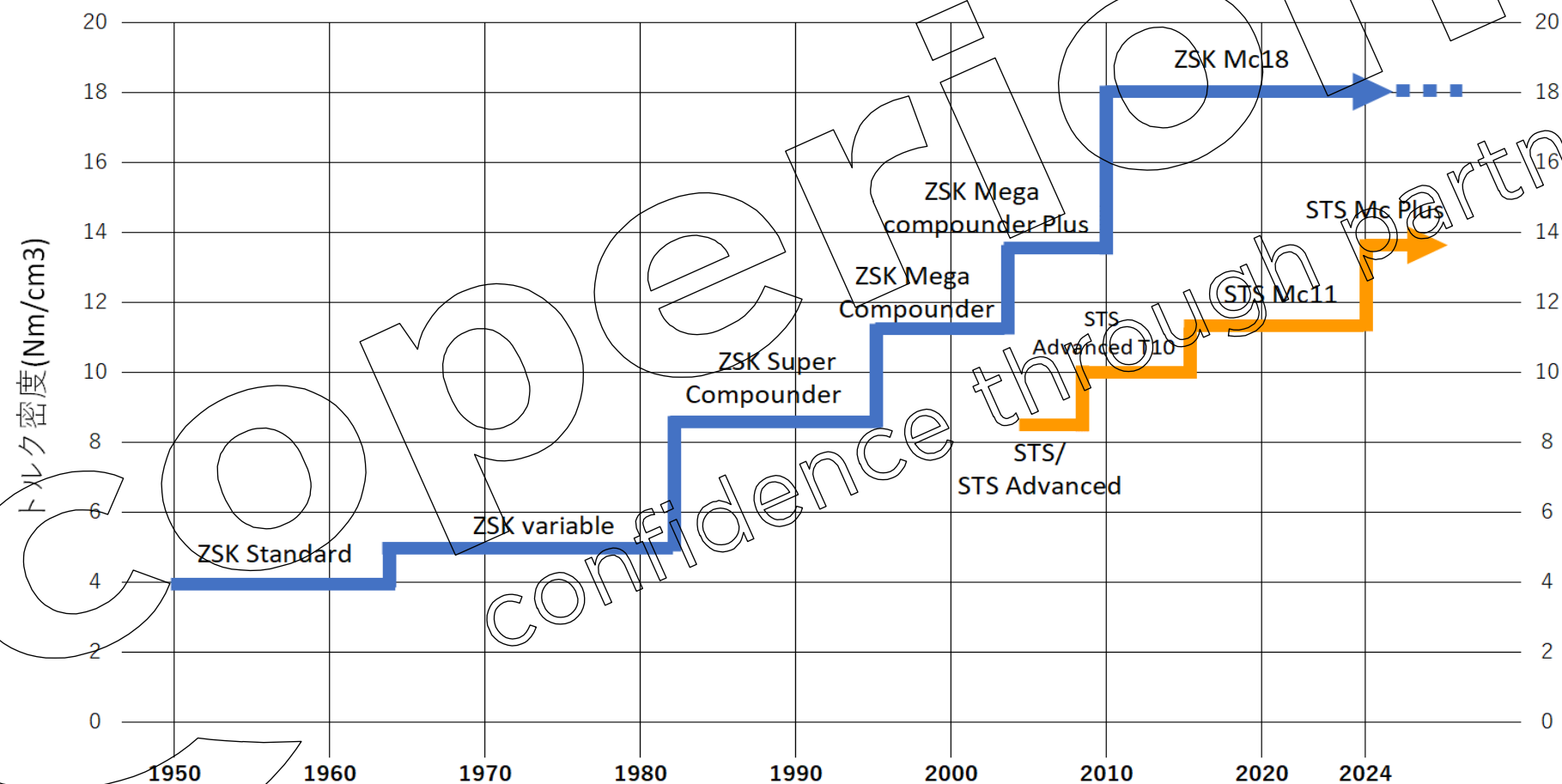
2024

$$D_o / D_i = 1,55$$

$$M_d / a^3 = 13,6 \text{ Nm/cm}^3$$

$$n = 900 \text{ min}^{-1}$$

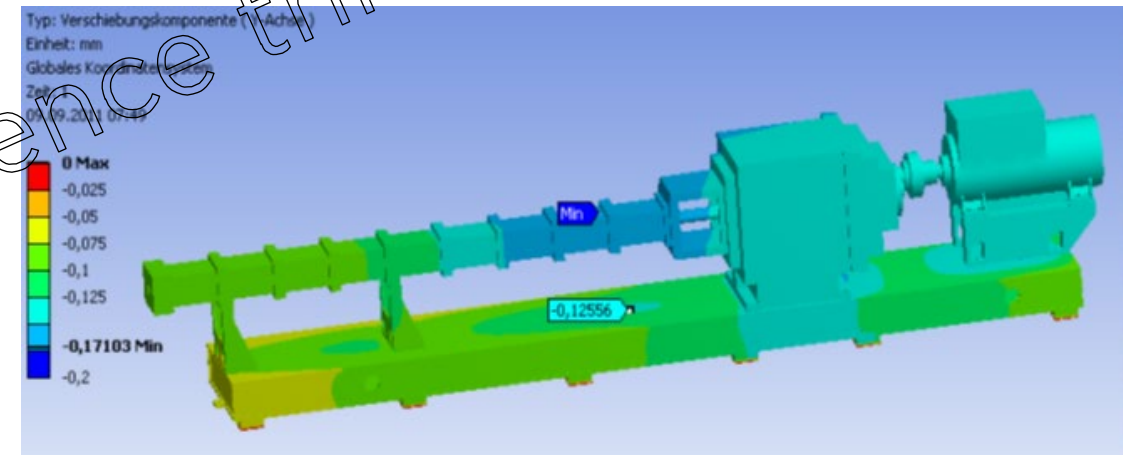
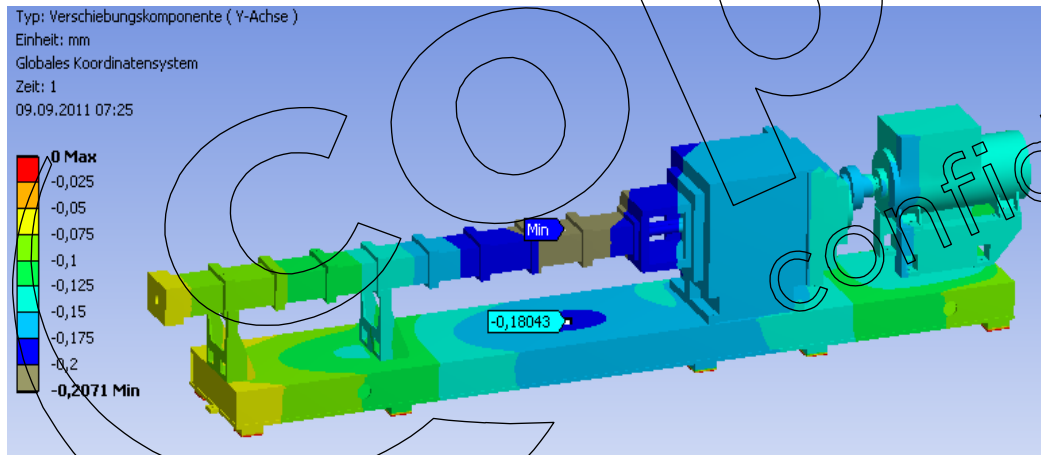
Torque increase of ZSK and STS



FEA for The Power Train of STS Mc¹¹

- ✓ Sharing the gearbox design with ZSK extruder, all the T11.3 gearboxes are analyzed in the whole power train to improve the stiffness and reduce the deformation of the extruder.
- ✓ The noise and vibration of the whole machine is reduced effectively

**ENGINEERED
IN GERMANY** 



Key Components Manufactured in House



