


**Servo presses:
Efficient force-displacement
monitoring and process
control**

The Presentation will start soon

Louis Remyse– Kistler Instrument Corp

Booth 621





Servo presses: Efficient force-displacement monitoring and process control

Louis Remyse

Field Sales Engineer

Business Unit Joining Systems & Advanced Manufacturing



Louis Remyse
Field Sales Engineer
Business Unit Joining Systems & Advanced
Manufacturing

Background

Louis Remyse has been working with Kistler for almost 2 years. During his time with the company, he has represented the Joining Systems and Advanced Manufacturing Business Units. He has amassed tremendous application knowledge in variety of assembly & testing applications in different industries specifically in physical property measurement (Force, Torque, Pressure) as well as process control and monitoring.



What is Quality?

How do you get from the Left to the Right



Challenges of companies face- Where do servo presses fit?

Accept and master the challenge



Total Cost of Ownership

- Less maintenance
- Quality assurance
- Reduction of energy consumption



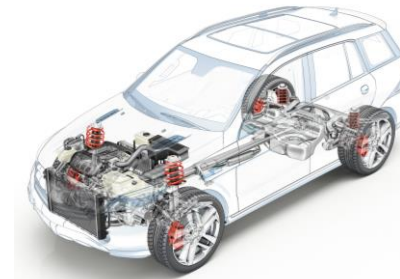
Non-Conforming parts

- Process optimization
- Control the controllables
- Effective feedback



Carbon Footprint

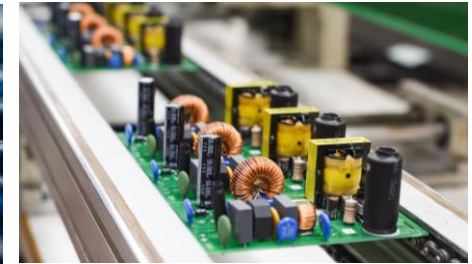
- You play a valuable part in climate protection
- Reduce your footprint



Automotive industry and TIER-suppliers



Medical industry



3C Market



White goods



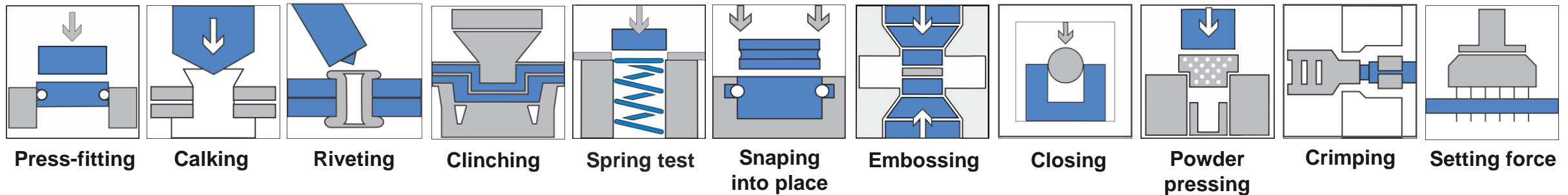
Power tools

Your application – our challenge

Do you have a new project or application?
Are you looking to maximize the potential of your system?
Do you need partners to help you determine best practice?



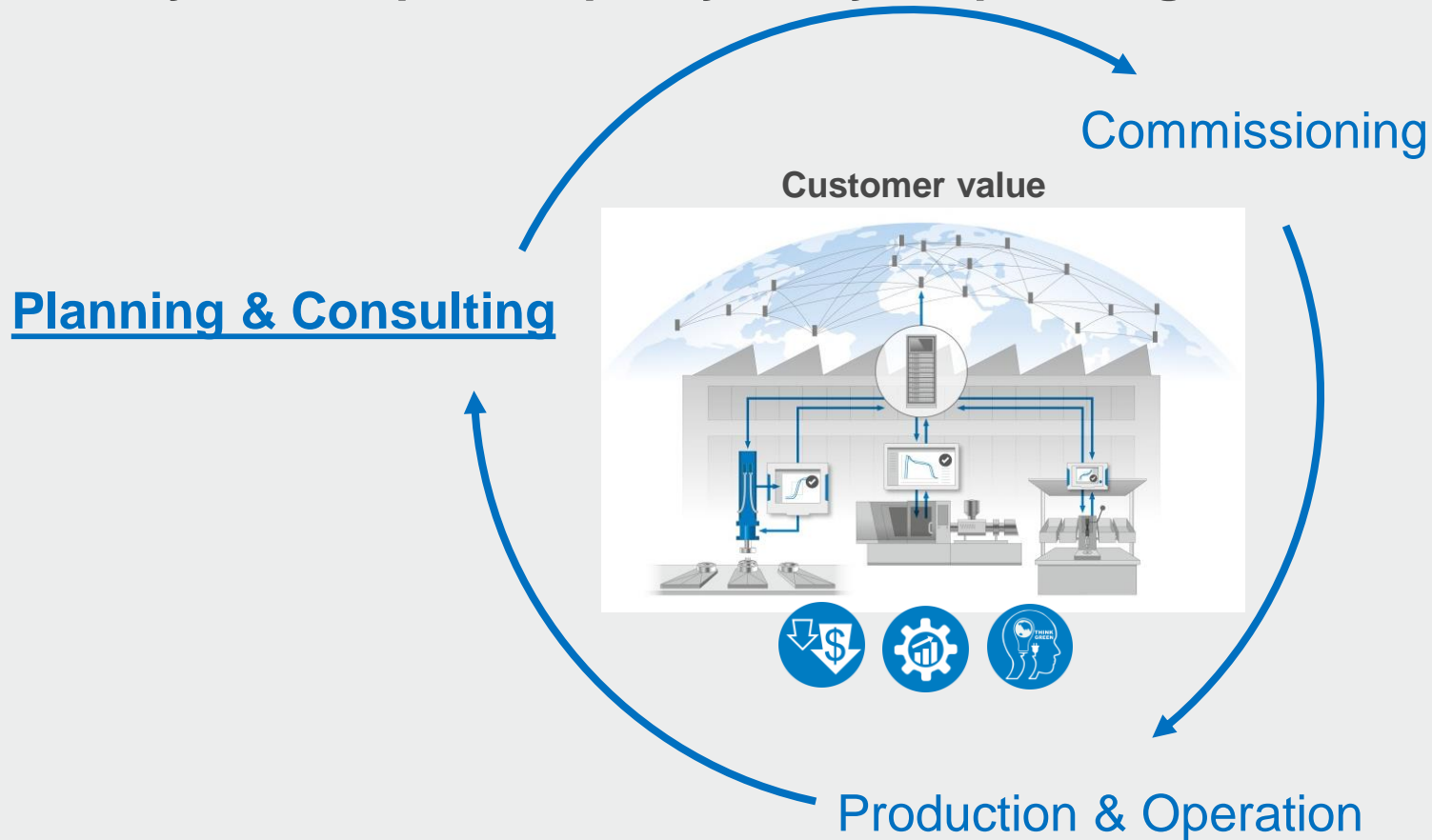
We can support you with our expertise!



