

The next generation of multi-component moulding

SkinForm, X-Form, CoverForm

Oslo, Norway 22 - 23.06.2010

Jochen Mitzler

Your system... is out of one hand

One supplier - KraussMaffei – Simple integration



What is SkinForm ?

A system solution from different areas of expertise

SkinForm®



Injection Moulding



PUR- Moulding



KraussMaffei
PEOPLE FOR PLASTICS

Fakuma 2005
Micro Colour Metering
SkinForm



Softtouch, scratch resistance and best optic and haptic ... SkinForm applications



One shot door panel with 4 different surface materials ...

Application sample automotive

Application:

- Door panel – K2007
- PC / ABS with 3 different PUR Skin materials

Innovation:

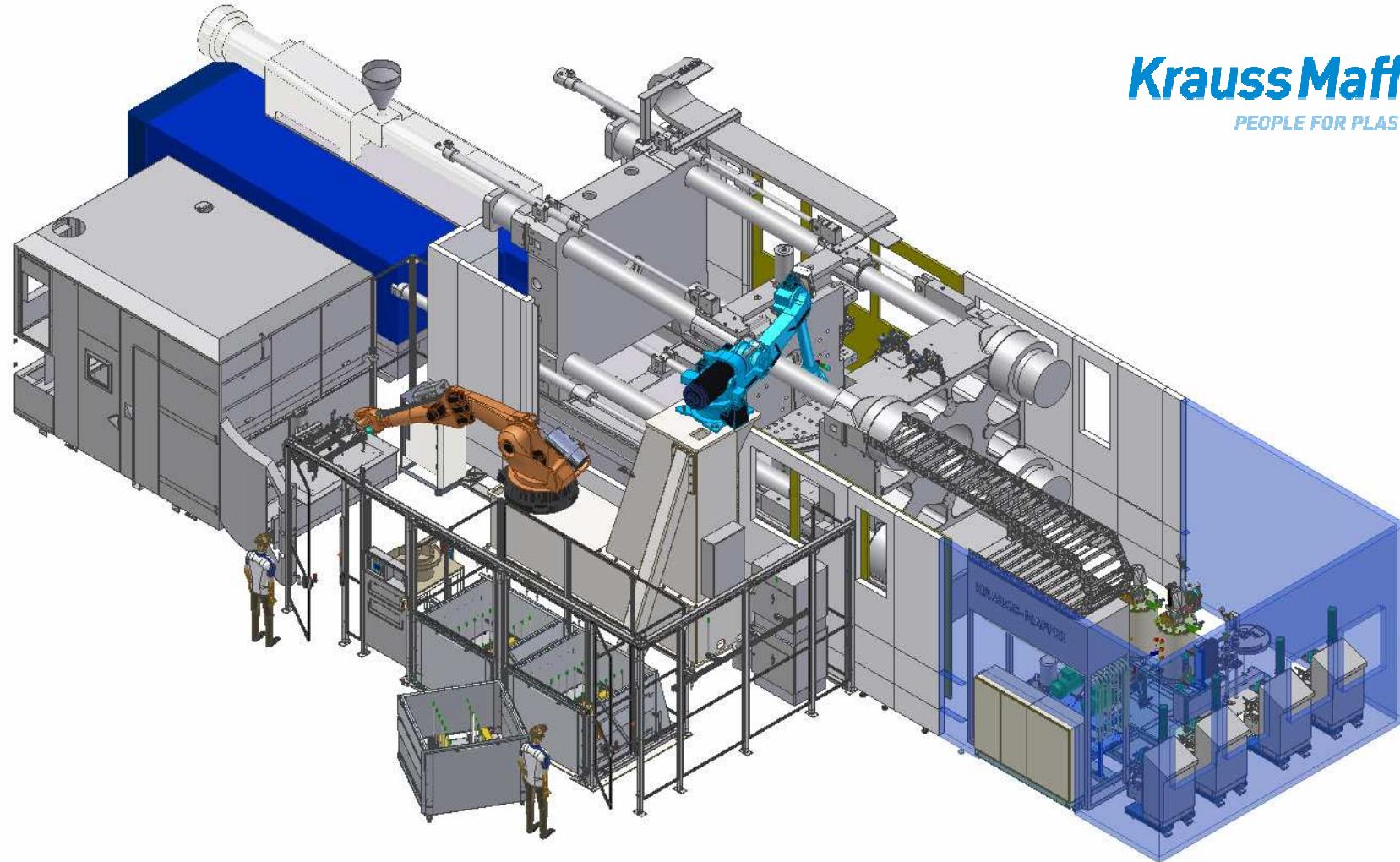
- Combination of injection moulding and PUR technology
- Part transfer with Spin-Unit
- Complex automation cell

Value:

- Part with four different surfaces
- Partial softtouch and thin overmolding
- Well directed material distribution (Skin material saving)