In-house manufacturing to ensure **optimum quality**

Welding of Barrels with Special Welding Process

- ✓ Pre-heated in furnace from Germany before welding to avoid stress and afterwards crack and leakage in future.
- ✓ Welding the barrel at high temperature, to avoid stress.
- ✓ Welding with Specialized American welding machine to achieve good welding quality
- ✓ Leakage check for every barrel with high pressure

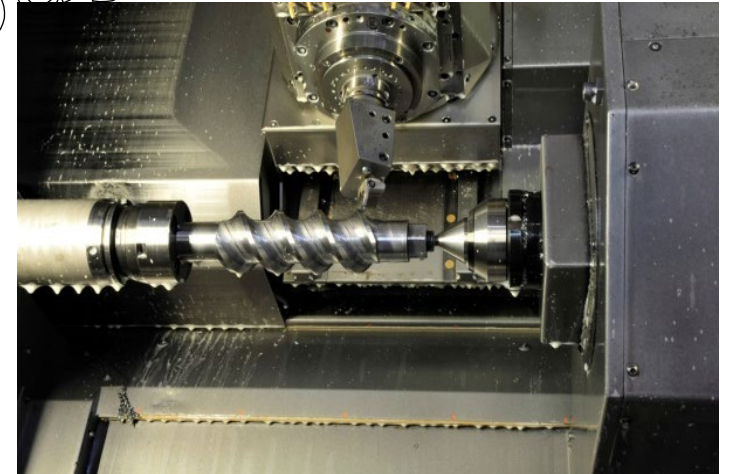
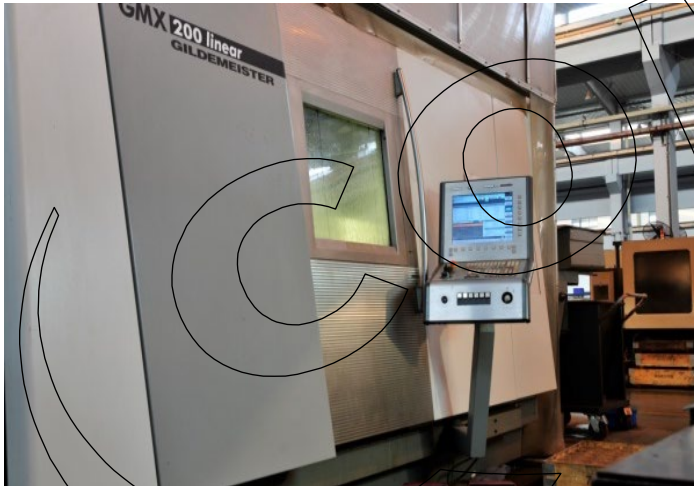


Additional manufacturing procedures to improve machine quality and reliability.