There is help every step of the way with Kistler

We will support your needs in any phase of your project

How do you incorporate quality into your planning?



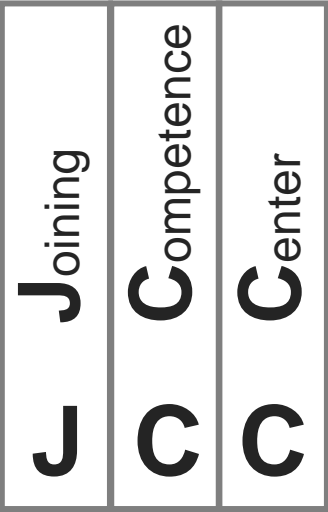
**Benefit of
our
experience**

Planning and Consulting phase

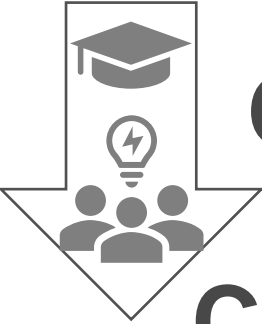
JCC will support you to find the best solution



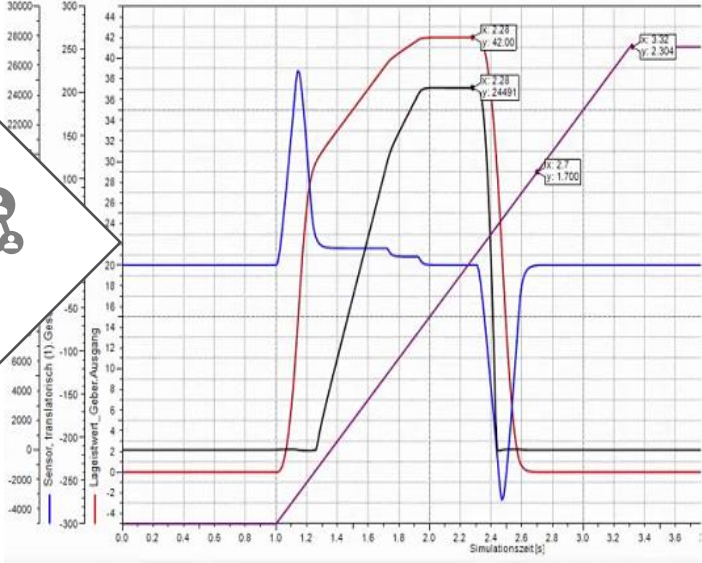
Joining



Competence



Center



Make your life easier from the start of the project – learn with the JCC

Take aways – Build quality in at the beginning



A team of consultants to help determine best practice through real life testing



Virtual simulations with realistic process parameters used to determine lifespan of equipment with official reports

