

BDCC

Böhler Die Casting Concept

voestalpine BÖHLER Edelstahl GmbH & Co KG
www.voestalpine.com/bohler-edelstahl

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ONE STEP AHEAD.

Trends:

- Parts get more complex and larger
- Increasing share of parts for e-mobility
- New technologies regarding casting, cooling (temperature management), spraying
- Surface requirements of the casted parts increase



5G server heat sinks



engine housing



battery case

Market requests:

- Shorter delivery times (tool maker to end user)
- Higher life time guaranties (tool maker to end user)
- Increasing demand on higher service levels (heat-treatment, coating, peening, AM-parts)
- Expertise and technical support in high pressure die-casting for right steel selection



"Giga-press"

HOW TO IMPROVE TOOL PERFORMANCE ?



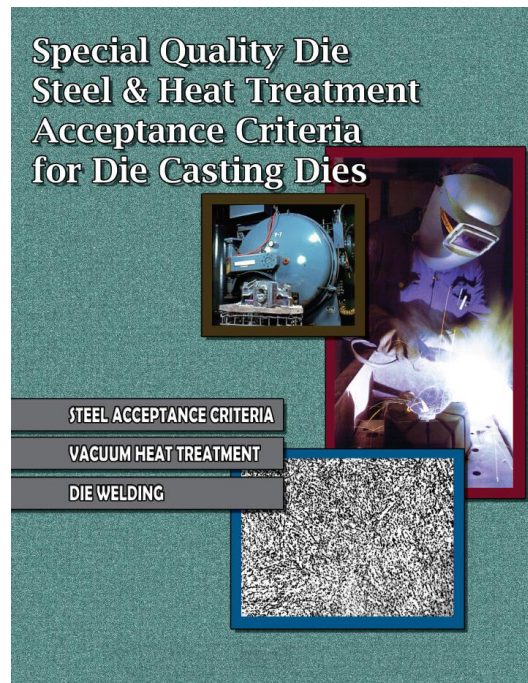
Tailor made solutions - project by project

Test secondo lo standard NADCA per i seguenti acciai:

- » **BÖHLER W300** (1.2343 - H11)
ISO BLOC®
- » **BÖHLER W302** (1.2344 - H13)
ISO BLOC®
- » **BÖHLER W350**
ISO BLOC®
- » **BÖHLER W400** (1.2340 ~H11)
VMR®
- » **BÖHLER W403** (~1.2367)
VMR®
- » **BÖHLER W360** *
ISO BLOC®

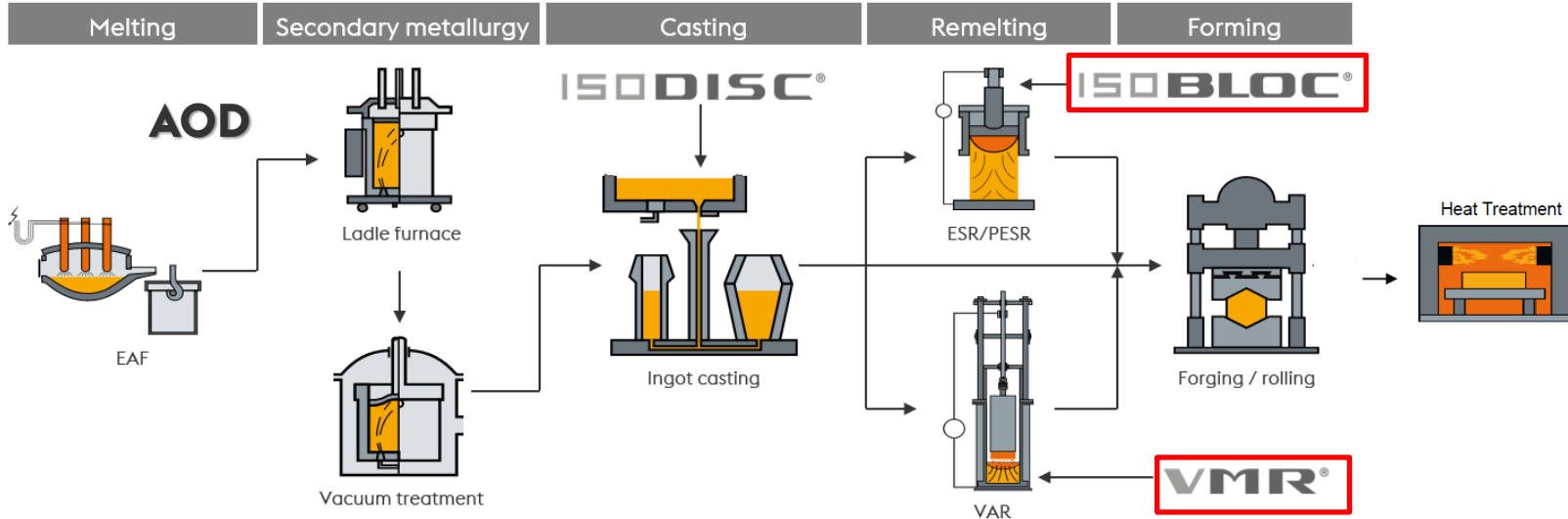
*... caratteristiche valutate ad elevata durezza