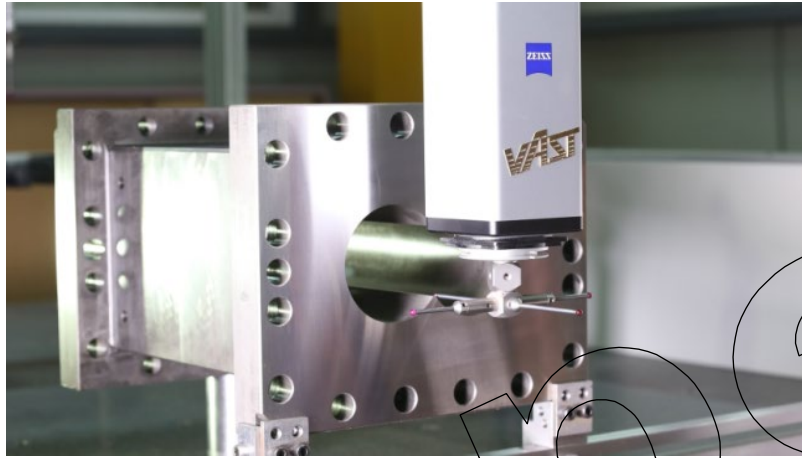
Screw Elements

Advantages

- ✓ High precision of element profiling
- ✓ Better elements conformity
- ✓ High productivity



Zeiss 3-dimension Inspection Center



- ✓ Dimension check range up to micron level (measuring accuracy is 1.4 micron)
- ✓ Special designed temperature sensor can offer extremely reliable temperature compensation to ensure the precision
- ✓ Each and every barrel is inspected around 80 items during the production
- ✓ Each and every CTE gearbox housing is inspected around 40 items during the production

