Coordinated plasticising

Suitable for every product

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International Technical Support

ARBURG Technology Days
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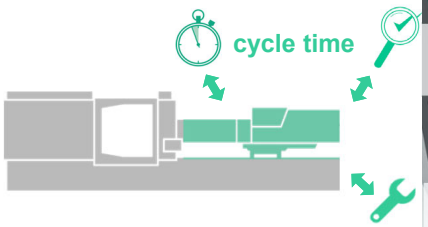
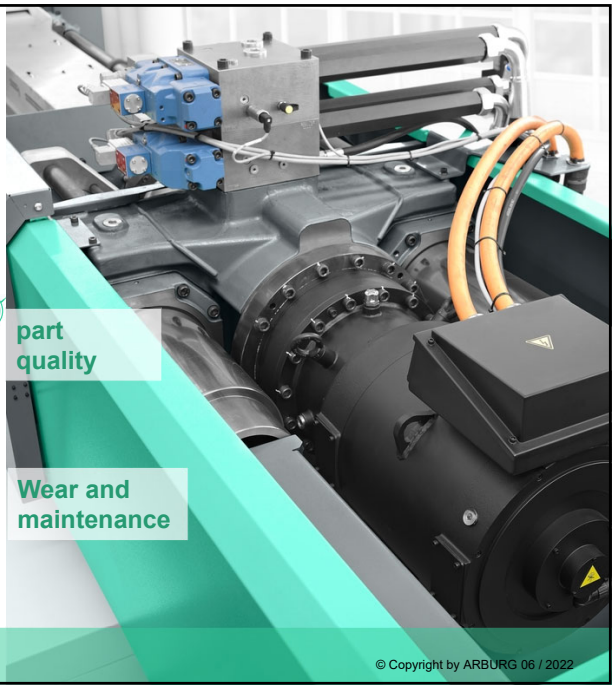
Key component plasticising





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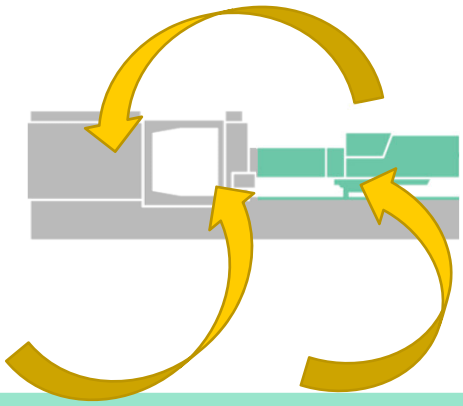
Influencing factors

- Part design
  - Wall thickness
  - Flow path lengths
  - Shot weights
- Material
- Process
  - Injection pressure
  - cycle time



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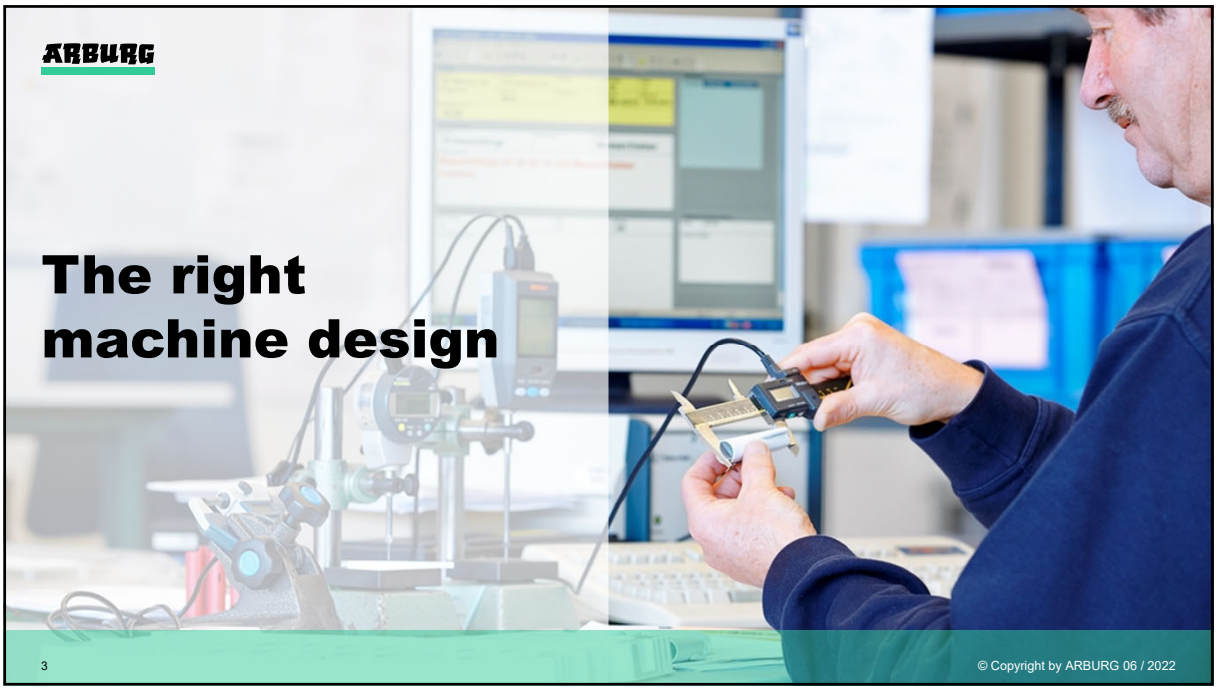
The right machine design