Special Quality Die
Steel & Heat Treatment
Acceptance Criteria
for Die Casting Dies

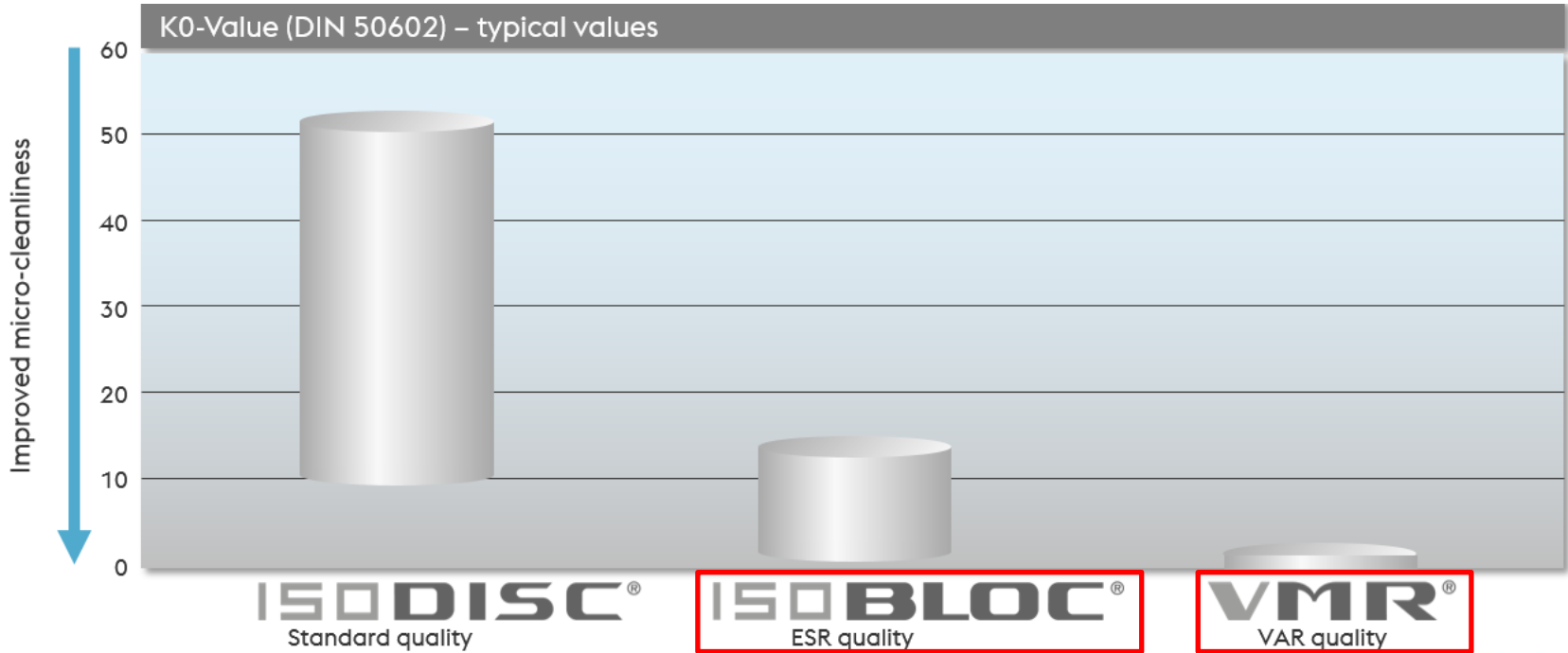


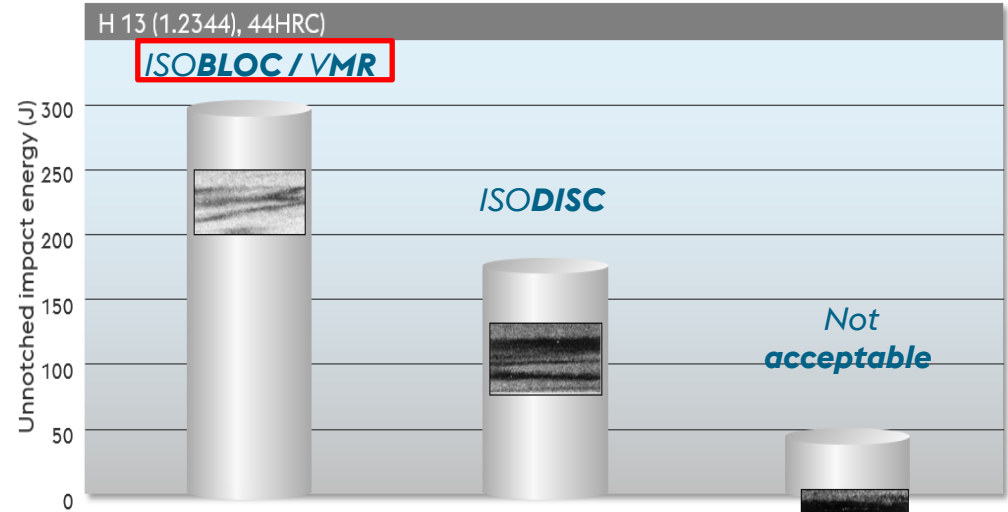
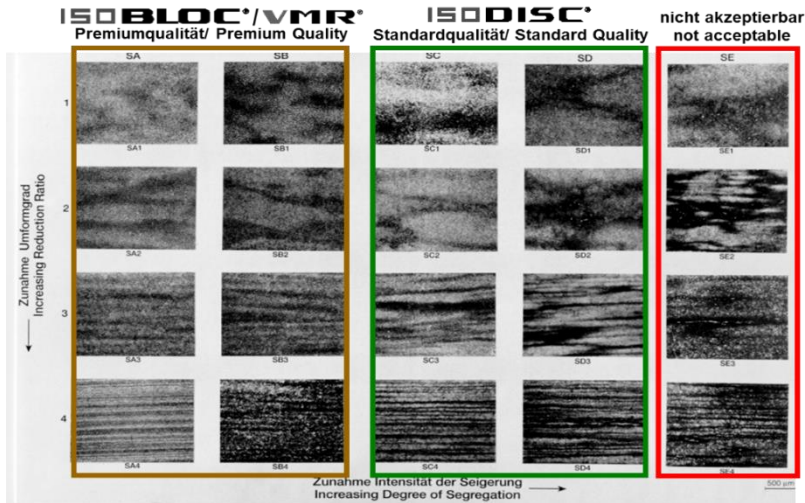
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Relevant for High Pressure Die Casting





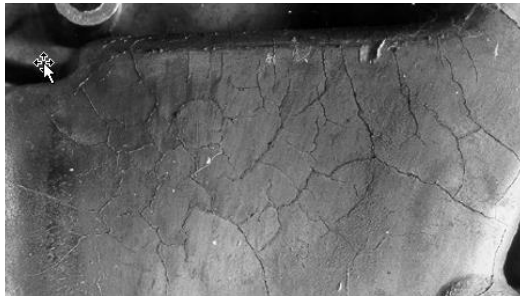
Relevant for High Pressure Die Casting

Gross-cracking

responsible for **25%** of die loses
(from internal stresses, small radii, deep cavities
heat-checking (thermal fatigue),
softening etc.)