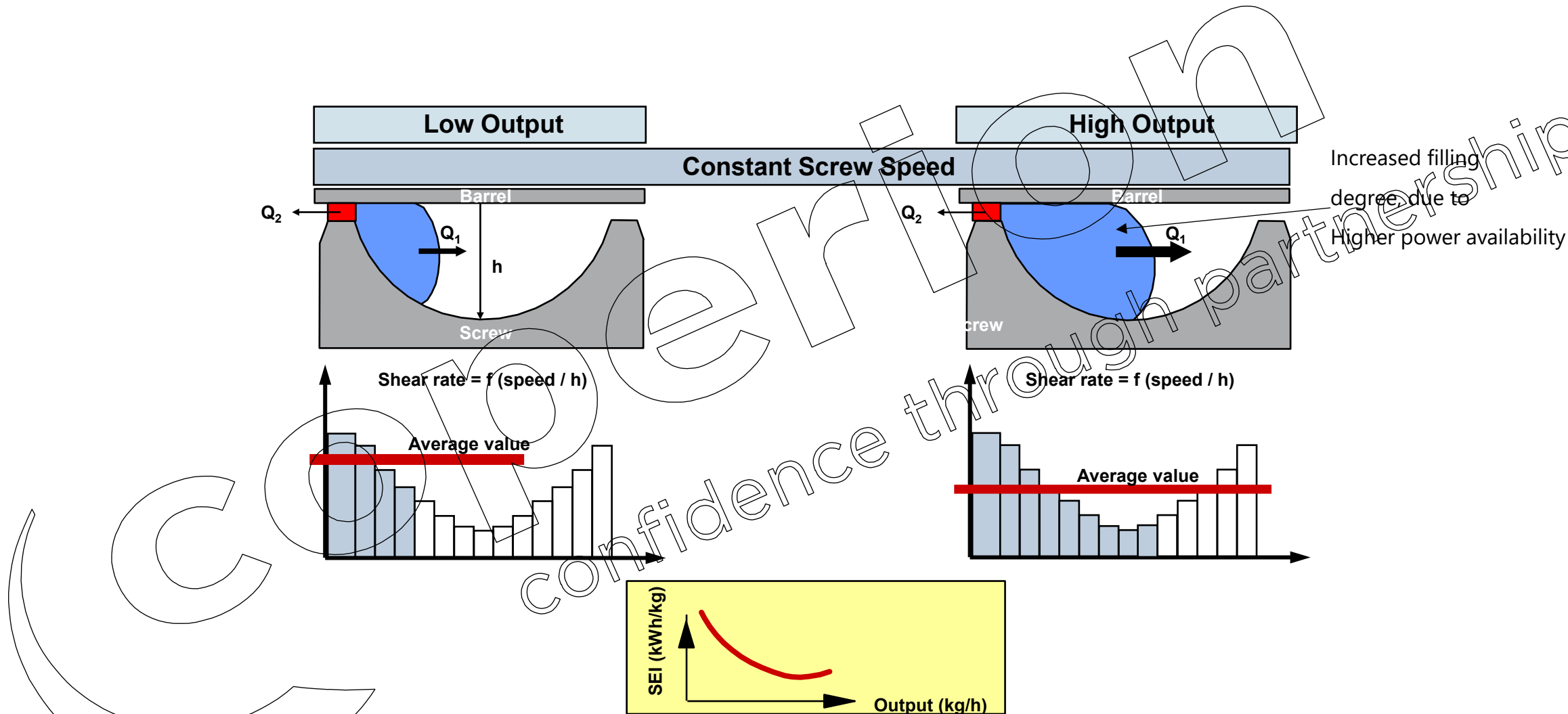
Highlights of STS 75 Mc PLUS

New features of the Mc Plus series

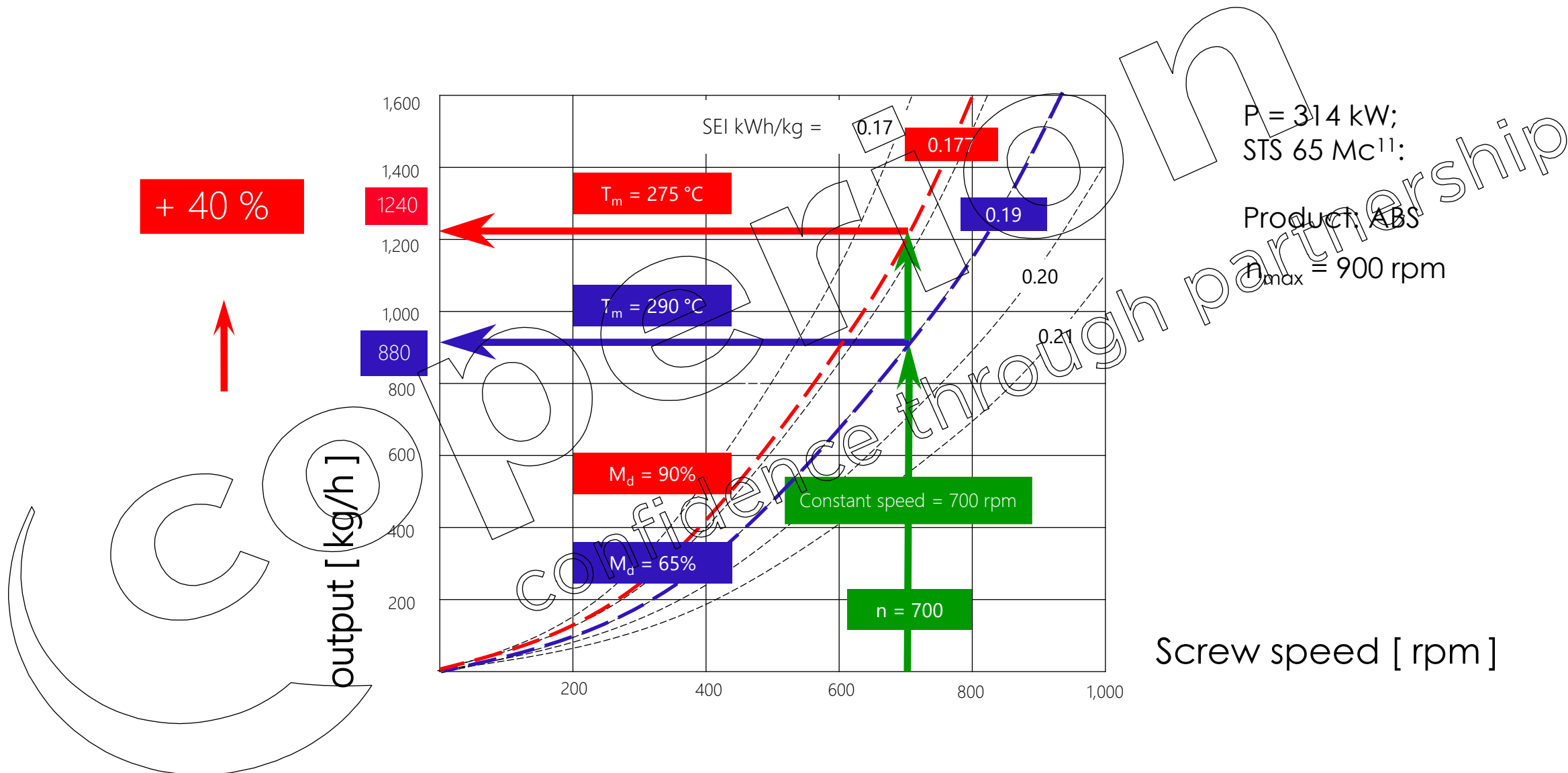
- Specific torque (Md/a^3) increased from 11.3 Nm/cm³ to 13.6 Nm/cm³
- 20% throughput increase with increased torque
- Lower melt temperature and SEI due to higher filling degree
- Robust and reliable European gearbox with high safety factors
- Optimized screw shaft sealing to avoid powder leakage
- Heating cartridge design for uniform heating
- Optimized cooling channels for better cooling efficiency
- Cold hammered screw shafts
- All key components manufactured in house
- Coperion quality standards