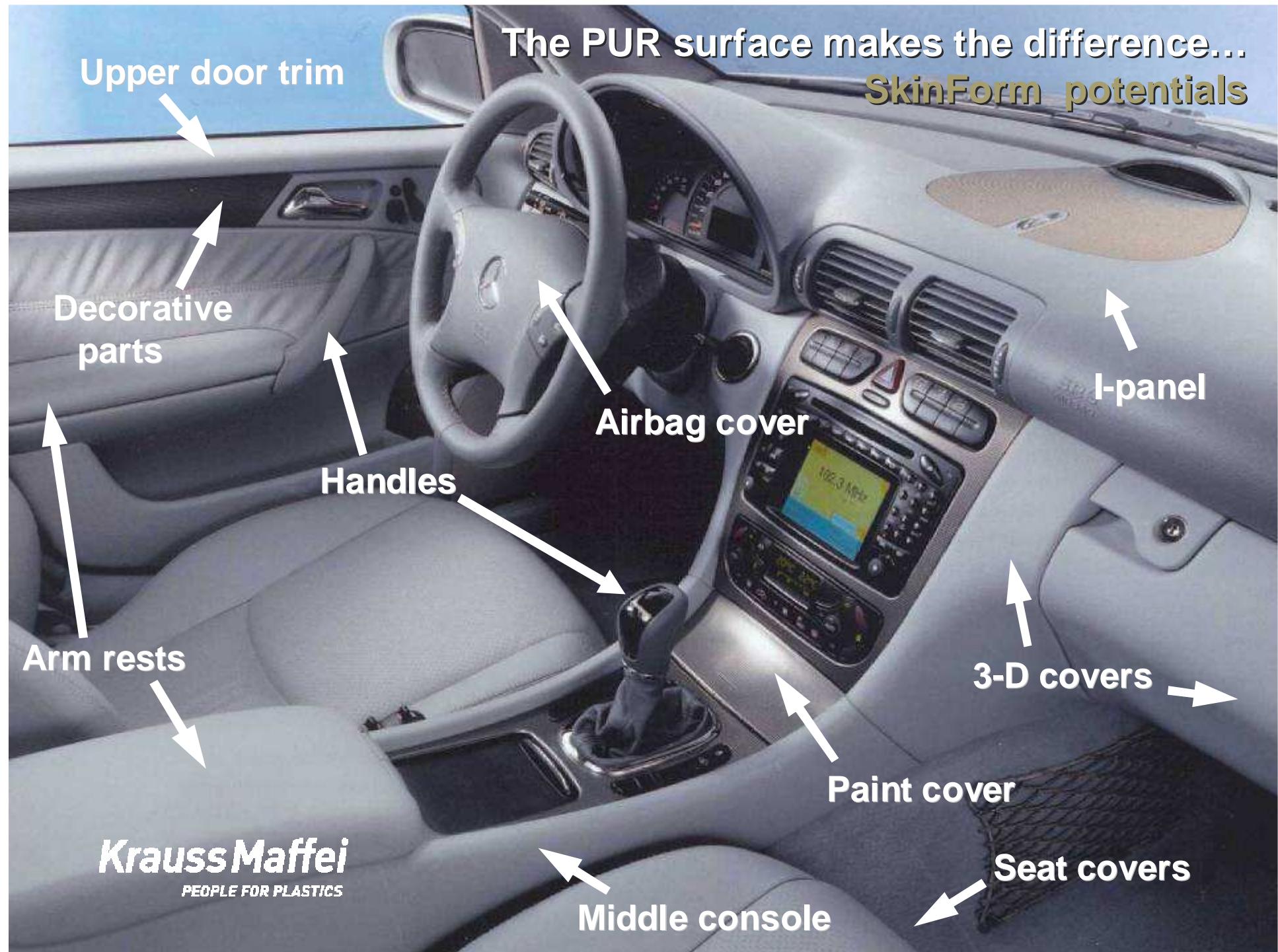


CADENCE >
INNOVATION



SkinForm - cost advantage thru one shot process

Applications for high grade surfaces, paints, flexible foam combinations, acoustic and insulating properties



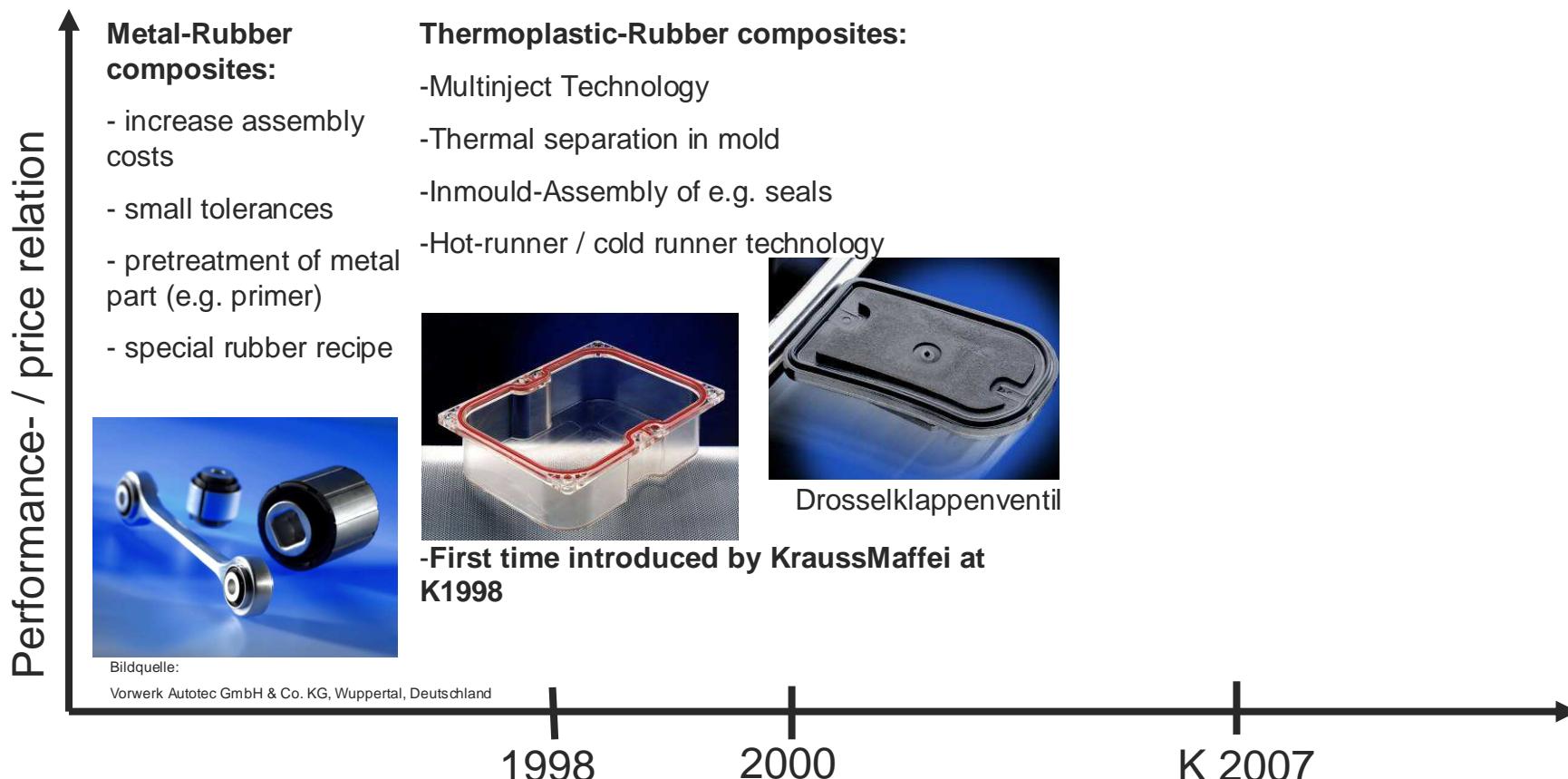
10 years of innovation and technology competences ... K-Highlights of IMC technology

K 1998	K 2001	K 2004	K 2007
<p>Armrest</p> <ul style="list-style-type: none">• PP + Talkum  	<p>Exterior part</p> <ul style="list-style-type: none">• ABS+glass fiber• Foil + cleanroom  	<p>Structural parts</p> <ul style="list-style-type: none">• PP + glass fiber  	<p>Vibration damping element</p> <ul style="list-style-type: none">• TPU-X• All in one  

History of IMC (Injection Molding Compounder)

