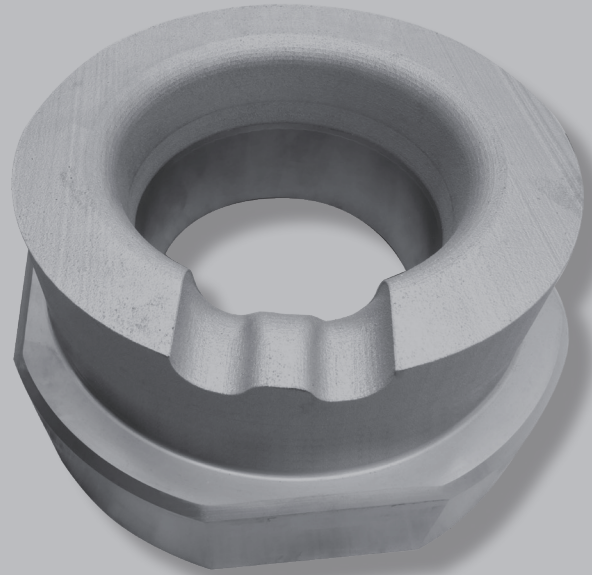


Fully AM and final machined distributor



Hybrid solution of a distributor ring (as printed)

## HIGH PERFORMANCE AM DISTRIBUTOR & DISTRIBUTOR RING SOLUTIONS

We provide HPDC industry with installation ready AM single-body distributors & distributor rings. Made from BÖHLER W360 AMPO these AM parts contain our unique Internal cooling system designs and have been proven to be an excellent solution for the effective extraction of heat from the tool body. When combined with our high performance alloys, AM is an excellent solution to reduce cycle times and increase productivity in many HPDC applications.

### Advantages of our high performance AM solutions:

- » High performance AM cooling systems enhance the rapid solidification of the injection material, resulting in improved cast structure with less defects.
- » Reduced thermal loads results in longer tool life by reducing galling, soldering and heat checking behaviour.
- » Applying optimised AM cooling solutions to parts around the gate results in faster material solidification and helps shorten the cycle time.
- » The superior material properties of BÖHLER W360 AMPO has been proven to significantly improve tool life when compared to conventional material grades.

### BÖHLER W360 AMPO – THE MATERIAL OF CHOICE FOR HPDC

This proprietary grade has been designed to outperform many traditional tool steels such as 1.2709 (Maraging 300), 1.2343 ESR (H11) and 1.2344 ESR (H13).

#### IN SHORT -

- » High temper back and hot wear resistance
- » Recommended hardness in use 48 - 56 HRC
- » High toughness
- » Designed for high demanding tooling applications like HPDC

### COMPARISON WITH TYPICAL FORGED HOT WORK TOOL STEELS

Material	Hot temp. toughness	Hot temp. wear resistance
1.2343	★★★★	★★
1.2344	★★★	★★★
1.2709	★★★	★★
BÖHLER W360 AMPO	★★★★	★★★★★

# PROVEN CUSTOMER SUCCESS

## Case 1: Comparison of Cooling Solutions (Conventional vs AM)

We compared our high performance AM solution with conventional 1.2343 (H11) and a Higher Thermal Conductivity Tool Steel with traditional internal cooling. Our solution produced using BÖHLER W360 AMPO was superior to both conventional solutions in terms of temperature efficiency & the impact of die soldering. In order to build a robust business case a hybrid AM tool was produced. Here the performance area of the tool, typically subjected to greatest mechanical and thermal stresses is printed onto a conventionally machined base. This significantly reduces the print cost of the tool, making the AM solution extremely cost effective (see fig 1).

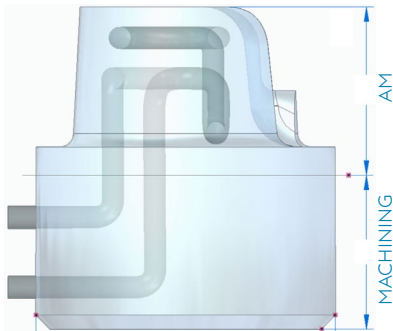
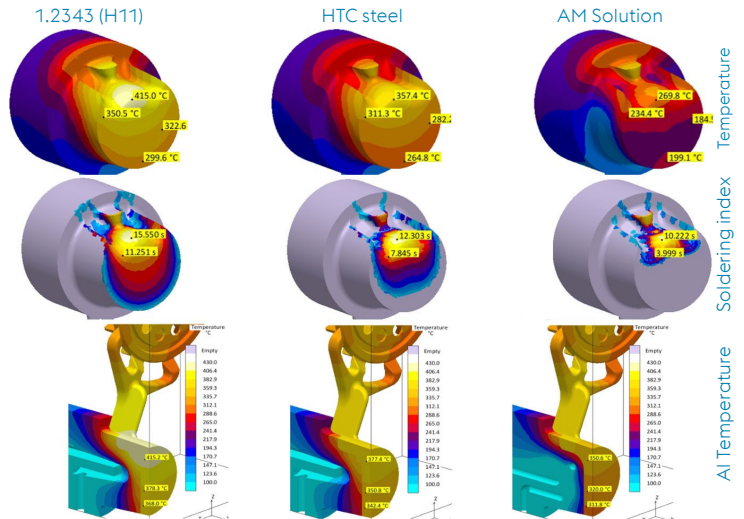
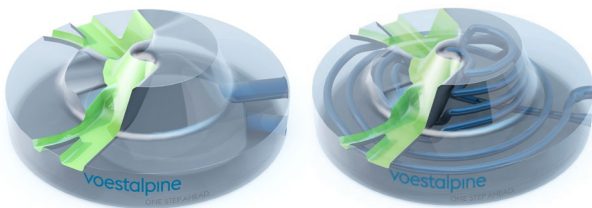


Fig 1: Hybrid Tool

	Conventional Spot Cooling		voestalpine AM
	1.2343 (H11)	HTC Steel	BÖHLER W360 AMPO
Mould Temp - Die Open (C)	385	350	220
Mould Temp - After Spray (C)	190	180	72
Die Soldering (Secs)	17	13.5	9.5

## Case 2: HPDC Customer Europe

For this customer project we optimised the cooling system and manufactured a 100% printed AM solution that reduced the product cycle time by 3.0 seconds and significantly improved the tool life the distributor by over 150%.



AM performance compared to conventional cooled 1.2343 (H11) distributor:

**Material:** BÖHLER W360 AMPO  
**Cycle time:** -3 sec  
**Life time:** > 150%

## Case 3: HPDC Customer Asia

For this customer project we optimised the cooling system and manufactured a hybrid AM solution that reduced the product cycle time by 2.5 seconds and significantly improved the tool life the distributor by over 200%.



AM performance compared to conventional cooled 1.2343 (H11) distributor:

**Material:** BÖHLER W360 AMPO  
**Cycle time:** -2,5 sec  
**Life time:** >200

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ONE STEP AHEAD.