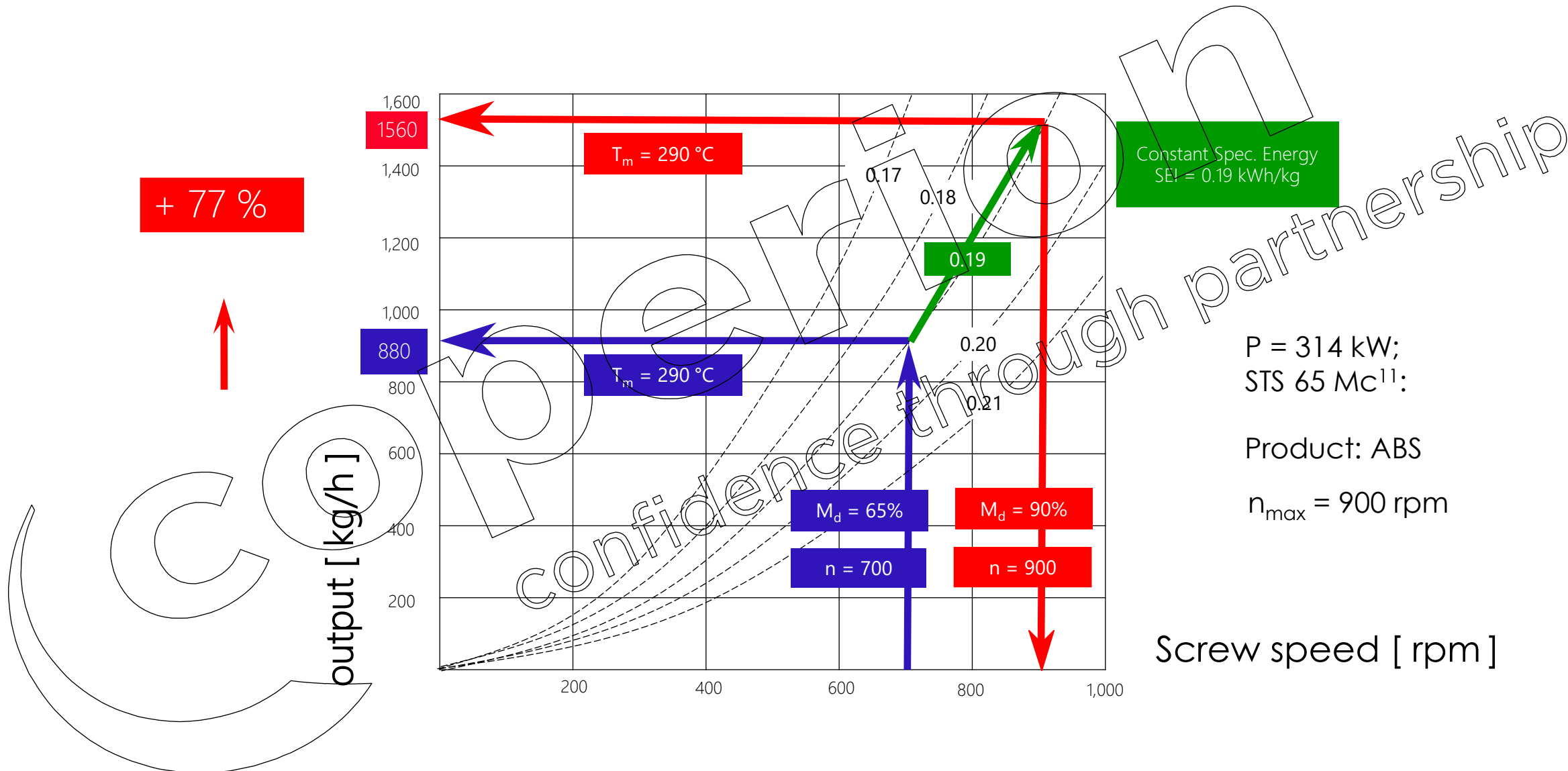
Influence of the torque level



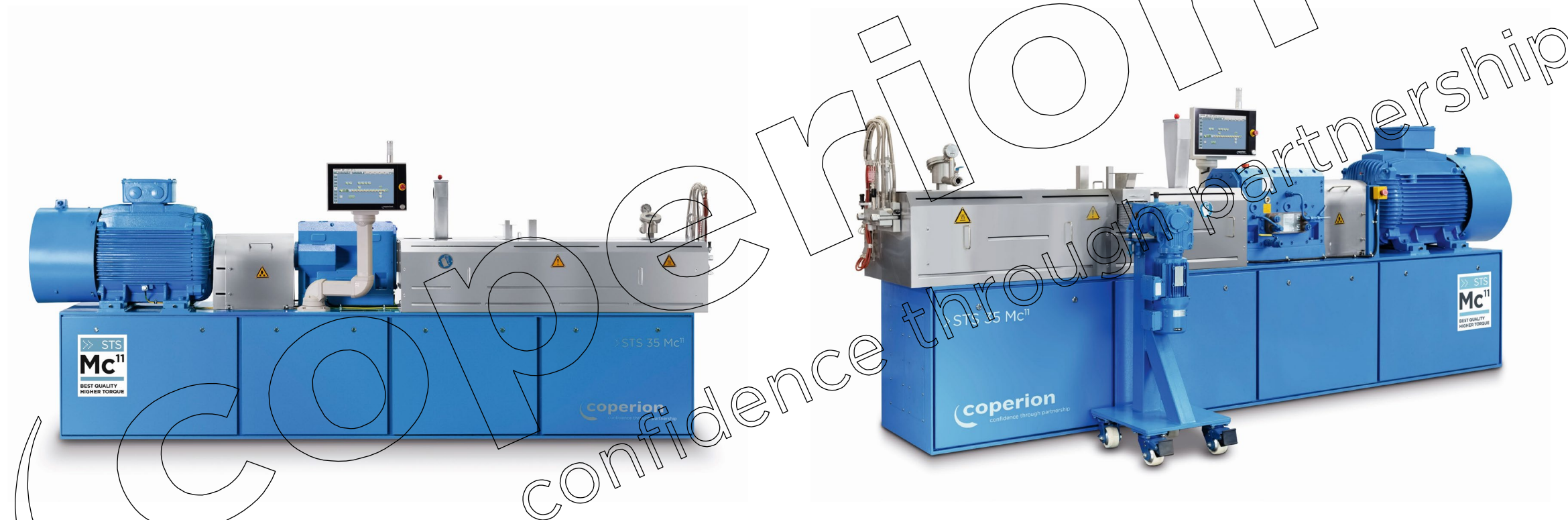
Influence of torque level with melt temperature and throughput