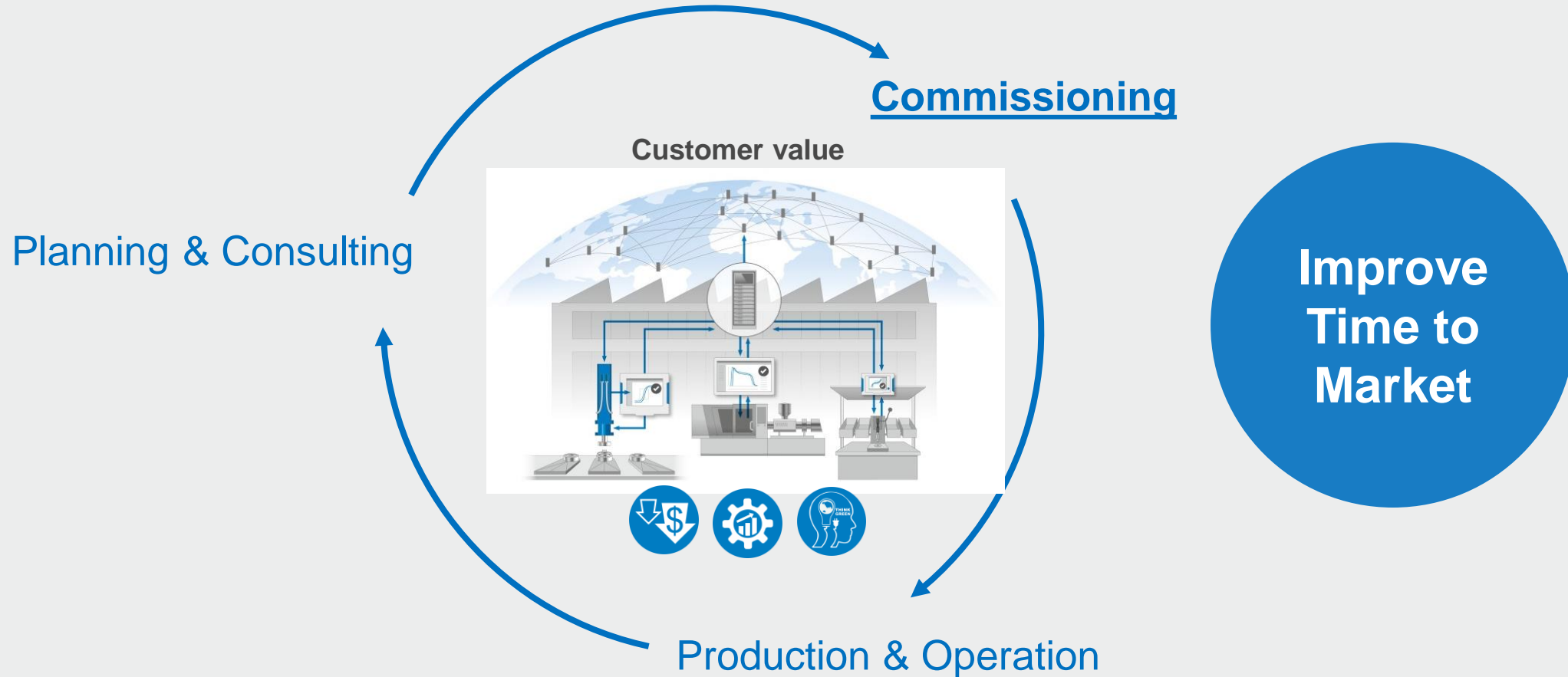


Investing your time in the beginning with Kistler will help you in the long run

There is help every step of the way with Kistler

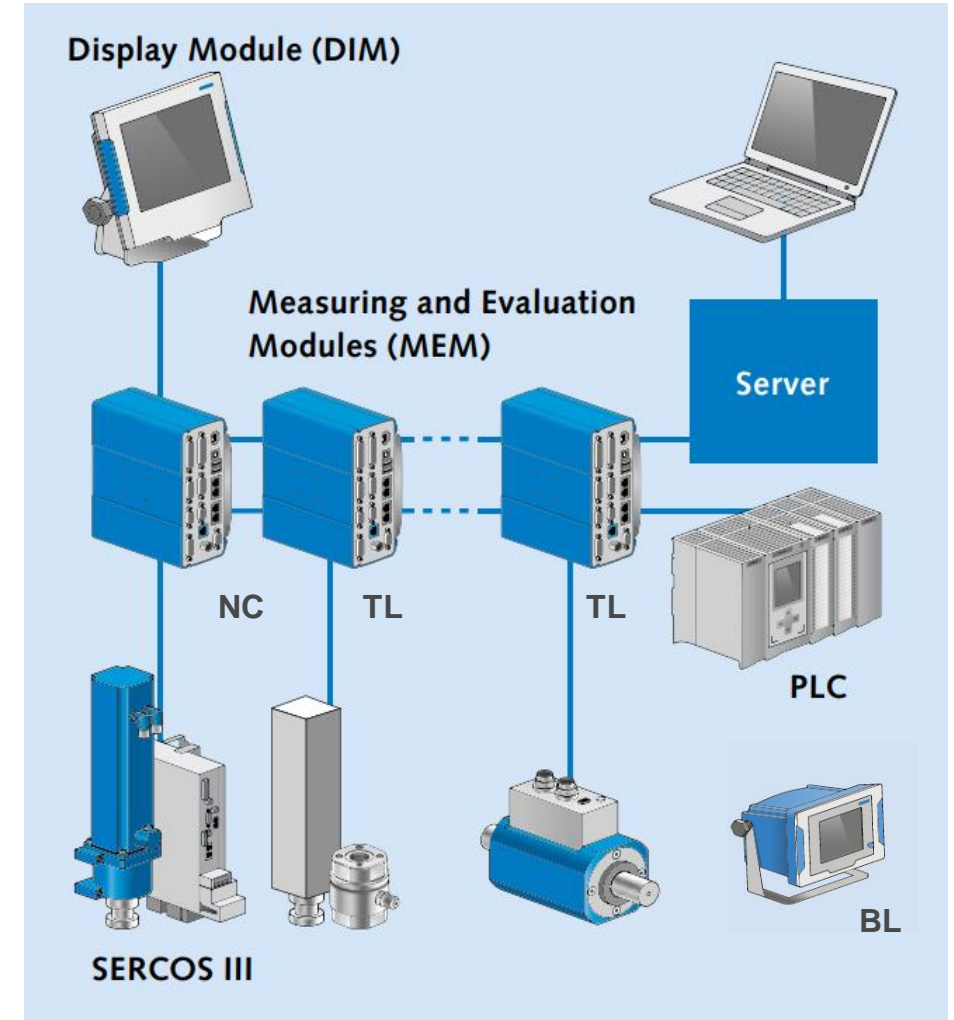
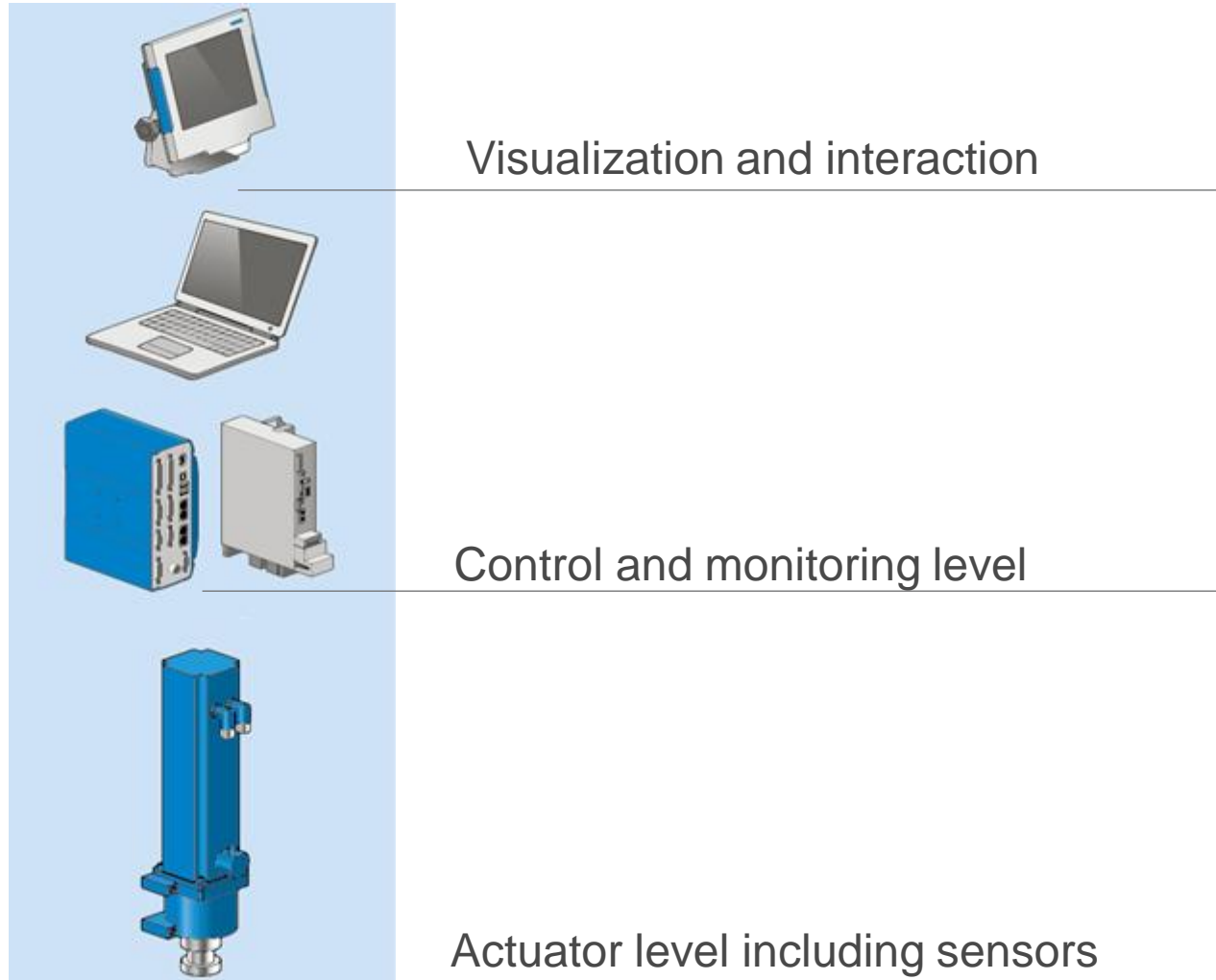
We will support your needs in any phase of your project

How do you incorporate quality into system commissioning?



One family maXYmos NC / TL / BL

Consistent throughout all systems – thanks to a uniform operating philosophy

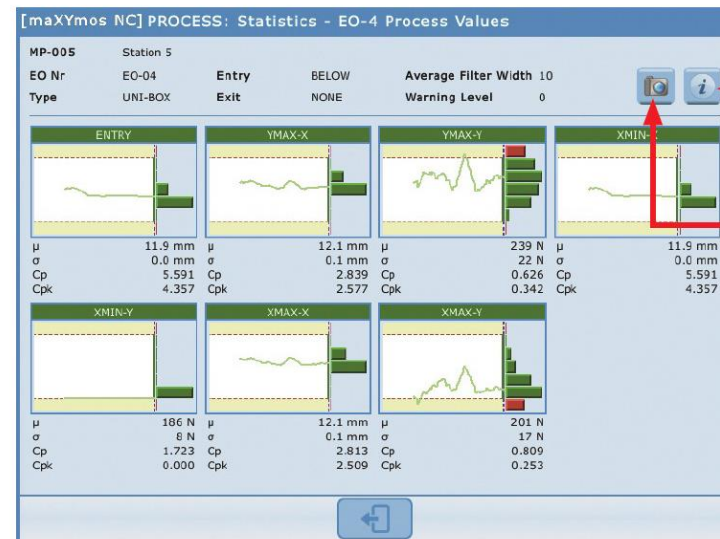


Process Monitoring & control with System Technology.

maXYmos NC

maXYmos NC controls, evaluates and documents XY curves for joining and press-fit processes, together with NC joining modules and the IndraDrive servo amplifier that is included in the system.