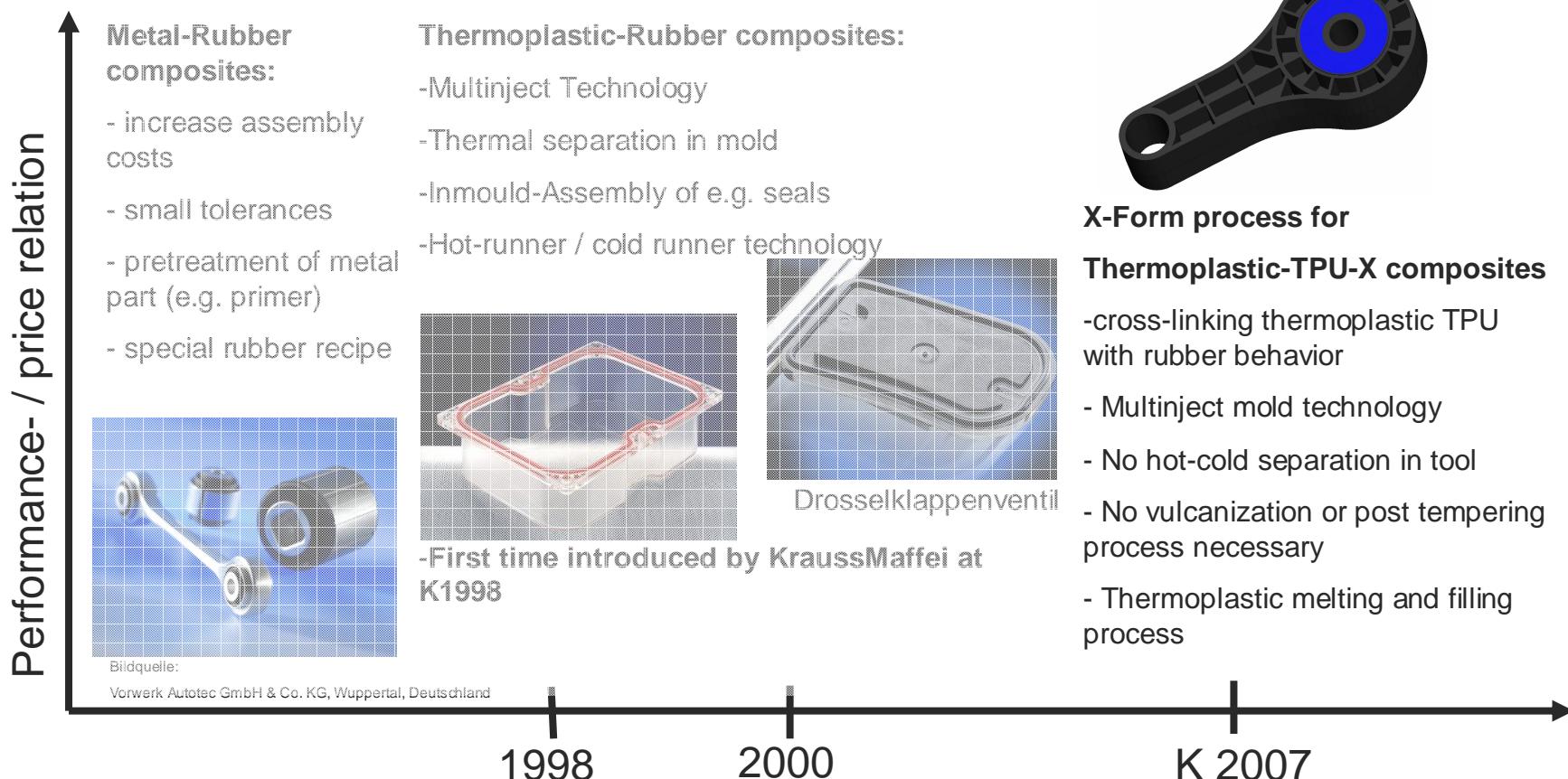
X-Form process for new hard-soft parts

Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X



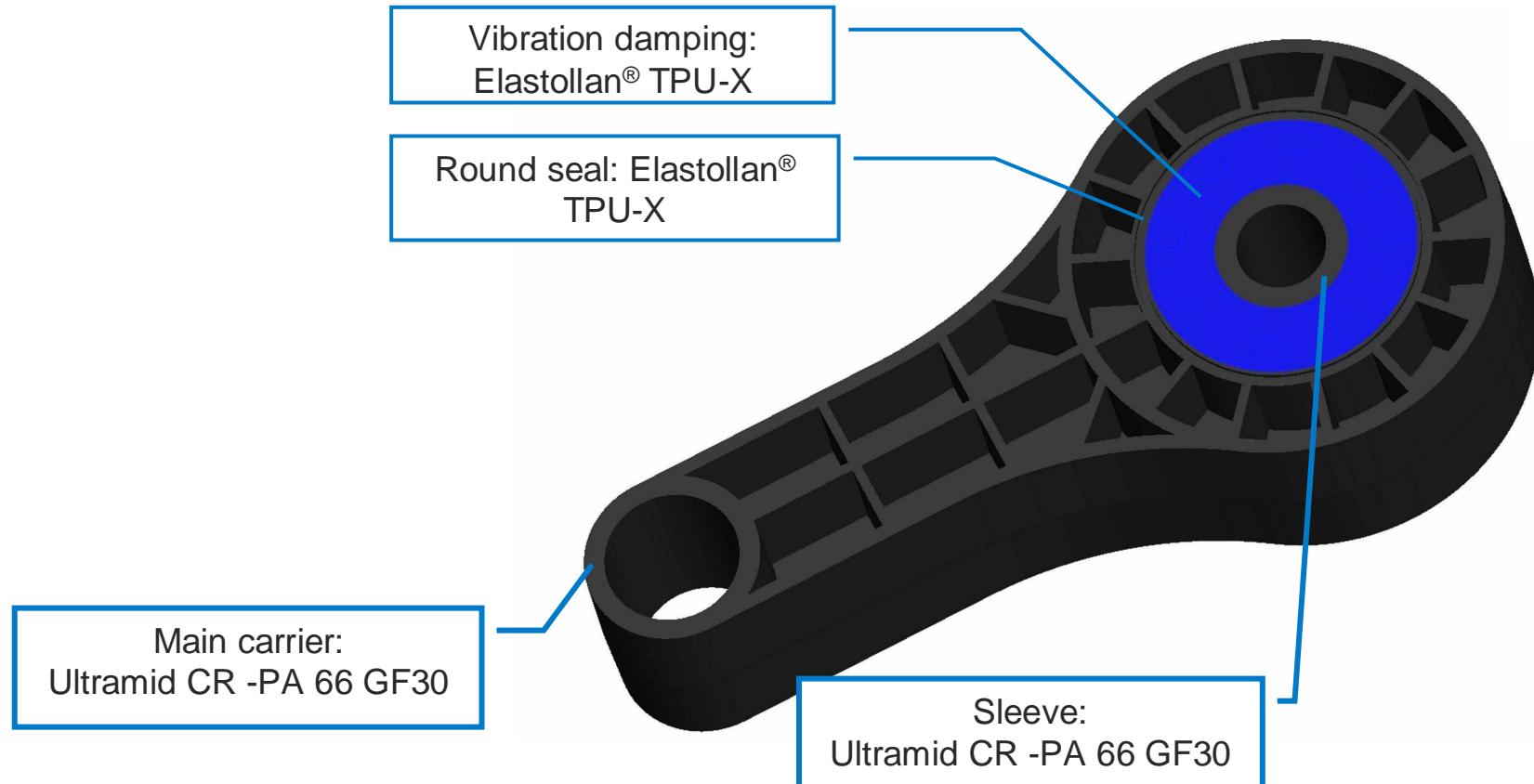
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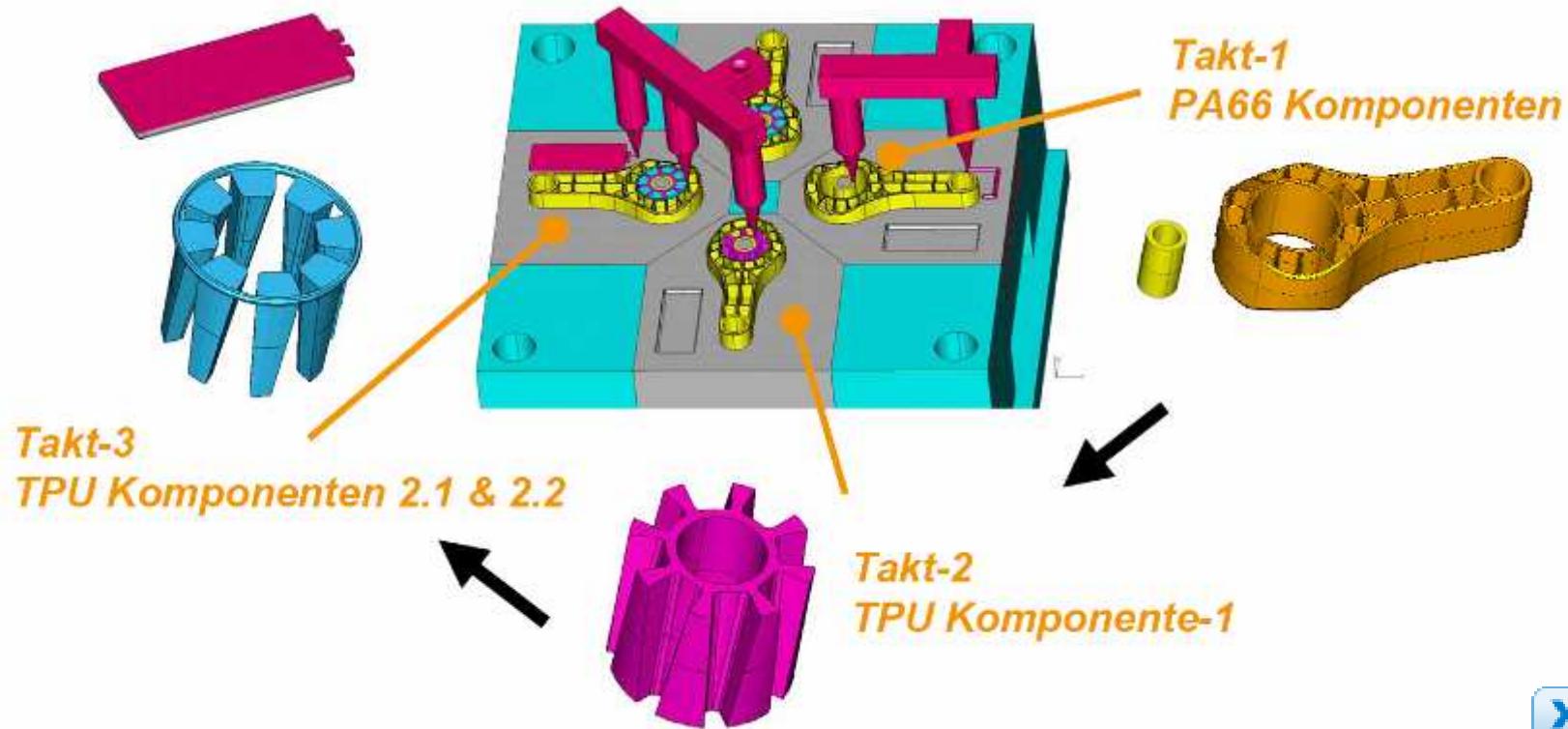