Influence of torque and SEI



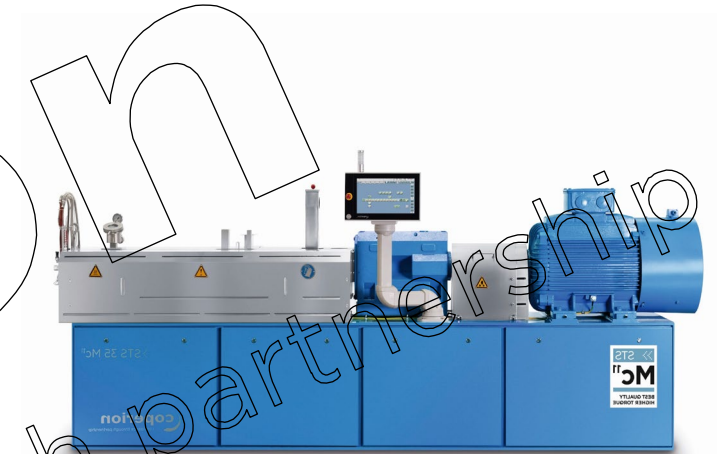
STS 35 Mc¹¹ with Masterbatch Features



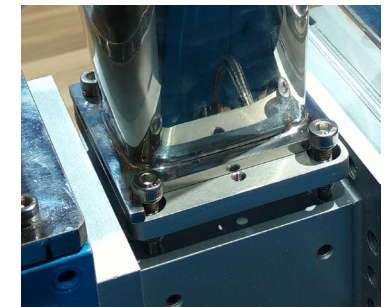
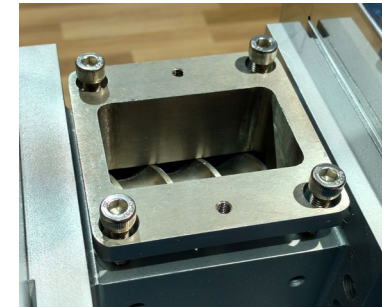
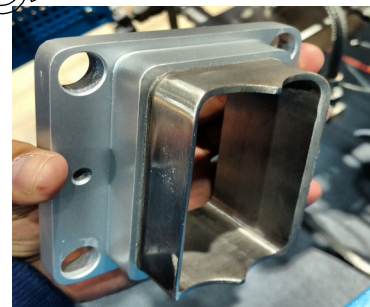
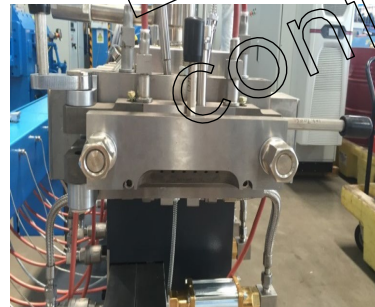
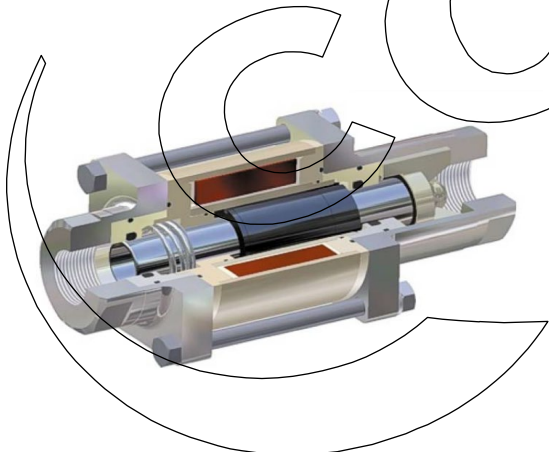
Special designs for masterbatch application (easy cleaning features)
Developed in 2018

STS Mc¹¹ Masterbatch Features

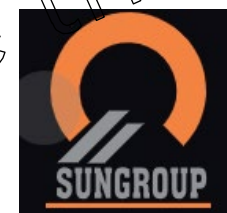
- Improved insulation hoods for easy cleaning and handling
- “Close the gap” collars around vent ports
- Easy cleaning feed hoppers and insert
- Masterbatch die heads for optimal flow and easy cleaning (STS 35 to 65)
- Coaxial solenoid valves for best reliability