- 128 independent programs with up to 10 evaluation objects (EO)
- Storage for 5000 curves internally
- Uniform operating philosophy
- Integrated sequence control for maximum flexibility
- Statistics on board

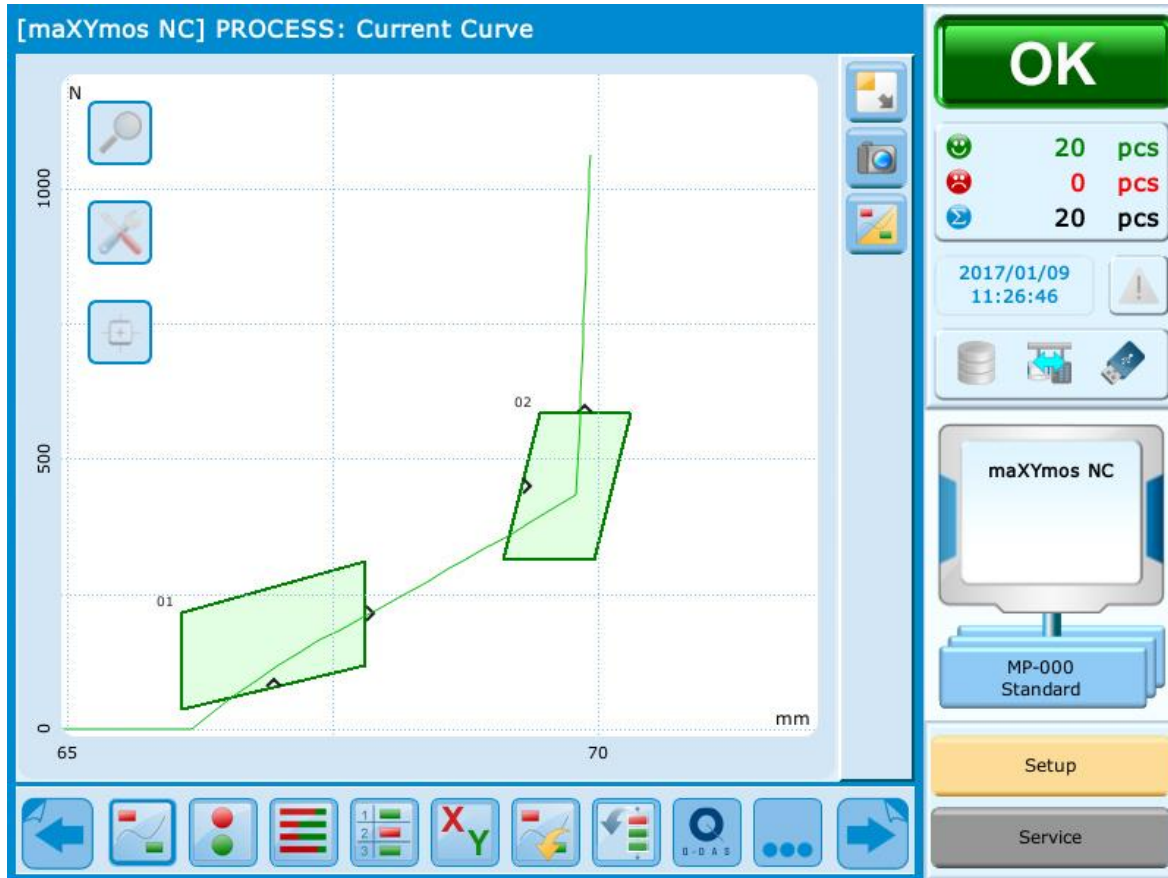


Display/Edit stored information

Create screenshot

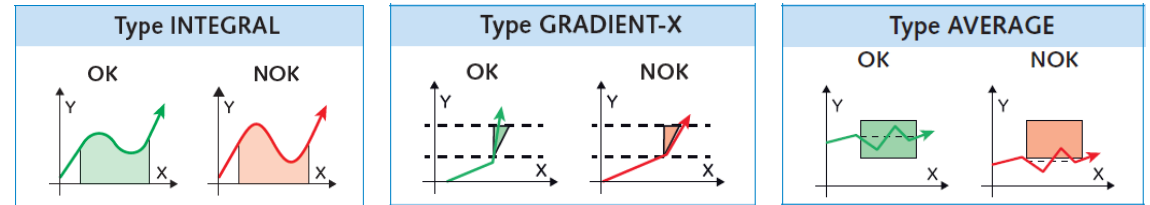
maXYmos NC- Intuitive

Powerful evaluation - more than 25 different Evaluation Object types



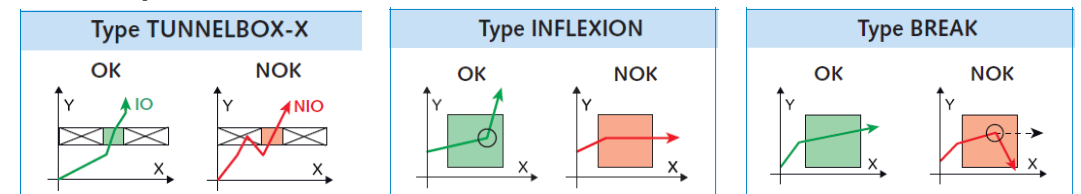
- High-performance evaluation functions like **INTEGRAL, GRADIENT, AVERAGE**

Example:



- EOs with **Live Evaluation** for more process control **TUNNELBOX, INFLEXION, BREAK, NO-PASS**

Example:



EOs: Curve evaluation with NO-PASS, LINE-X, LINE-Y, UNI-BOX, ENVELOPE, GET-REF, CALC, GRADIENT-Y, GRADIENT-X, HYSTERESIS-Y, HYSTERESIS-X, TUNNELBOX-X, TUNNELBOX-Y, SPEED, AVERAGE, BREAK, INFLEXION, INTEGRAL, DIG-IN, DELTA-Y, TRAPEZOID-X, TRAPEZOID-Y, TIME, DISPLACEMENT RANGE, FORCE RANGE, PASS-THROUGH BOX

What do you gain during commissioning

Take aways - How did you incorporate quality into system commissioning?