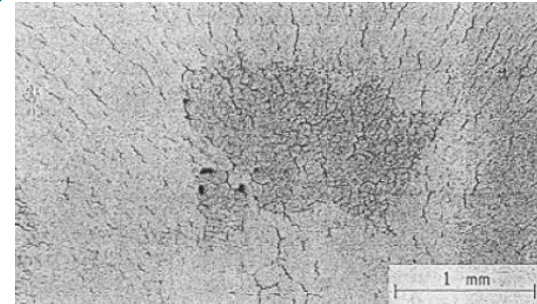
Termical fatigue

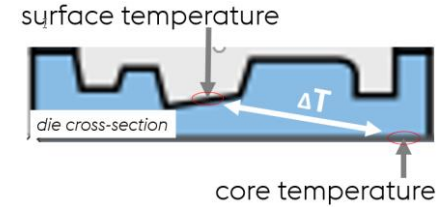
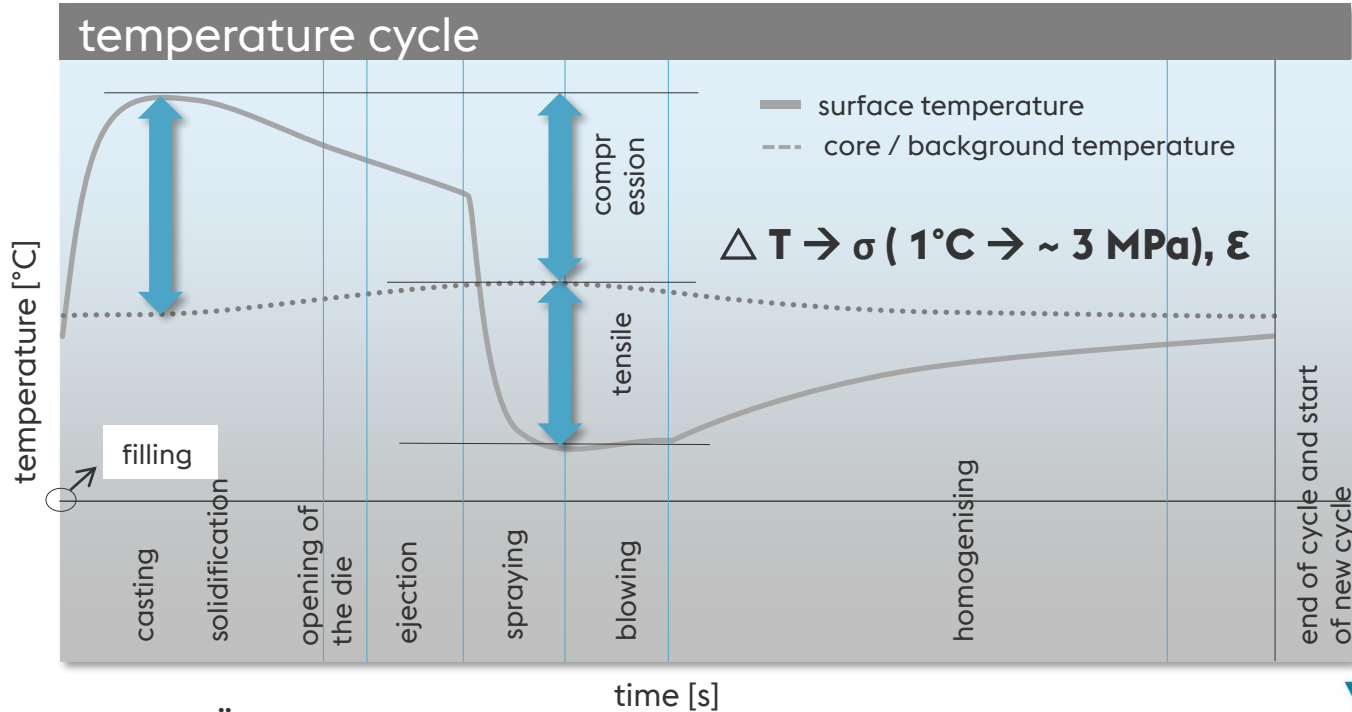
responsible for **60%** of die loses



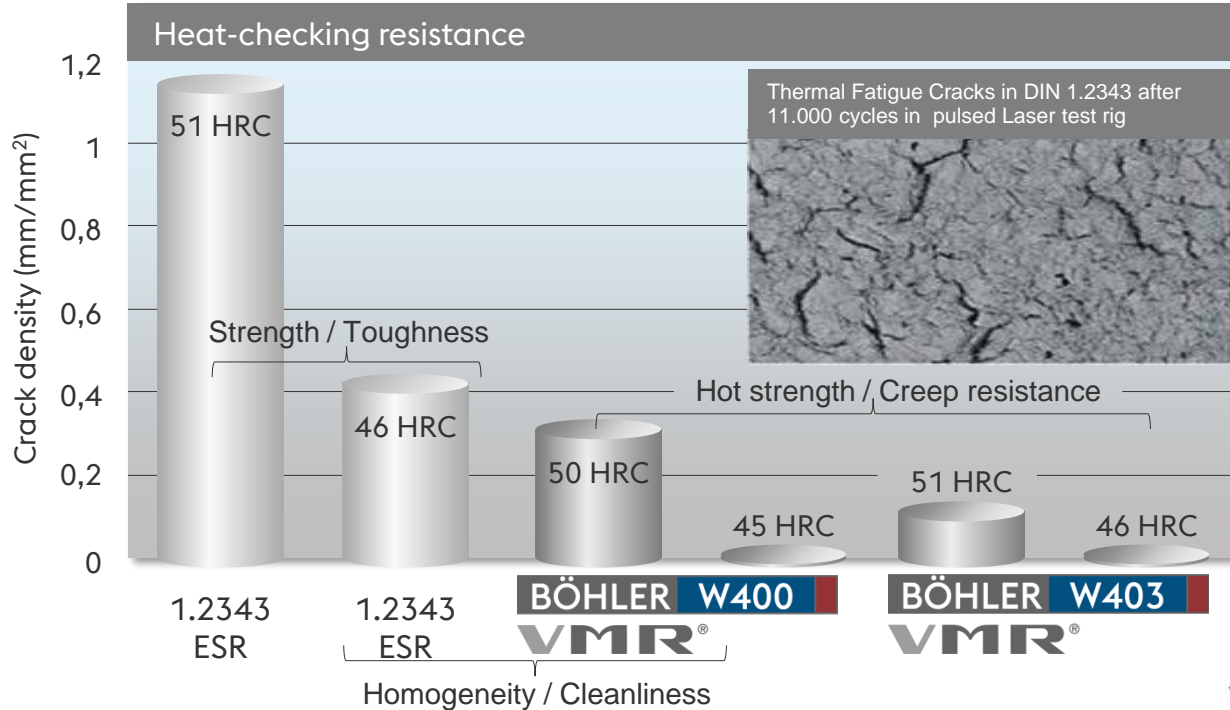
Others

wear, wash-out, erosion,
chemical attack etc.