**EASY CLEANING
DESIGN**



STS Reference Customers for Masterbatch



STS 25 Mc¹¹ Lab Line

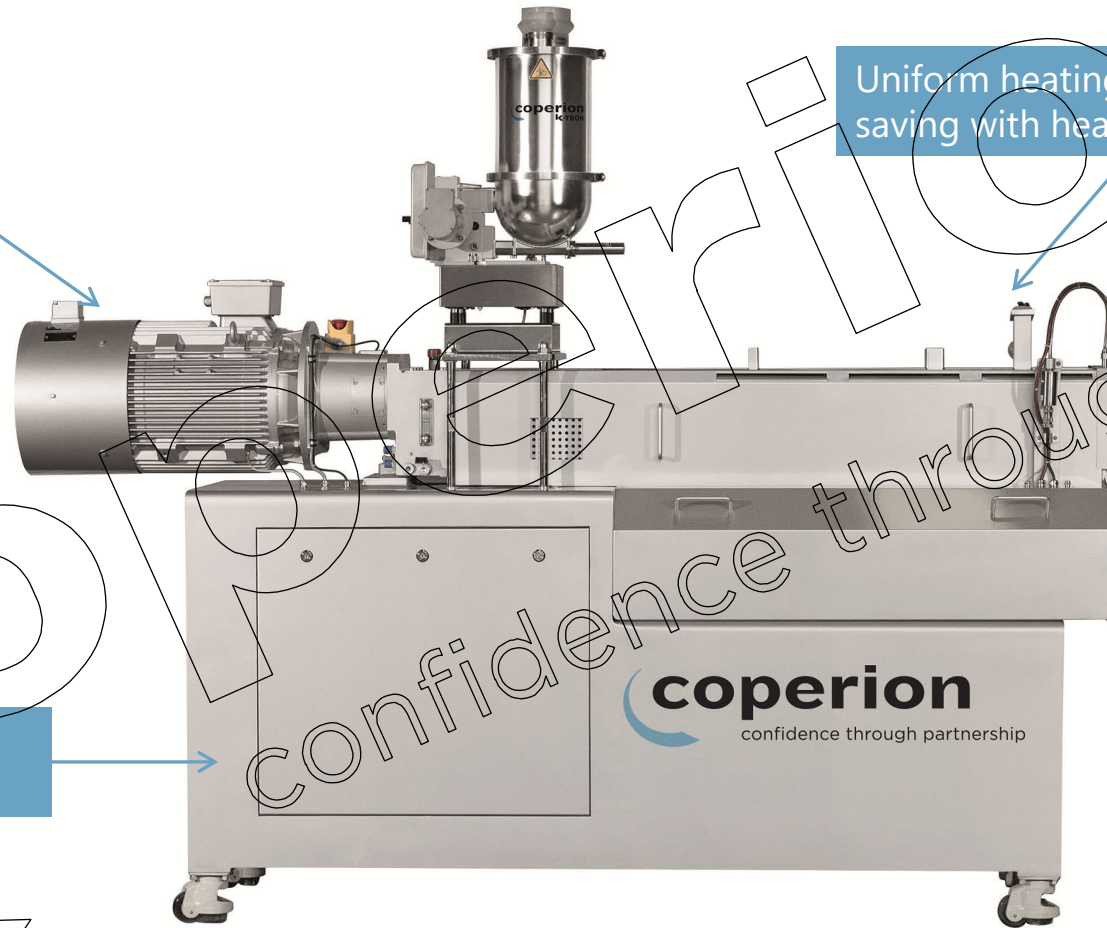
Easy scale up due to
constant Do/Di = 1.55