Testing is done before the delivery, so you spend less time setting the system up



An intuitive system that enables you to get up to speed fast and begin your XY monitoring

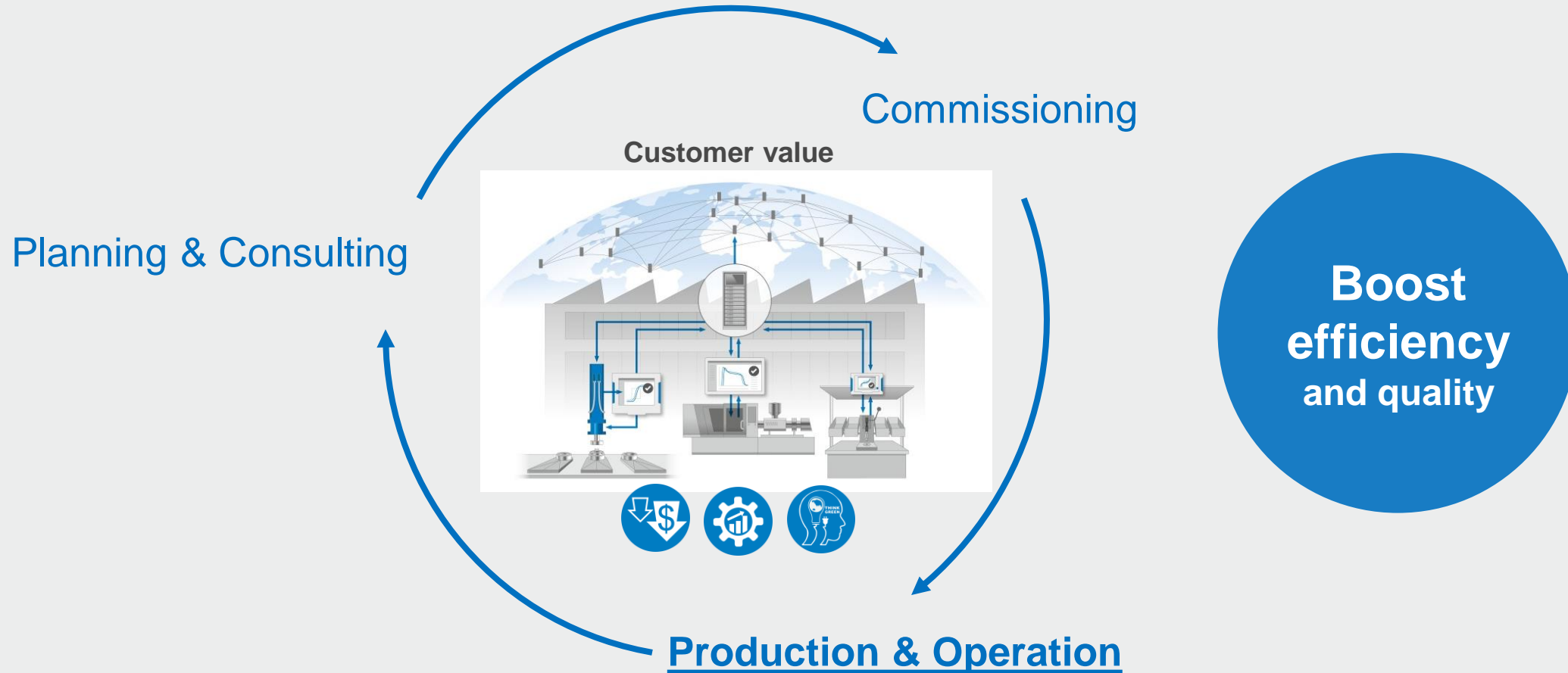


World class production monitoring and control features

All-round carefree package of Kistler

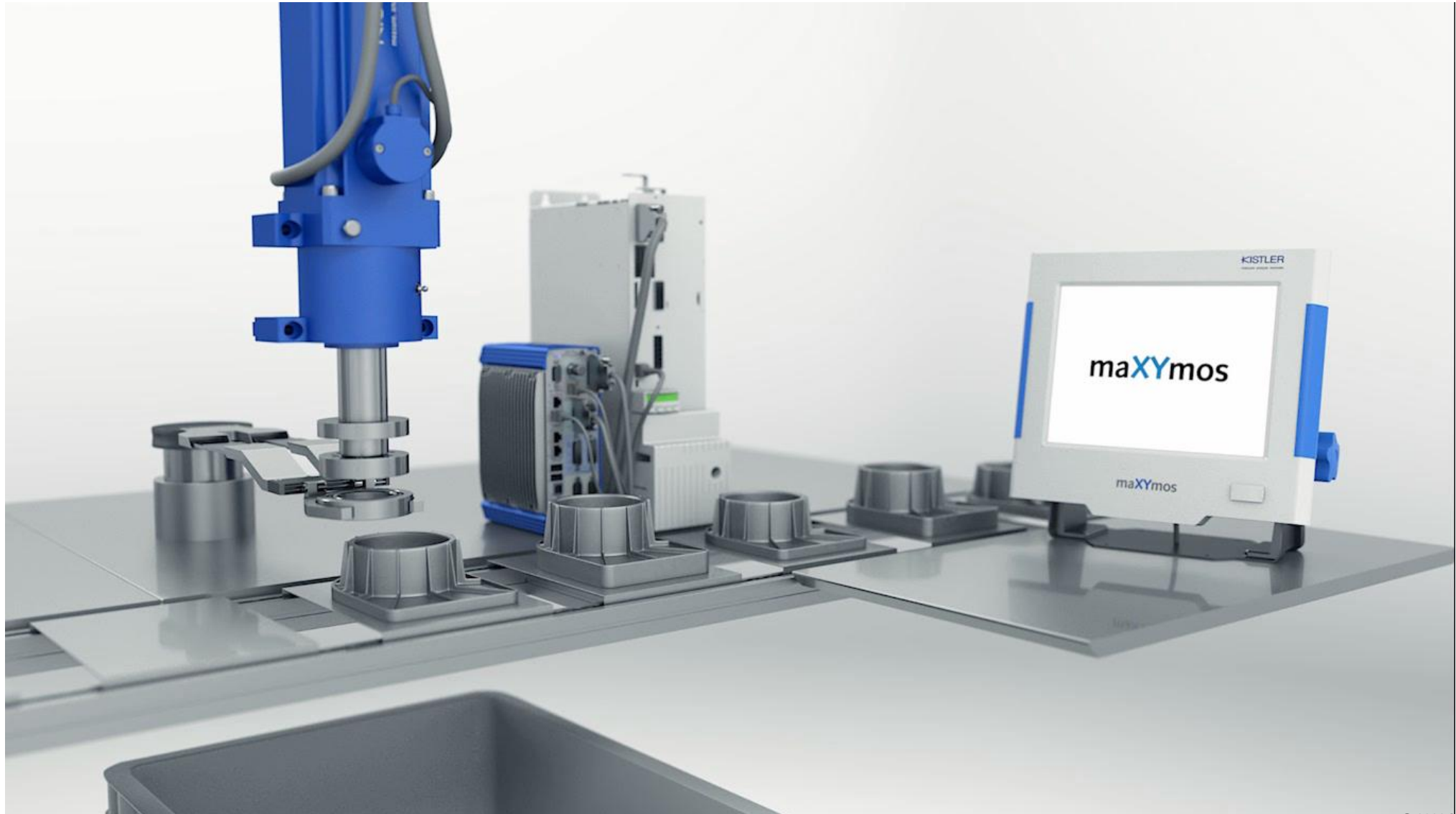
Kistler supports you in any phase of your project

How did you incorporate quality into production and operations?