Heat-checking resistance of very clean and homogeneous VMR grades



Stress relieving heat treatment:

Almost exclusively, we sell our hot work tool steel for high-pressure die-casting applications in soft-annealed stage.

We recommend to perform a stress-relieving heat-treatment, after rough-machining as well as after final machining and also during operation.

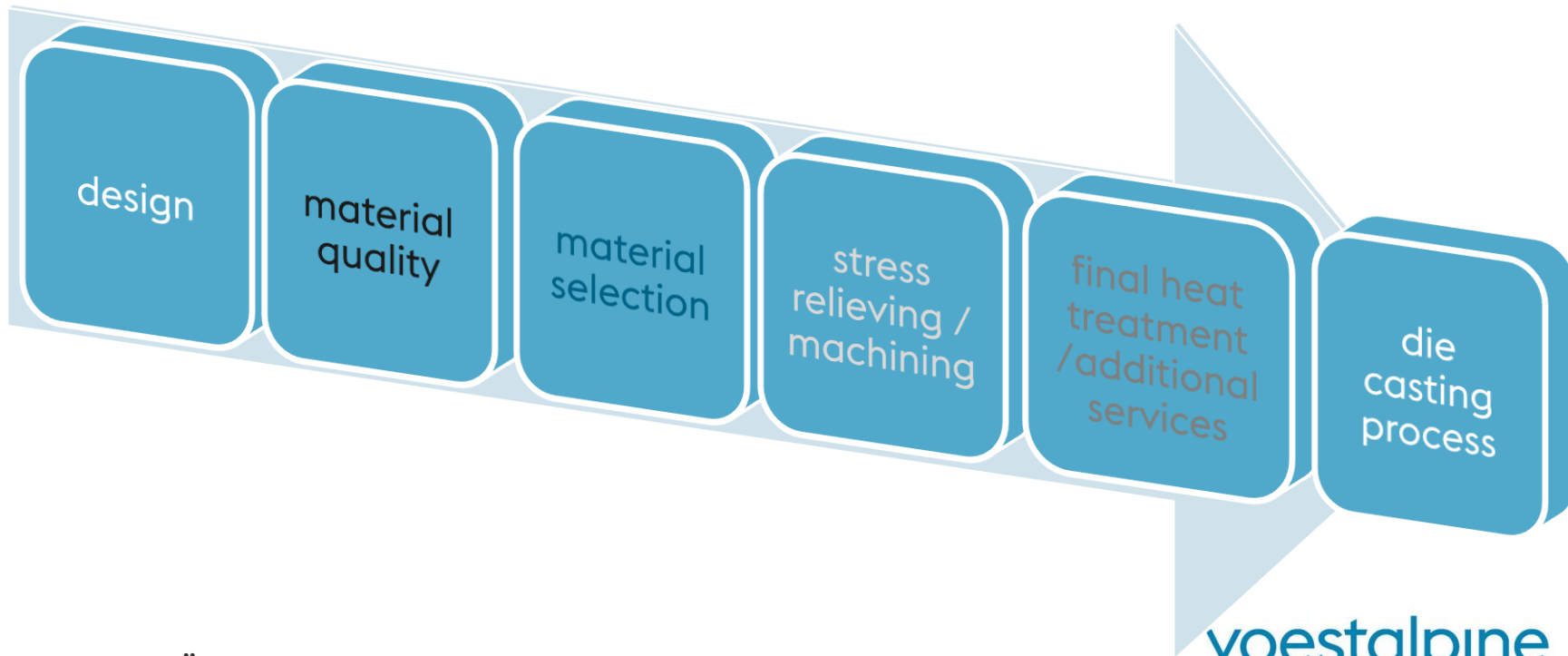
Quality heat treatment:

Pre-heating step, Austenitizing, Soaking, Quenching, ≥ 3 times tempering.