Application: Vibration-Damping Element

Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X



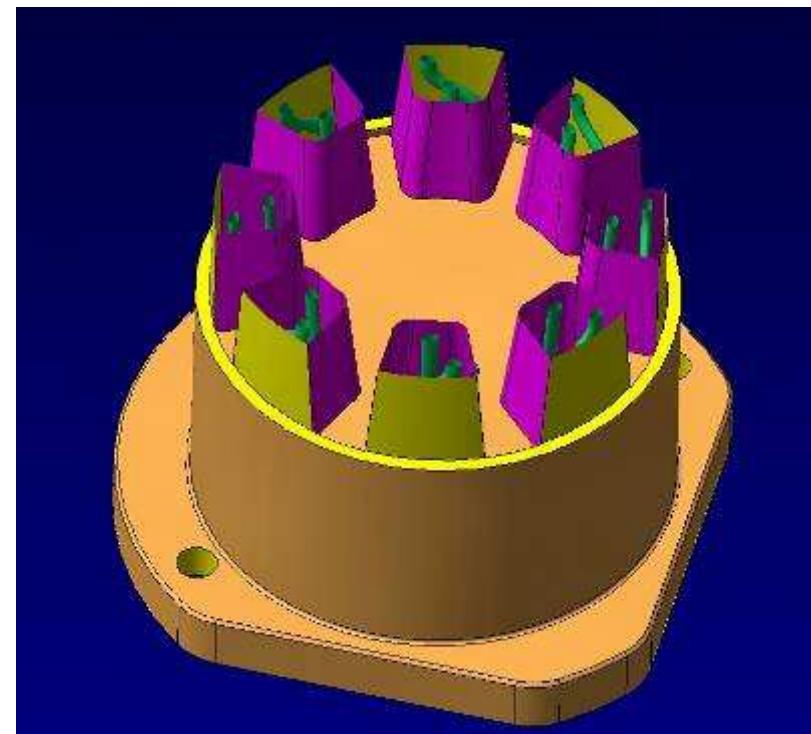
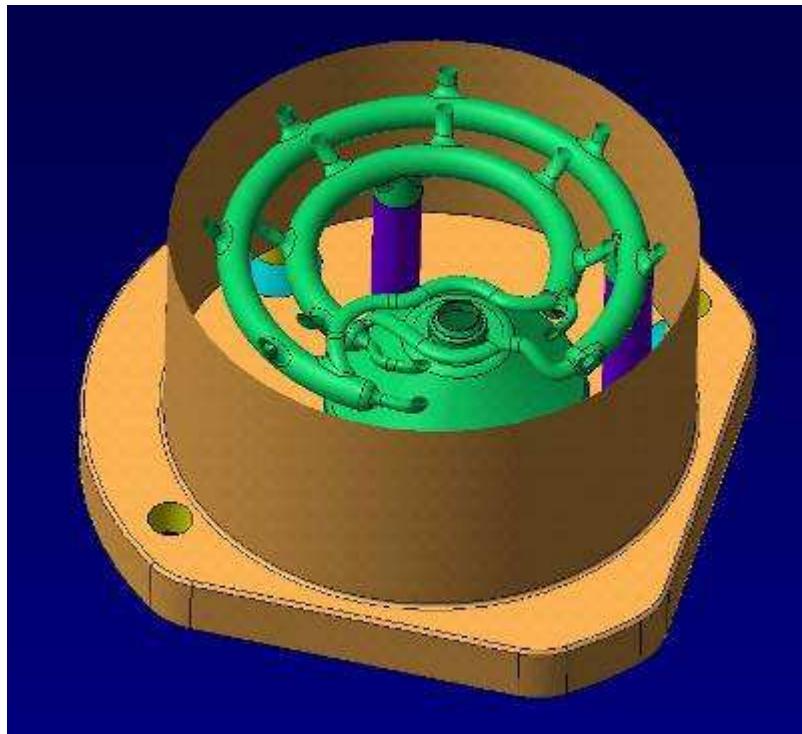
Mold concept: 4 station turn-table

Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X



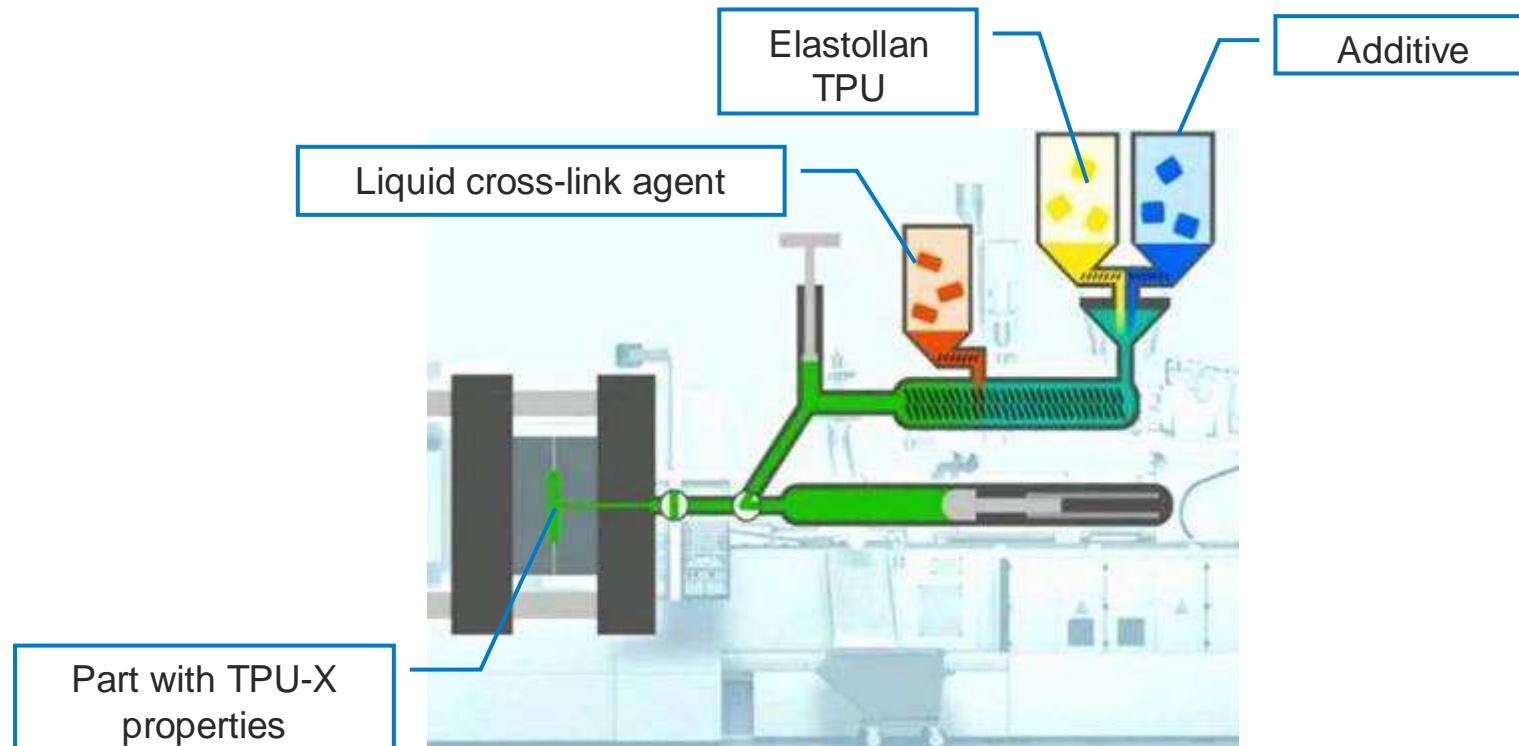
Zykluszeitziel je Takt: max. 60 s

Special „Laser-cused“ cores with conture water channels
Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X



X-Form process: continues and discontinues in on IMM

Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X



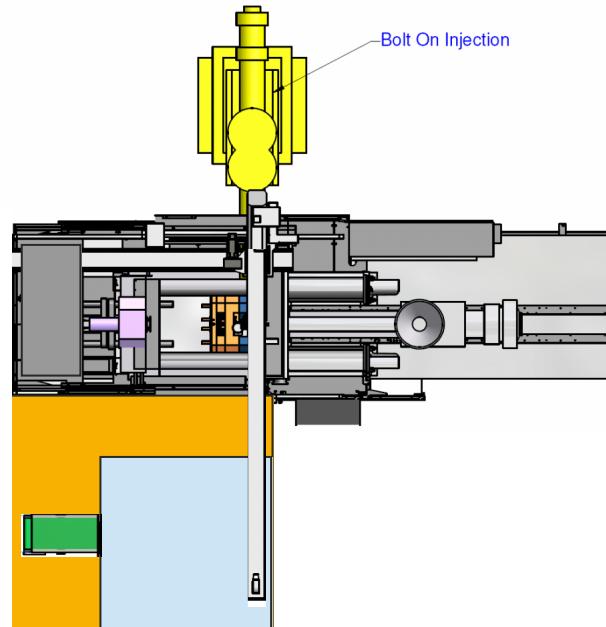
All in One – IMC, Multinjection, turn-table, compact automation... X-Form solution on CX machine base