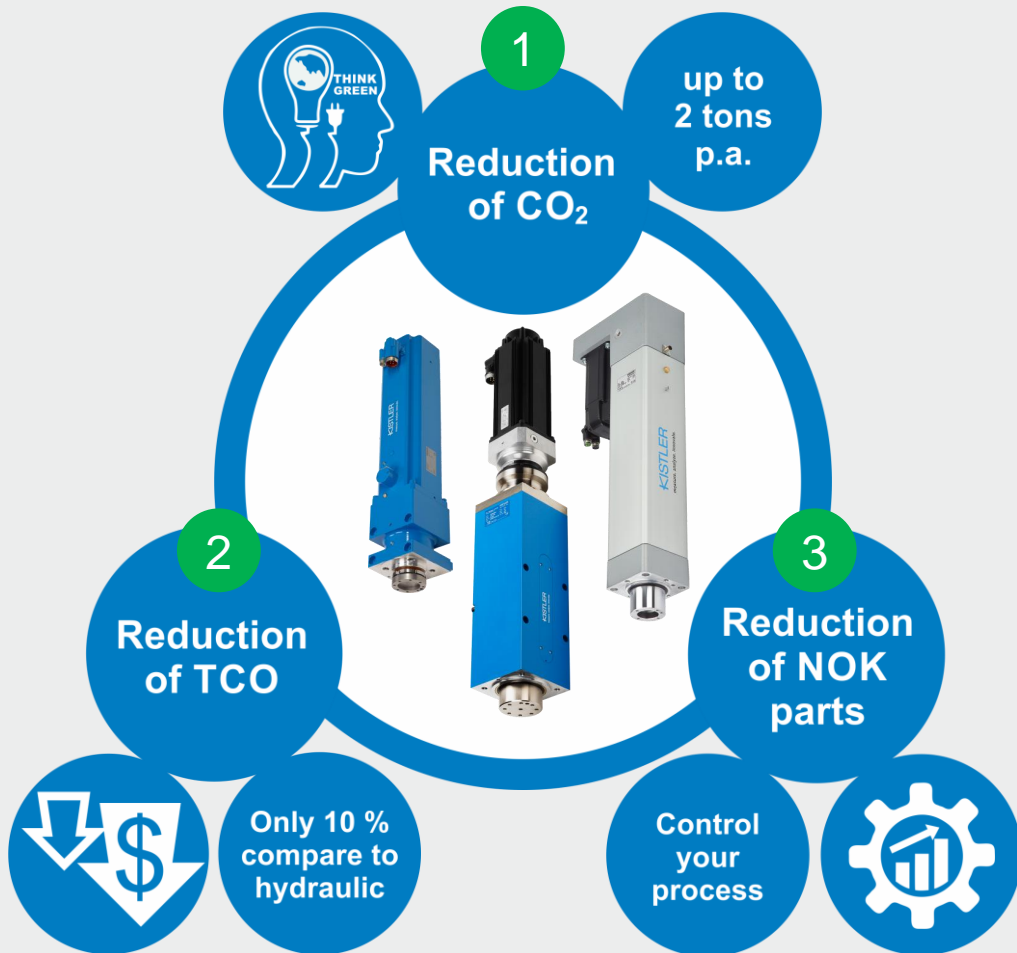
Production & Operation of a NC joining system / servo press

Transparency: The basis for efficient processes



3R-CTN

How does this fit into Quality?



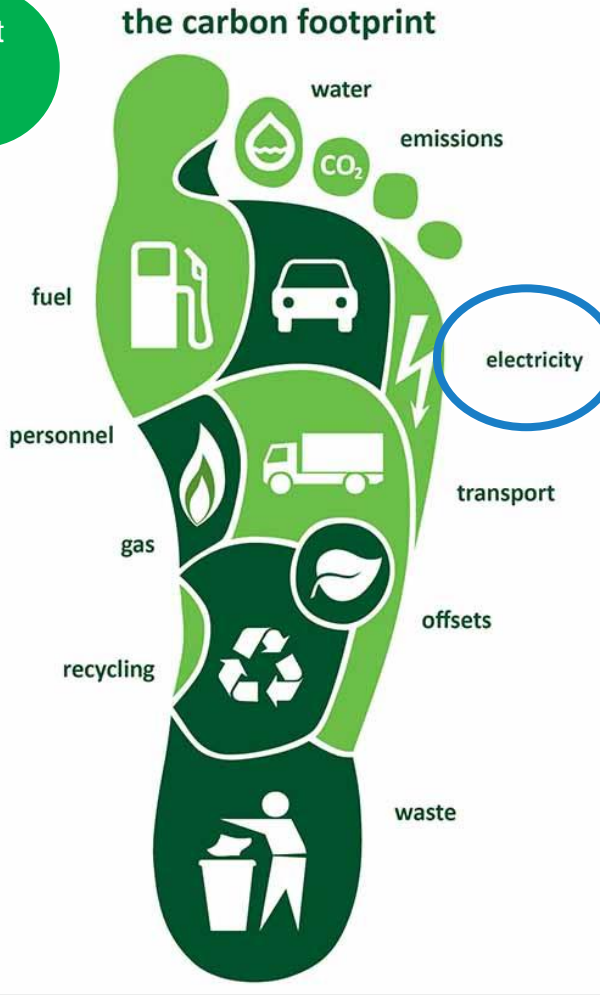
Kistler 3R-CTN

- 1 Reduction of **C**arbon footprint (CO₂)
Each elect. JS save approx. 2 000 kg CO₂ per year
- 2 Reduction of **T**CO (Total Cost of Ownership)
Only “10 %” compare to hydraulic
- 3 Reduction of **N**OK parts because with elect. JS you not only monitor but are controlling the process too
Reduction of NOK parts e.g. from 1 % to 0.2 %

