

## Z-System

Partial dynamic temperature control

- Partial, dynamic cavity heating with up to 60 Kelvin/second (K/s)
- No cycle time extension
- Cycle time savings are possible by lowering the basic temperature of the tool
- Minimum energy costs (with sample tool "ice scraper" Ø 100 W)
- No licence costs
- Easy operation and integration into the production environment
- Trademark rights are registered

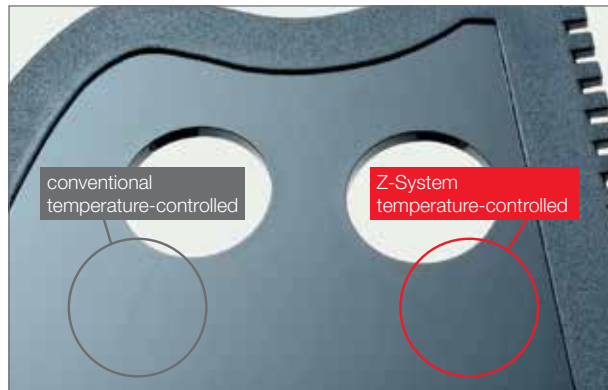
### Application examples

- Weld lines
- Jetting
- Thin-wall technology
- Partial optimization of the impression
- Surface defects (e.g. dullness)

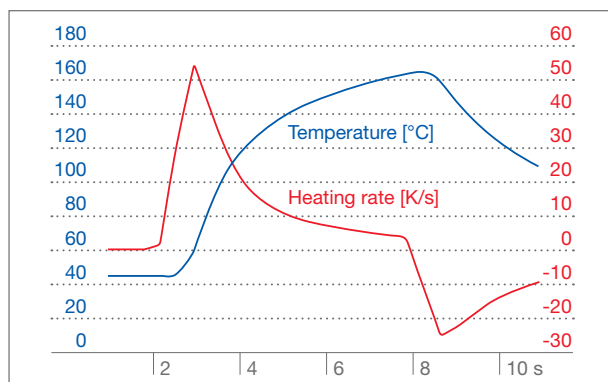
The Z-System is a collaborative project of the company Hotset Heizpatronen und Zubehör GmbH and the Plastics Institute (KIMW) in Lüdenscheid, Germany.

### Your contact partner

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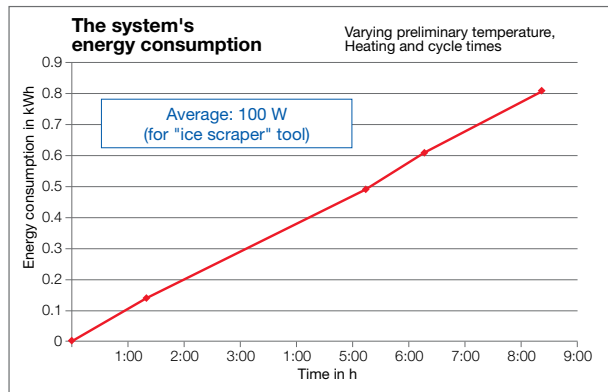
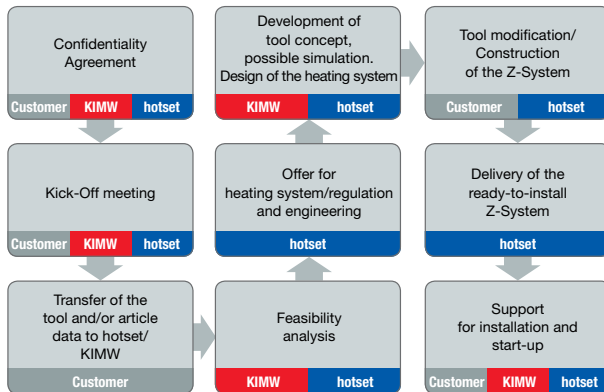


Example from the Z-System: Preventing weld lines

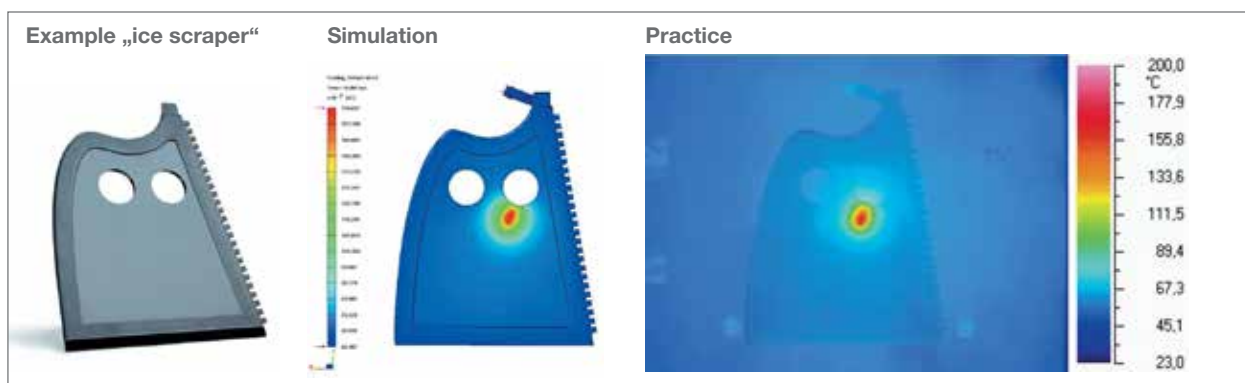


Heating rate

### Possible project procedure



Energy requirement



Comparison of simulation and practice for example tool „ice scraper“

- applies
- applies in part
- does not apply

	Fluid temperature control		Tool integrated heating		
	Water	Steam	Ceramic	Integrated inductor	Z-System
<b>Technical limits</b>					
Heating of closed tool possible	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Very high temperatures possible - suitable for all thermoplastics	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Suitable for amorphous thermoplastics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Suitable for temperature control of large area moulded parts	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Suitable for 2.5D contours	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Suitable for 3D contours	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Suitable for high gloss surfaces	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Tool and cooling</b>					
Conventional temperature control channels are sufficient	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
No special tool designs required	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Can be retrofitted for existing tools	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Economic aspects</b>					
Low system costs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Low additional costs for tools	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Low energy and operating costs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Low additional costs for safety relevant measures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Short or cycle-parallel heating time	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Low or no cycle time extension	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Heating universally applicable for all other tools	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Safety</b>					
Low safety-technical risks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Procedural applications</b>					
Partial prevention of visible weld lines	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Partial flow medium (integral hinge, thin segments)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Partial micro-structures	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Foam injection moulding of thermoplastics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Full-area heating	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Technical performance</b>					
Maximum attainable temperature [°C]	200	160	>> 200	>> 200	>> 200
Maximum attainable temperature [°F]	392	320	>> 392	>> 392	>> 392
Heating speed [K/s]	4-7	10-15	20	20-50	25-60
Pressure [bar]	18-20	7-6	0	0	0
<b>General conditions</b>					
Structural requirements specification (power supply, safety devices)	generally available	depending on performance	generally available	depending on performance	generally available