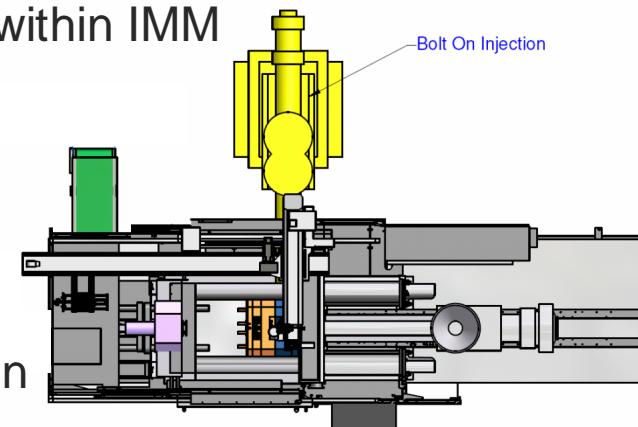
20 to 40% of space saving ... Two platen benefit

Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X

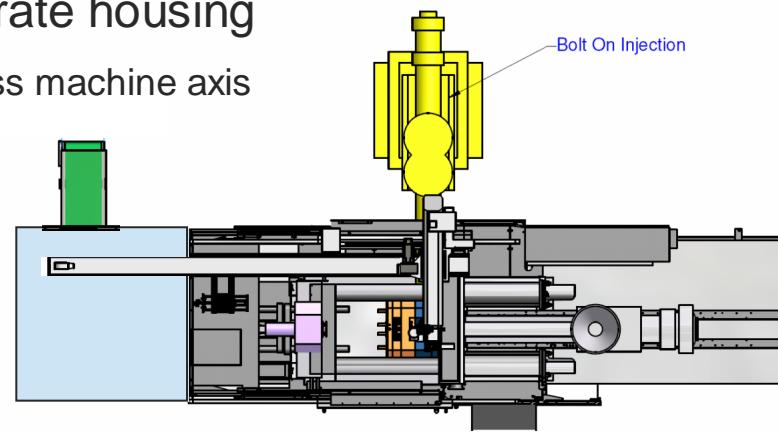
Demolding in separate
housing
- Operator side



Demolding within IMM



Demolding in
separate housing
- Across machine axis



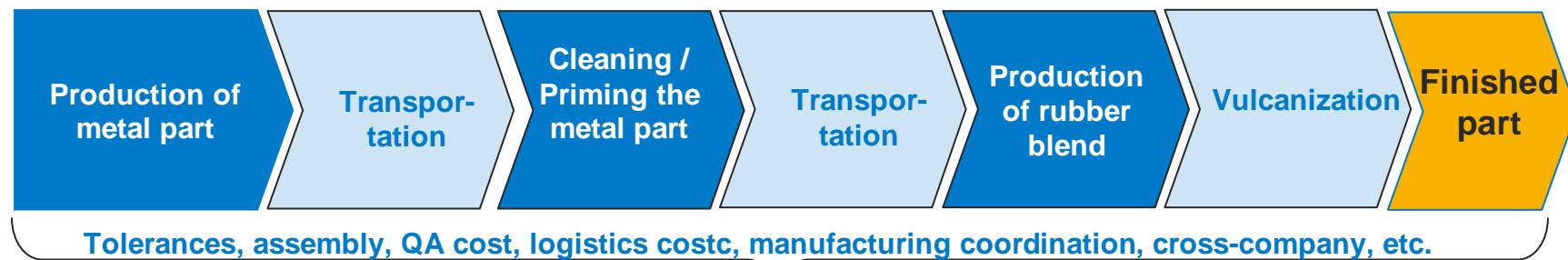
Excellent bonding behaviour to PA66 (Ultramid)
Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X



Comparison of process and production chain for:

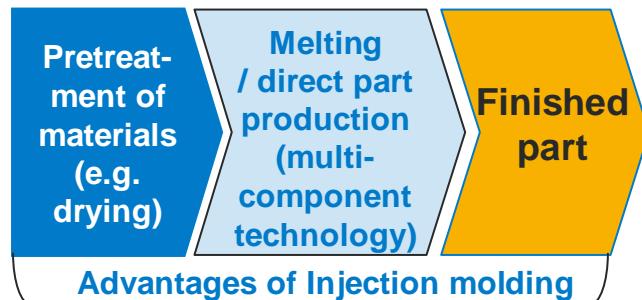
Exhibit KM 300 IMC with SP700 L-Bolt-on for TPU - X

Process chain: Rubber-Metal-Composites

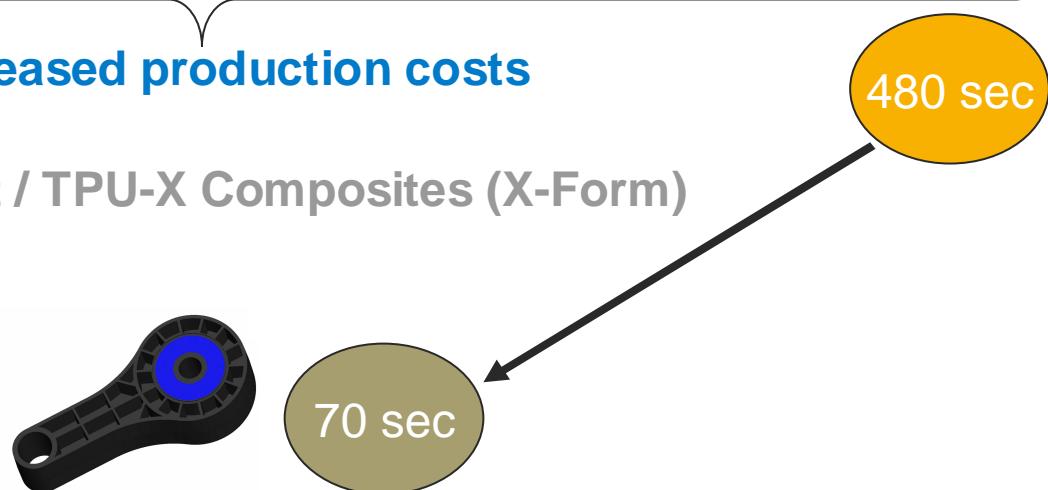


- Reduced quality and increased production costs

Process chain: Thermoplast / TPU-X Composites (X-Form)



- increased Quality and reduced production costs



Function integration for vibration damping – multi-component

Application sample automotive

Application:

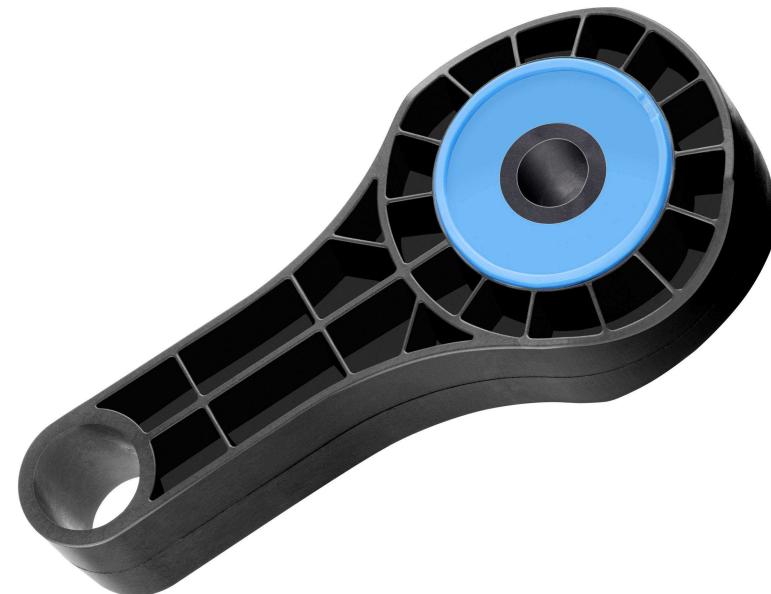
- Vibration damping element (PA66/GF 30 + TPU-X)