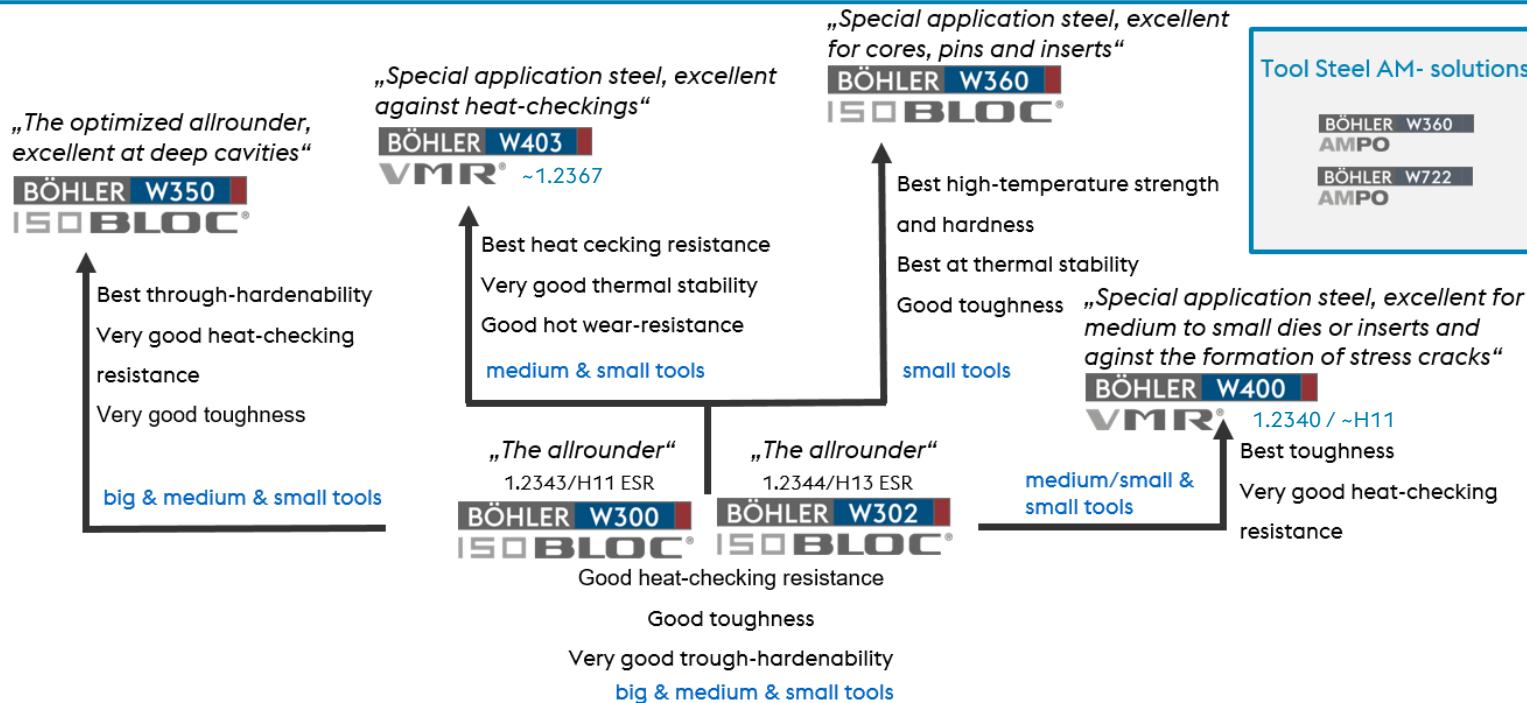
We recommend to perform the heat treatment in a vacuum furnace, exhibiting a good heat-exchanger.

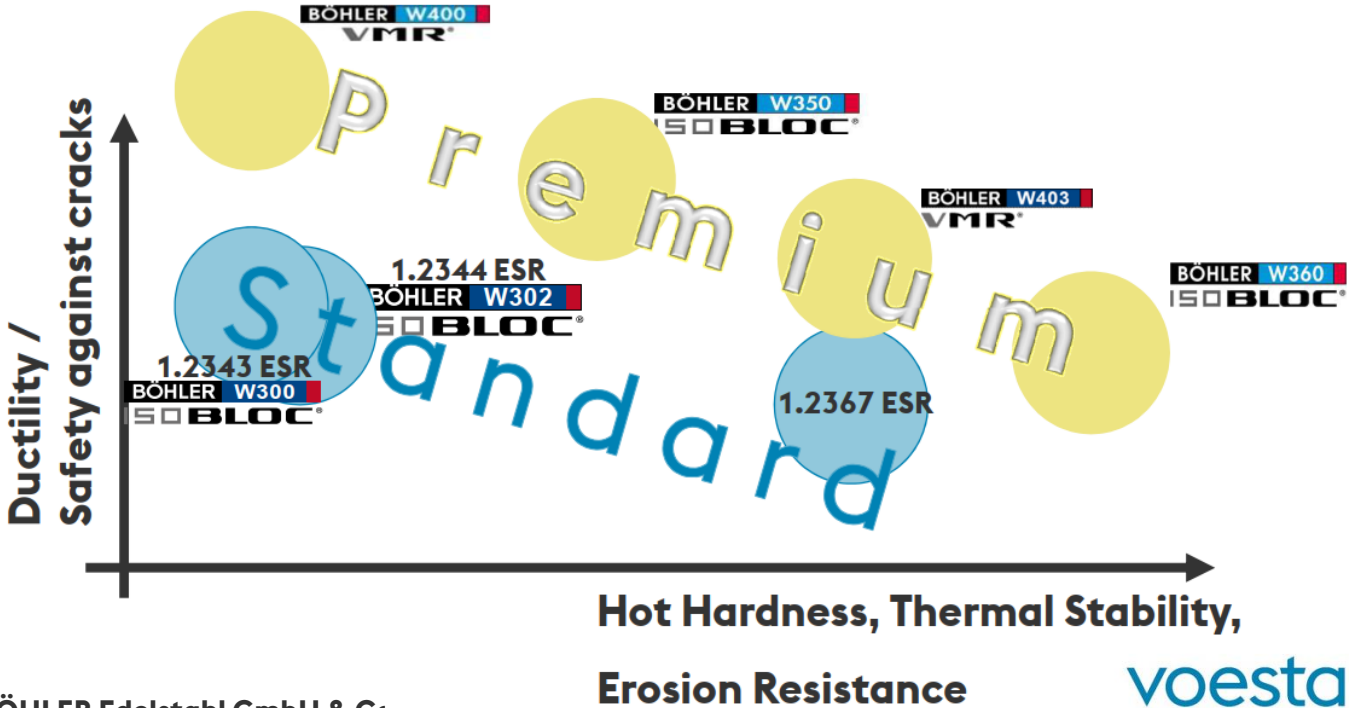
The furnace has not to be overloaded and the tool has to be positioned correctly within the chamber.