Uniform heating and energy
saving with heater cartridge

Increased flexibility
and time saving barrel
changes with the tie
rod design

Complete base enclosure to
ensure easy cleaning

Small space requirement
and movable wherever
needed

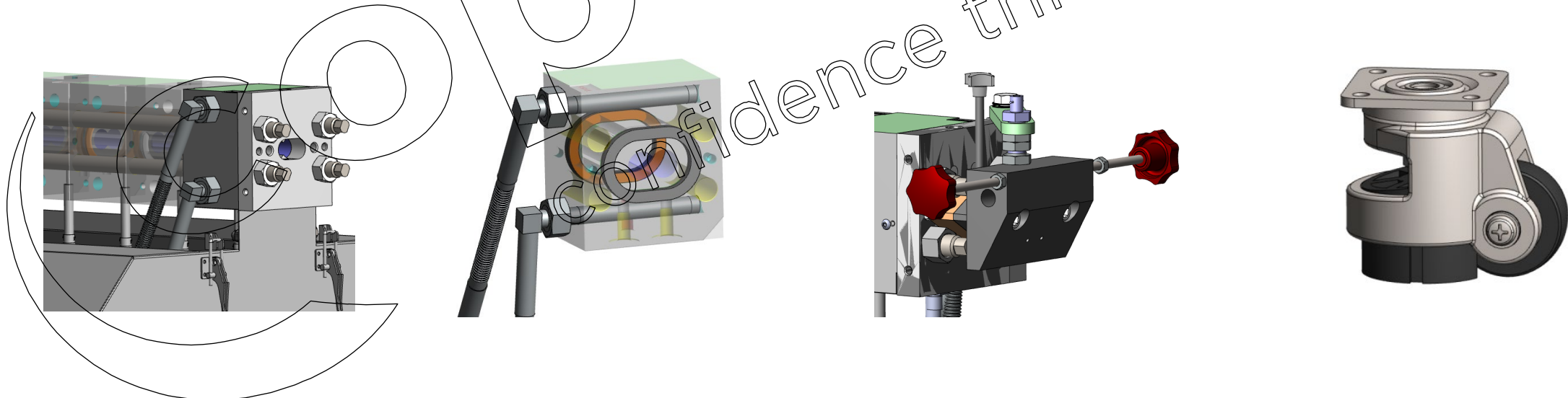


STS 25 Mc¹¹ Highlights

- Fully engineered in Coperion Germany
- Production of small quantity, as low as 2 kg for R&D and recipe developments with minimum material loss when recipe change
- Increased availability and profitability due to quick change over
- Output up to 80 kg/h, suitable for representative sampling and small production orders
- Precise scale up due to constant $Do/Di = 1.55$ within STS family
- Element flight depth of 4.55 mm enables good pellet feeding performance
- Strict CE conformity

STS 25 Mc¹¹ Highlights

- Increased flexibility and time saving for barrel exchange with tie rod design
- Heater cartridges for barrel and die head ensure uniform heating and energy saving
- Easy cleaning and user friendly features for the design of base frame, die head
- Small space requirement and movable wherever needed
- Process design flexibility with exchangeable 4D barrels and wide selection of standard screw elements



Summary

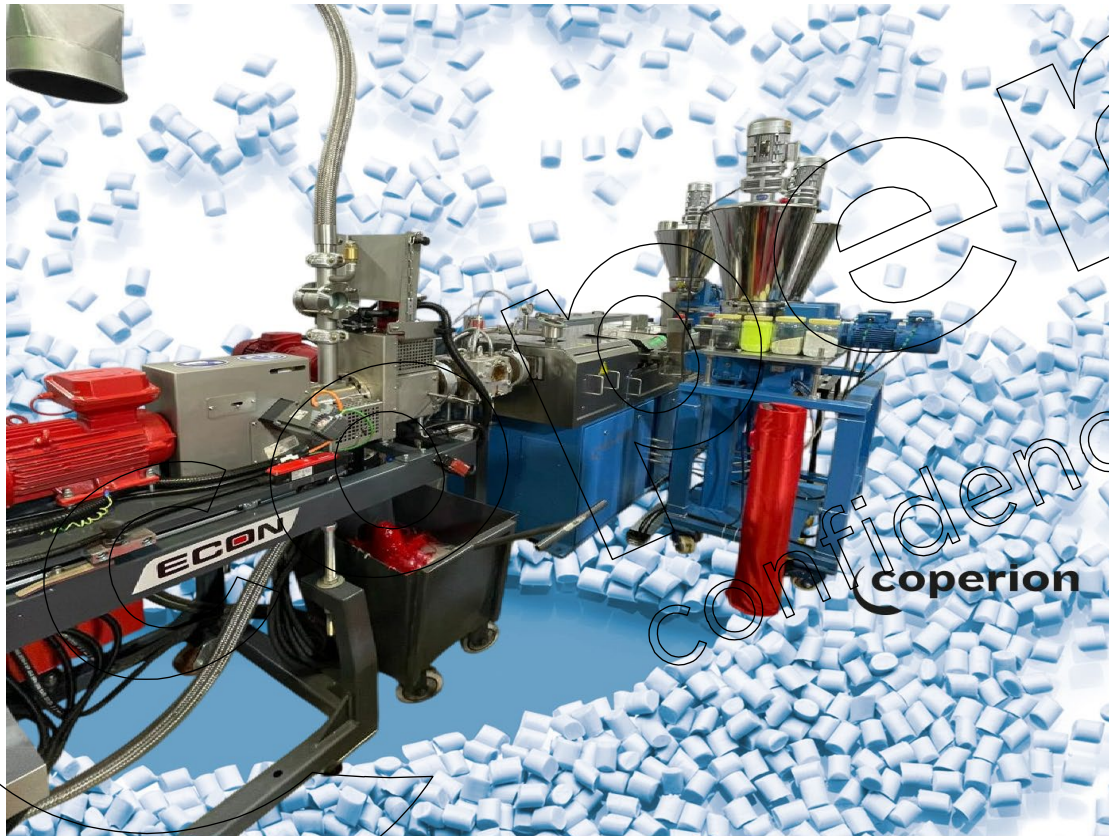
- STS is a proven product with 20 years of history and more than 1400 sets installed worldwide.
- All key components are manufactured in house according to Coperion quality standard.
- STS has a very good price and performance ratio.
- Typical applications of STS are engineering plastics, masterbatches, etc.
- STS incorporates the full process and quality know-how of Coperion to offer good product quality and machine reliability to our customers.

Test Center

With ECON India



Installed & ready to tests your recipes



- STS 35 Mc11, extruder, 900 rpm
- Process section L/D 48
- Side feeders – 2 nos.
- Volumetric feeder – 3 nos or
- Coperion K-Tron ProRate Plus LIW feeder – 3 nos.



Contact

Thank you
very much for
your attention.

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