Innovation:

- Cross reaction process on IMC for TPU-X
- 2 Component – integrated functions and assembly process
- Cycle time reduction with 4 station turn-table

Value:

- Thermoplastic flow and processing of TPU-X
 - TPU-X with rubber properties
 - Up to 6 times fast than rubber processing
-



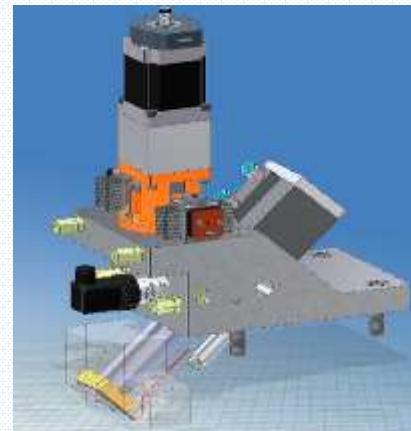
Moulding and coating in one process

Combination of different areas of expertise



Moulding and coating in one process
Combination of different areas of expertise

CoverForm



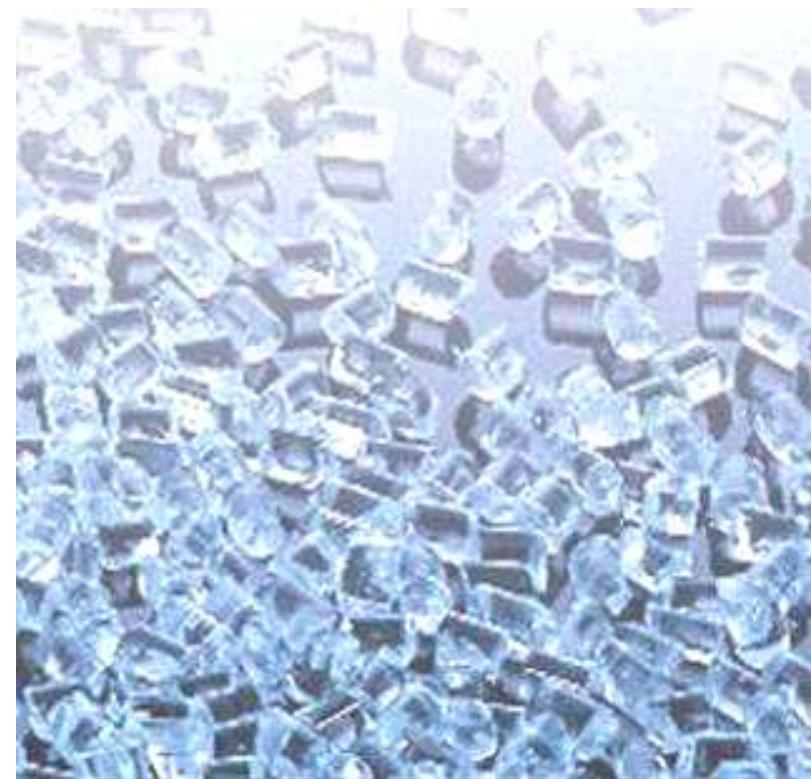
Protective coating for PMMA in one step process

Definition of CoverForm

- Applying a protective, scratch-proof layer to PMMA (Plexiglas®)
- Thin coating layers possible ($< 20 \mu\text{m}$)
- Use of acrylic-based lacquer system
- Unique development cooperation of Evonik Industries and KraussMaffei

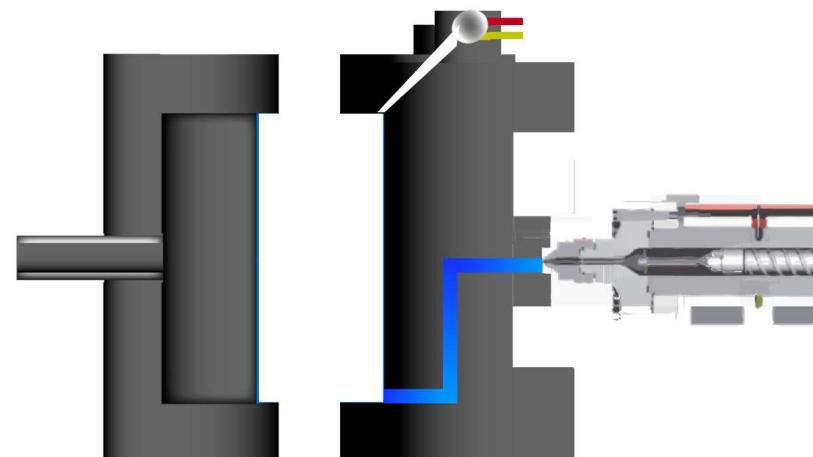
Value:

- Cost advantage process in one step



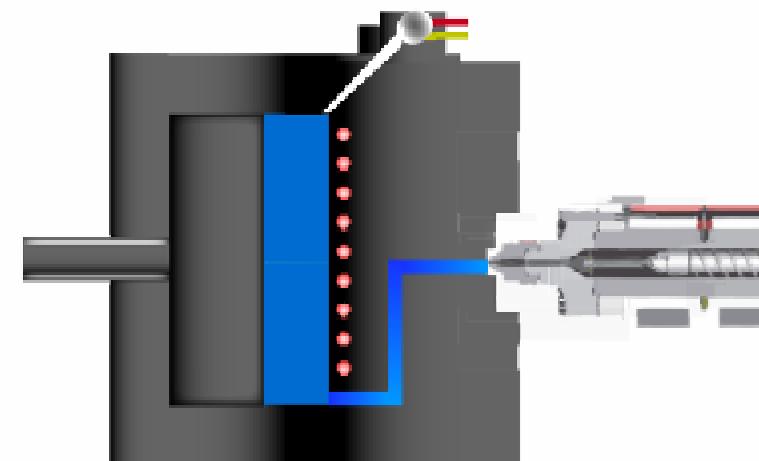
CoverForm® Prozess

- PLEXIGLAS® cf einspritzen
- Prägen und Abkühlen
- Kavität expandieren
- Reaktivlösung einspritzen
- Prägen und Heizen
- Werkzeug öffnen / Entnahme
- UV-Härtung