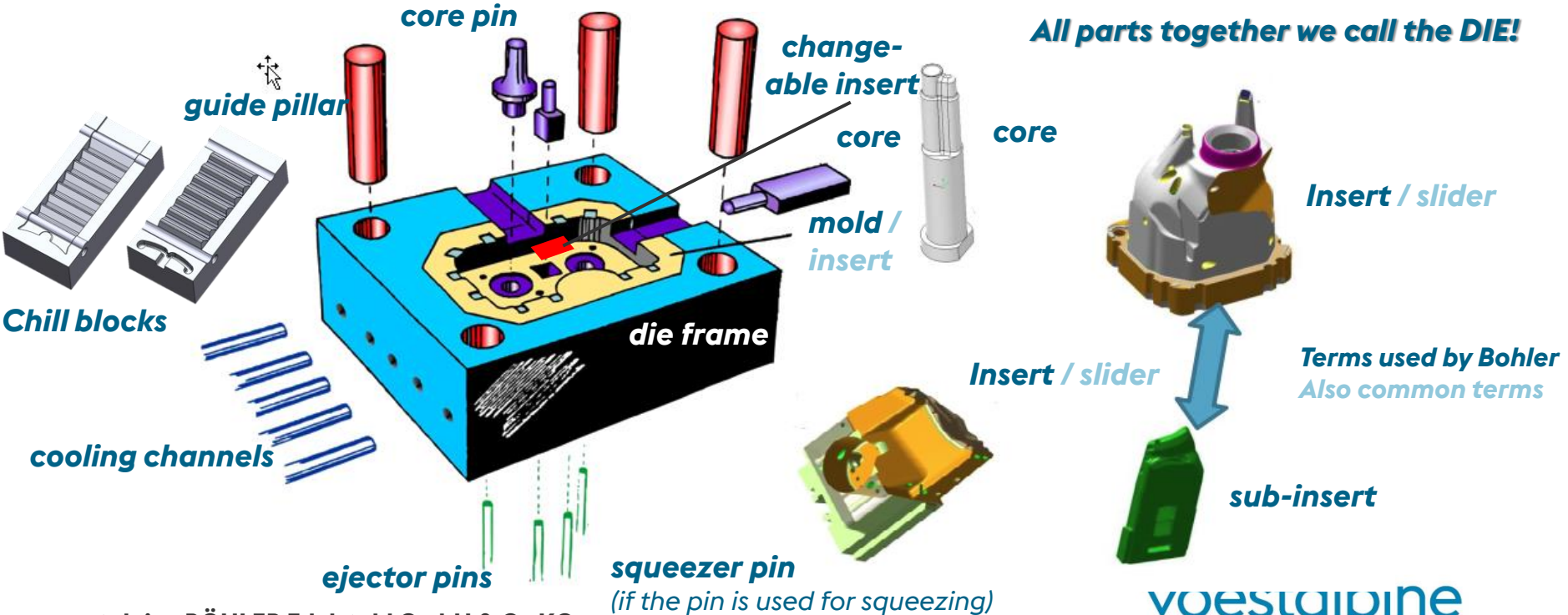
Thermocouples have to be installed withing the tool or at a size simillar dummy.