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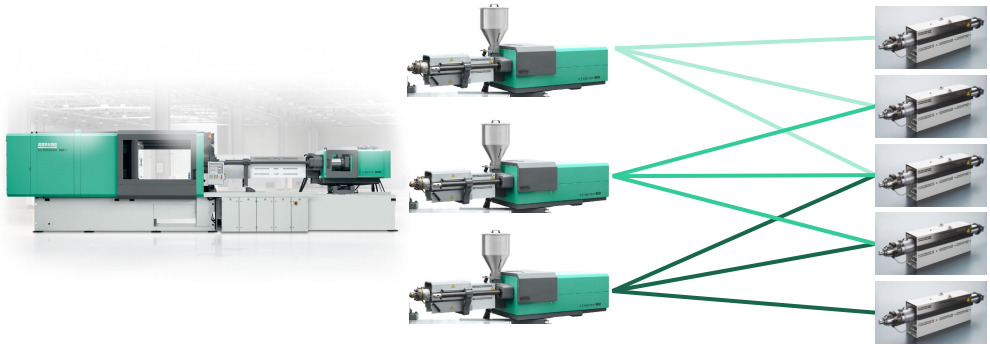
Modularity – basis for optimised selection



Parameters for correct injection unit

- Component design and tolerances
- Flow path-wall thickness ratios
- Minimum and maximum dwell time of the material

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Machine and process adapted to material

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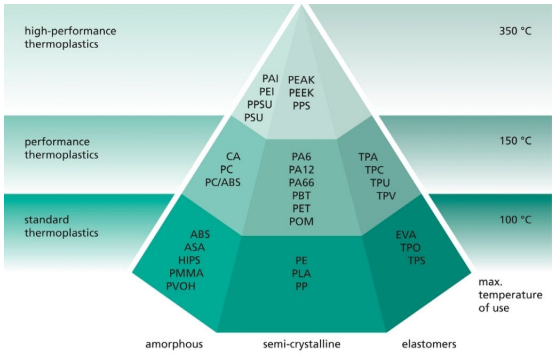
Material-dependent selection of plasticising components



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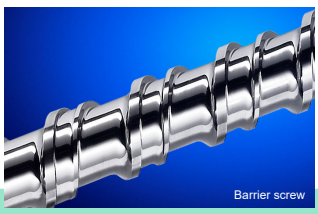
Thermoplastic screws

Screw geometry	Suitable for
Three-zone screw (with/without mixer)	Thermoplastics (general)
Barrier screw (with/without mixer)	High plasticising flow rate
PVC screw (low-compression)	Shear-sensitive materials (e.g. PVC)
HC screw (high-compression)	Partly crystalline materials (e.g. POM)



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Geometries for plasticising components

	Three-zone screw		Barrier screw	
	without mixer	with mixer	without mixer	with mixer
Suitable for	all materials	PE, PP, PS, ABS, (PC, PA)	PE, PP, PS, PET, (PC, PA)	PE, PP, PS
Melting	+(+)*	+(+)*	+++	+++
Feeding	++	++	+++	+++
Mixing	+	+++	++	+++

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* for extended units: ++

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Optimised process

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ONLY CORRECTLY SCALED PLASTICISING ENABLES THE BEST POSSIBLE BALANCING OF ALL PARAMETERS

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Case study from practice

- New “Container 2250 ml – 2-cavity” mould
- New machine
  - 820 H 4000 – 1300
  - Standard cylinder D 60
- Shot weight : 108 g/PP
- Material: Moplen EP548S (with MFI 44)
- Cycle time: 7 s

Case study from practice

Problems setting up the process

- Part cannot be filled completely
- Required injection speed is not reached
- Max. injection pressure of 2000 bar not sufficient
- Even using material with an MFI > 44 is unsuccessful

Case study from practice

- ARBURG Application and Industries requested retrofitting to
  - cylinder D 55
  - barrier screw recommended
- Results
  - Part can be filled completely
  - Required injection speed is reached
  - Max. injection pressure only 1300 bar
  - Use of the material Moplen EP548S with MFI = 44 possible