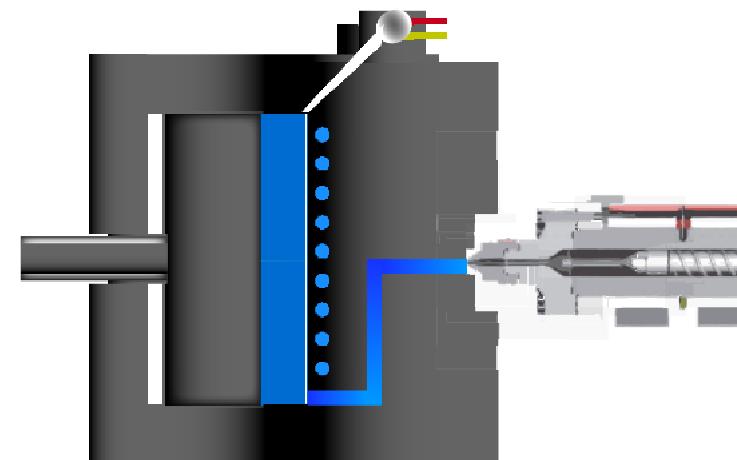
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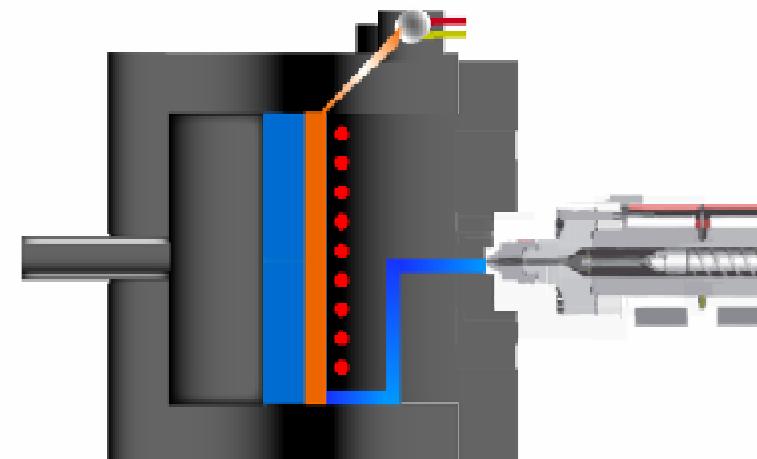
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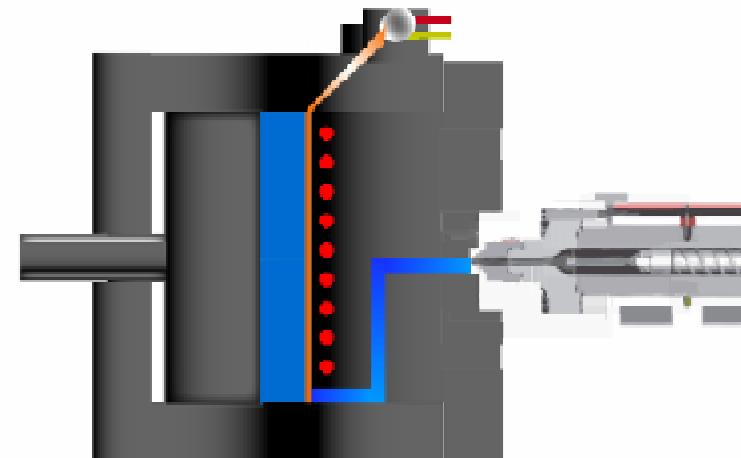
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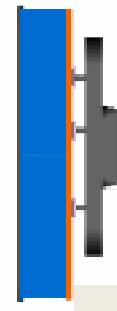
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- **UV-Härtung**



The next multi-component generation PMMA + lacquer

Application sample CoverForm

Application:

- Cover (PMMA) with foil + coating

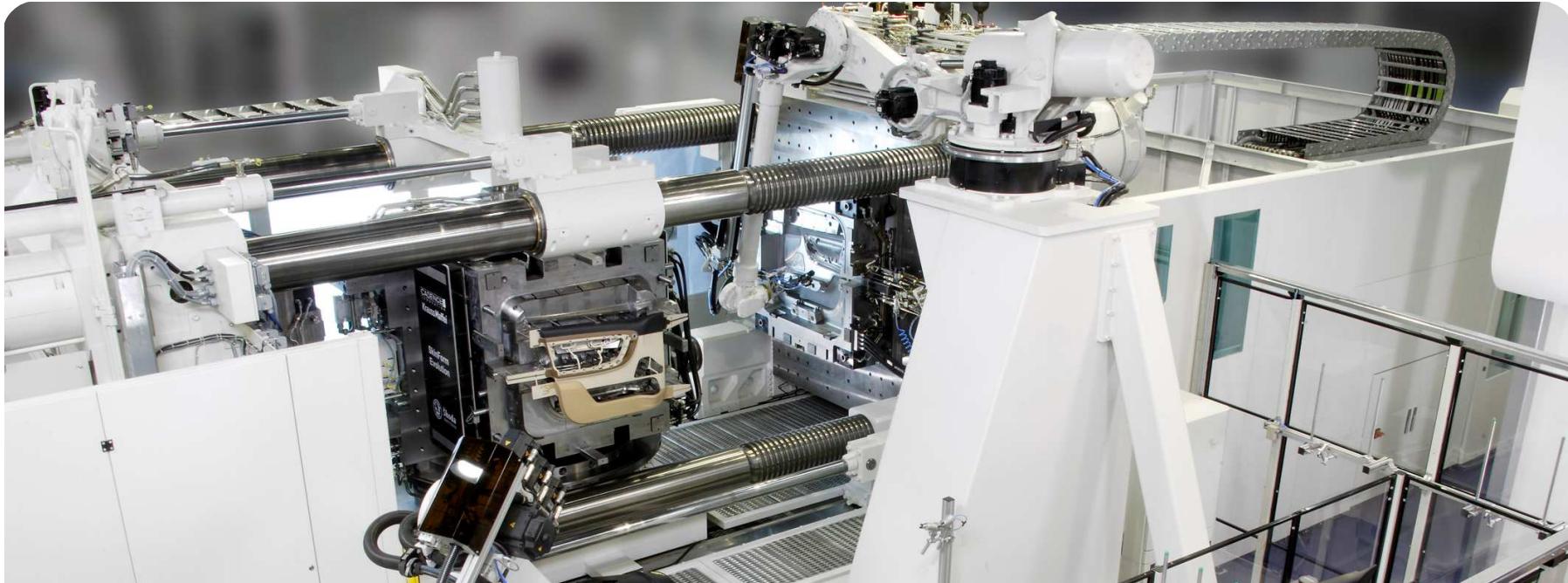
Innovation:

- New lacquer injection unit
- Dynamic mold heating
- Clean room concept for injection moulding

Value:

- Scratch resistance surface
 - Compact production system incl. automation
 - Cost advantage thru one shot process
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