Böhler steel selection chart

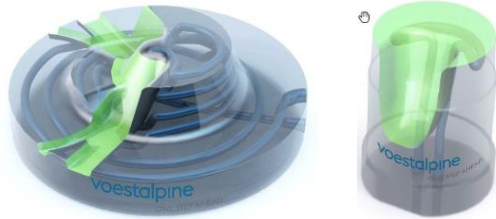






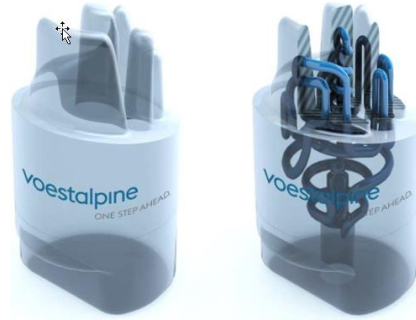
Additive manufacturing

Conformal cooled parts
(Powder bed fusion)



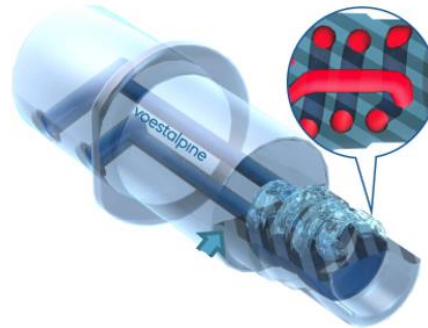
Distributor

Cycle time reduction
Life time increase



Cores, Sub-Inserts, Silders

Life time increase
Down time reduction



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Plasma nitriding & PVD coating (Duplex)

Against heat-checking, erosion, wear, soldering etc.



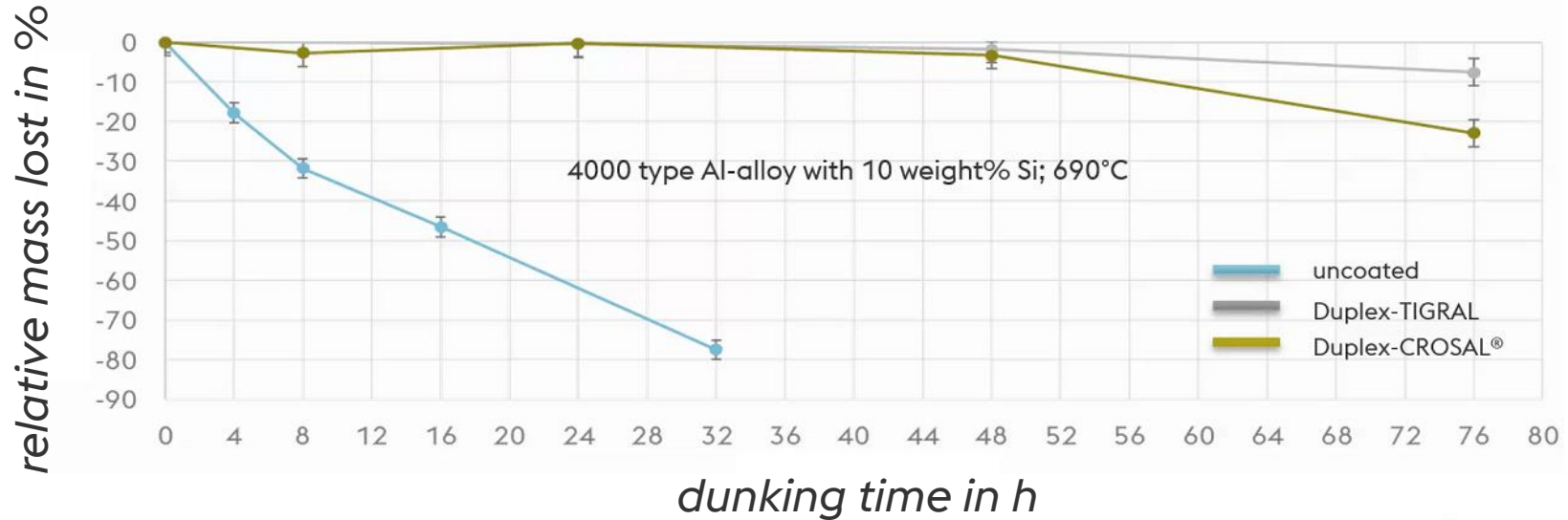
***Dies (partly), cores, core pins,
small inserts etc.***

Life time increase

- 1) *Clean and smooth (polished) surface*
- 2) *Plasma nitriding*
- 3) *PVD Coating*

PVD coatings in Al HPDC, lab test

Dipping test with cores out of 1.2343



- *Automotive*

Daimler / BMW / Audi / Renault / VW / Volvo / Dacia / Citroen /
Porsche / Ford / Opel / Continental / Vibracoustic / Wabco /
Bosch / Hella / GKN / Valeo / Land Rover / Fiat etc.

- *White Goods*

Liebherr / Gorenje / Arcelik / BSH etc.

- *Electronics*

Bosch / Siemens / Philipps / EBM Papst etc.

- *and many more*

That's all...any questions?

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