High-end hardware

- High level of in-house production
- Top quality
- Part precision
- For every material
  - the right wear category
  - the right screw design

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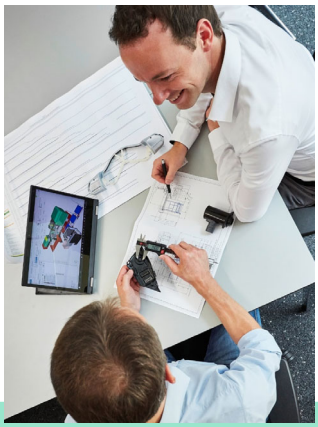
Extensive knowledge and advice

- Optimum design of the plasticising
- Experience in all sectors
- Acceptance with customer tools and experienced application engineers
  - at ARBURG
  - at your premises
- Support for new and existing machines



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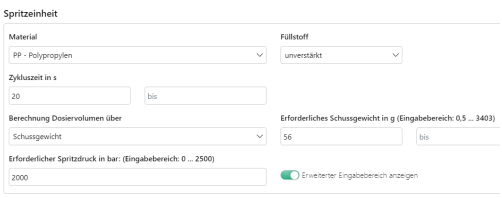
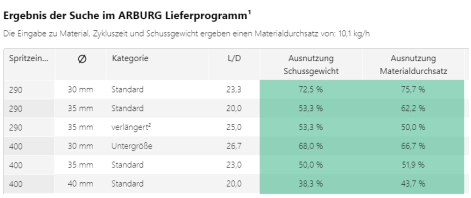
aXw MachineFinder

- Design of machines based on specific process parameters
- Premium service in the arburgXworld customer portal





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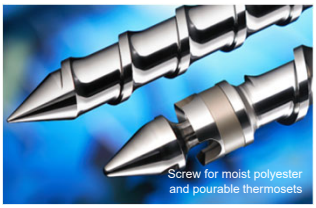
Processing of cross-linkable compounds

Thermoset	• Compression-free screw • With or without special non-return valve for moist polyester (BMC)
Elastomer	• Compression-free screw • Special non-return valve
Liquid silicone	• Compression-free screw • Special disc non-return valve


Screw for moist polyester and pourable thermosets


Disc non-return valve

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Protection against wear

Abrasion
Mechanical corrosion due to filler or already detached particles

Corrosion
Chemical-mechanical corrosion due to volatile components in the melt, e.g. additives or water

Measures by the manufacturer
- Selection of suitable materials, heat treatment and coatings
- Optimised geometry (e.g. low flow resistance)

Measures by the customer
- Process settings (e.g. adjusted speed during dosage)
- Maintenance (e.g. flushing before standstill)

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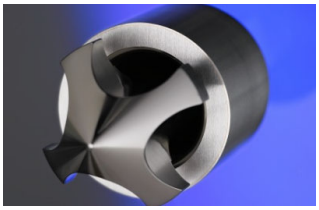
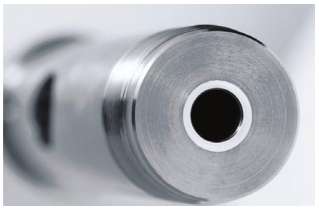
Wear protection – right combination is crucial


Non-return valve


Screw


Bimetal cylinder

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Overview of recommended uses

Wear due to		Material examples	Non-return valve	Screw	Bimetal cylinder
Abrasion	Corrosion				
Low to moderate (filler ≤ 25%)	None to low	PE, PP, PS, ABS, PA	Chrome steel	High-chrome steel	BMA
Moderate to high (filler ≥ 25%)	Low to moderate	POM, PVC, PA with GF	PM steel	PK(V)	BMA
High (filler > 40%)	Low to moderate	PA, PPA, PPS	PM steel or carbide metal	WC-reinforced	BMAK

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* for PE + PP: PM steel with carbide steel inserts

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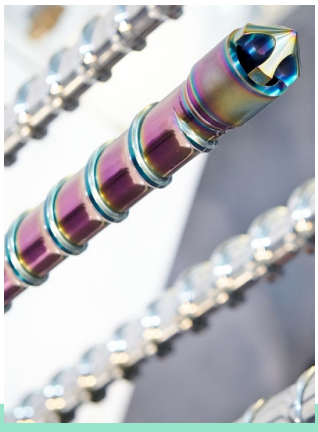
Reduce deposit formation – with PVD coating*

+	• Coating only occurs at approx. 300°C • The layers produced are slow to react – they do not react with plastic • High hardness value (> 1800 HV)
-	• Layer thickness only offers limited protection against wear Single layers: 3 µm CrN Multiple layers: up to 8 µm CrN Cr