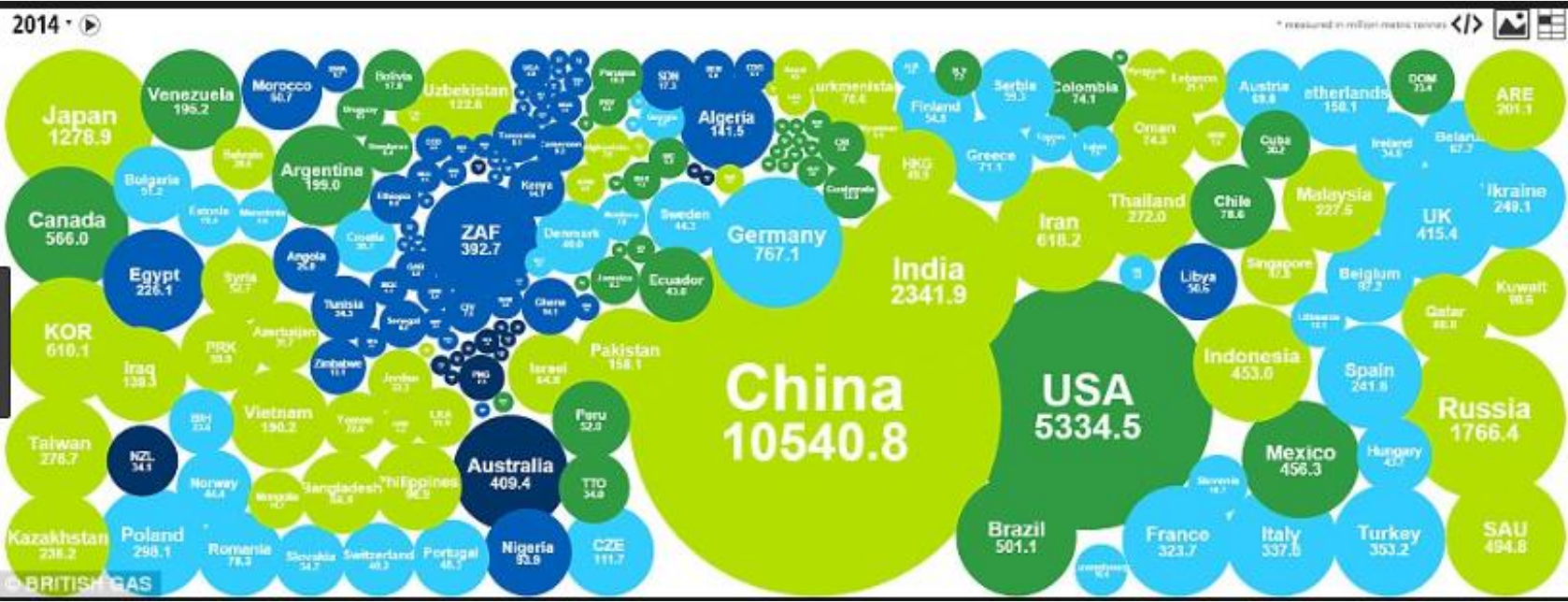
1st R - Reduction of carbon footprint

Carbon footprint consists of

1st
R



1st R - Reduction of Carbon footprint



2nd R - Reduction of TCO

Costs reduction

Cost Blocks:

- Energy Costs
- Maintenance Costs
- Material Costs
- Space Costs
- Other Costs
- Free program to help determine cost savings

KISTLER measure. analyze. innovate.	Pneumatic ≤ 30 kN Joining System		Pneumohydraulic Joining System		Electromechanical NC Joining System (ServoPress)		Hydraulik Joining System	
Approximatly cost per year								
Nominal Joining force or rather Kistler model	30	kN	30	kN	30	kN	30	kN
Number of cylinders / NC joining systems	1		1		1		1	
Standard values air consuption per stroke / energy consumption	136,00	liter	38,00	liter	0,375	kW	4,76	kW
ustomer's estimated air consumption per stroke / energy consumption	0,00	liter	0,00	liter	0,00	kW	0,00	kW
Price per 1000 normal liter (Nm ³) air at 6 bar / per kWh	0,025	€	0,025	€	0,15	€	0,15	€
Cycle time for each part including pause time	15	sec.	15	sec.	15	sec.	15	sec.
Operating hours per day	16,0	h	16,0	h	16,00	h	16,0	h
Number of parts per day	3840	parts	3840	parts	3840	parts	3840	parts
Working days per year	220	days	220	days	220	days	220	days
Number of parts per year	844800	parts	844800	parts	844800	parts	844800	parts
Energy consumption in Nm ³ / kWh per year	114893	m ³	32102	m ³	1232	kWh	10748	kWh
Energy costs per year	2872	€	803	€	185	€	1612	€
Extra energy cost versus NC Joining per year	2070	€	618	€		€	1427	€
Maintenance costs per cylinder/system								
Time for maintenance per year	4,0	h	4,0	h	1,0	h	5,0	h
Personnel costs per hour	50,00	€	50,00	€	50,00	€	50,00	€
Annual cleaning costs of leakage	0,00	€	0,00	€		€	200,00	€
Maintenance costs per year	200,00	€	200,00	€	50,00	€	450,00	€
Extra maintenance cost versus NC Joining	150,00	€	150,00	€		€	400,00	€
Costs auxiliaries								
Price per normal liter (Nm ³) / Price of hydraulic oil per liter	0,025	€	0,025	€		€	4,00	€
Annual loss by leakage	5	%	5	%		liter	1,0	liter
Required amount of air losses / liters for oil change per year	5745	m ³	1605	m ³		liter	30,0	liter
Oil disposal costs per liter		€		€		€	1,00	€
Costs for grease (lubrication)		€		€	5,00	€		€
Auxiliary costs per year	144	€	40	€	5,00	€	155	€
Extra auxiliary cost versus NC Joining	139	€	35	€		€	150,00	€
Costs production area								
Additional required footprint for power pack in m ²	5,0	m ²	5,0	m ²		m ²	5,0	m ²
Monthly cost for footprint per m ²	4,00	€	4,00	€		€	4,00	€
Extra production area cost versus NC Joining	240	€	240	€		€	240	€
Other costs								
Other costs per year	0,00	€	0,00	€	0,00	€	200,00	€
Total costs per year	3456	€	1283	€	240	€	2657	€
Annual extra cost vs. NC Joining System	2.598	€	1.043	€		€	2.402	€

Example calculation of 5 pneumatic systems:
(cost depending on the application)

Energy costs (e.g.)

Pneumatic **9 677,- €**

Electromechanic **720,- €**

Savings 8 957,- 

Maintenance costs (e.g.)

Pneumatic **500,- €**

Electromechanic **250,- €**

Savings 250,- 

Total costs per year (e.g.)

Pneumatic **10 177,- €**

Electromechanic **970,- €**

Savings 9 207,- € 

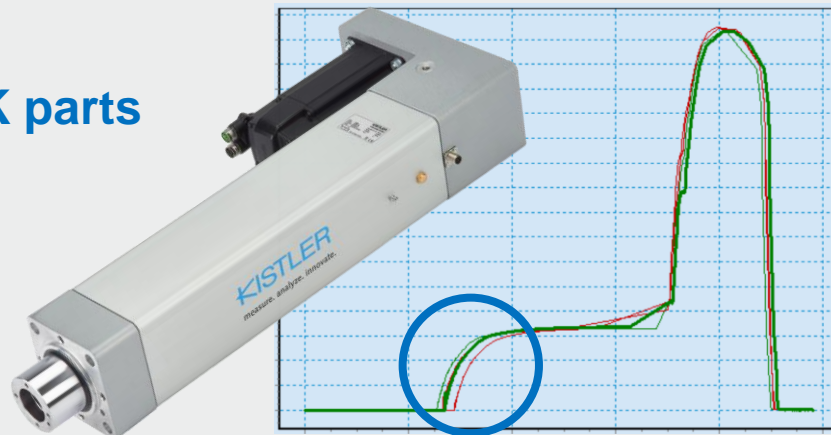
3rd R - Reduction of NOK parts

3rd R - Reduction of NOK parts

NCFE is able to control the process.

1. Able to drive different speeds
 - e.g. idle stroke with high speed 200 mm/sec / press stroke 5 mm/sec
 - Shorter cycle time regarding different speed
2. The joining process has a soft touch

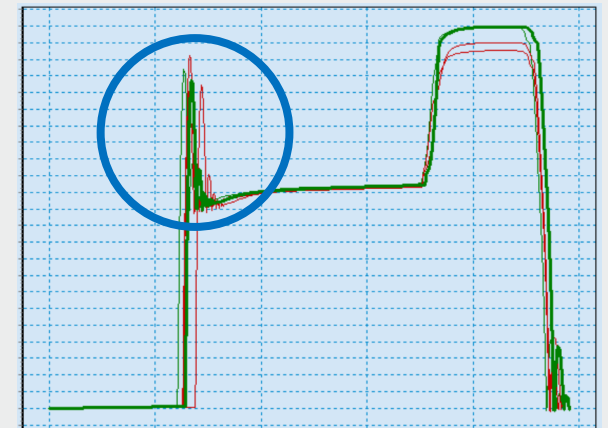
3. Less NOK parts



Powerpack, pneumatic & hydraulic systems have only the option to monitor the process.

1. “No” different speed → only “one” speed
 - Longer cycle time, because the speed of idle and press stroke is the “same”
2. Therefore they hit the part with high speed and can destroy it

3. More NOK parts



Production and Operation in modern factories

Take away- How did you incorporate quality into your production and operations?



Save time and money by going with electromechanical system and Kistler



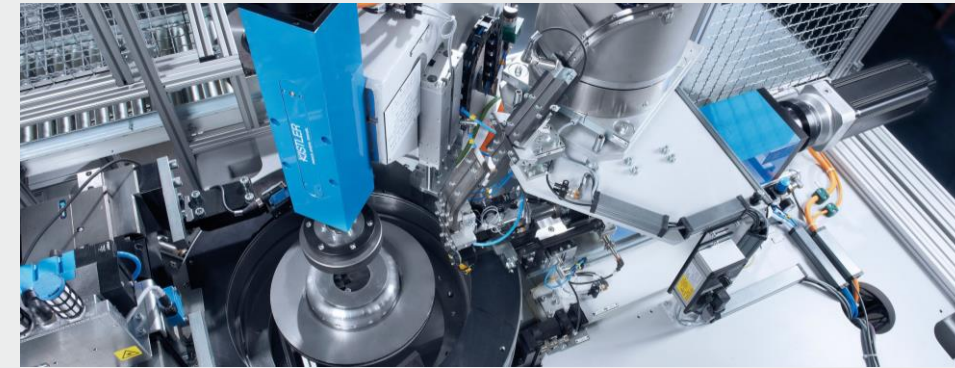
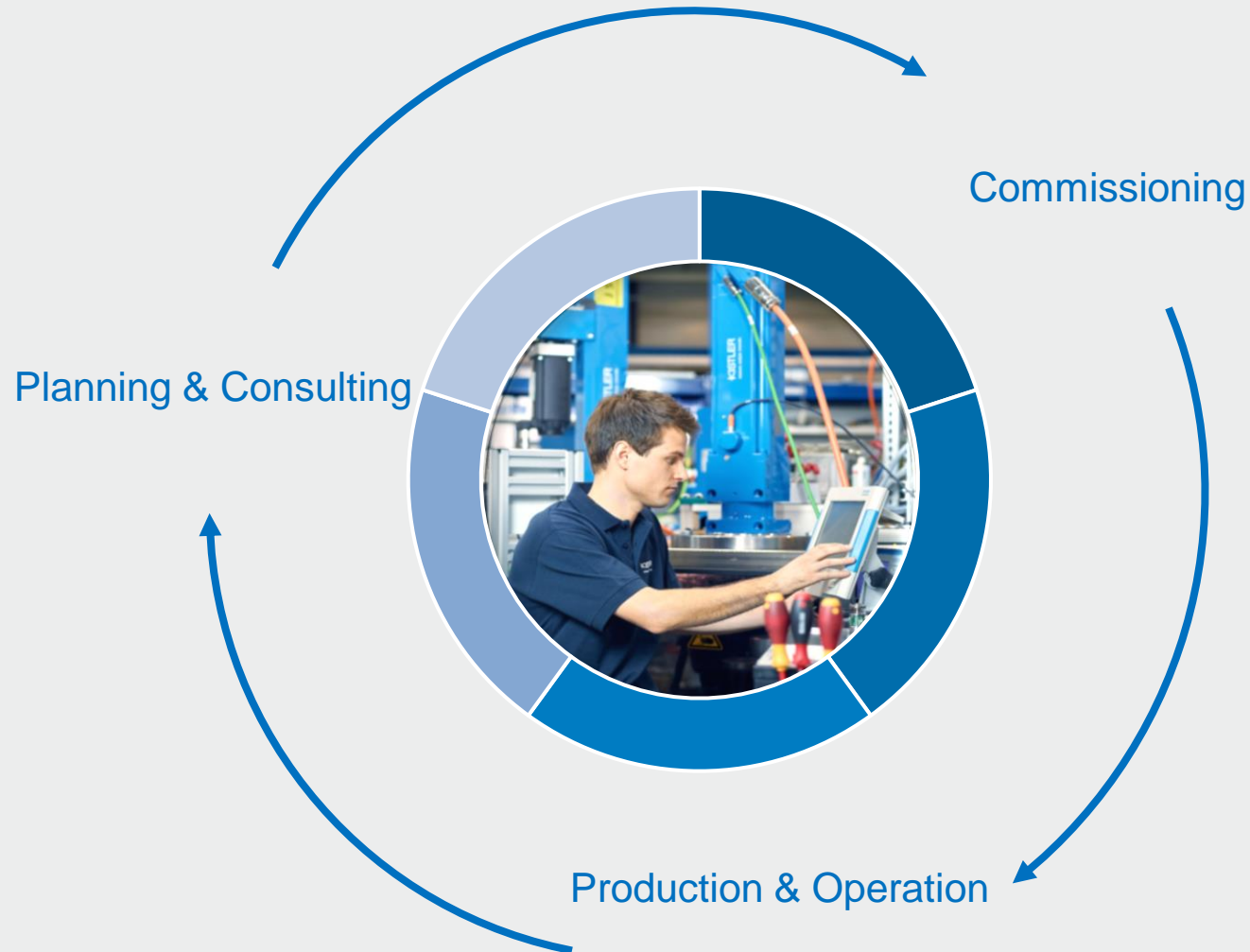
Process control improves your part quality and reduces scrap



Reducing your carbon footprint while saving on energy costs at the same time

Summary electromechanical NC joining systems

Kistler supports you in any phase of your project



Process	High	Low
	increase	reduce
Flexibility / traceability for press-fit processes	↗	
Installation efforts		↘
Maintenance and cost of ownership (TCO)		↘
Energy consumption		↘
Environmental benefit	↗	

That's the difference to have Kistler as a partner



Thank you for your attention!

Please visit us at **Booth 621** for further questions