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* PVD = Physical Vapour Deposition

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Especially for recyclate processing

- Recyclate package
- Adapted hardware and software
- Can be retrofitted for all ALLROUNDERs

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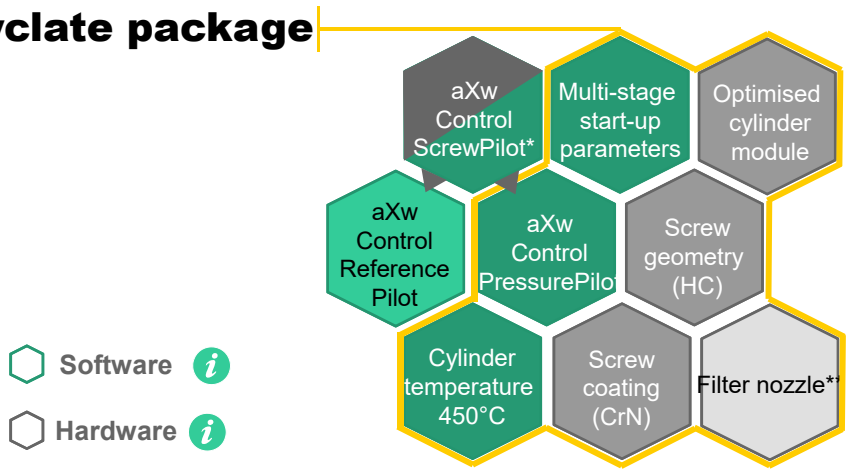
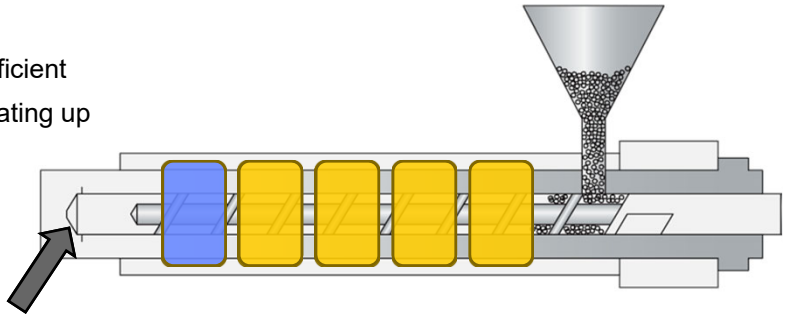
Recyclate package



* Standard for HIDRIVE, ALLDRIVE, GOLDEN ELECTRIC | optional for ALLROUNDER S | not available for GOLDEN EDITION
** Accessory pack

Full cylinder insulation – installation

- Energy efficient
- Faster heating up



"clamping ring" and "nozzle" not isolated	Zone ... Each isolated Each removable	Zones 1- 4 Each isolated Each removable

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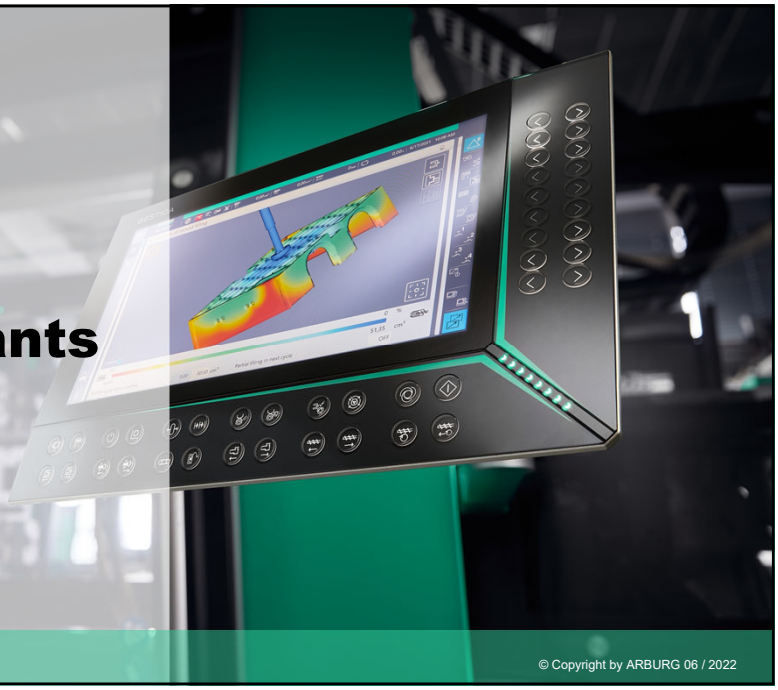
GESTICA Smart assistants



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aXw Control **MeltAssist**

- Machine recognises plasticising
- GESTICA process information
- Predictive maintenance
- Condition monitoring