FROM PELLET TO PART
YOUR PARTNER
FOR PRODUCTIVITY
AND SUSTAINABILITY

TRUCOOL CONFORMAL COOLED INSERTS

REDUCE CYCLE TIME, INCREASE THROUGHPUT, AND IMPROVE QUALITY

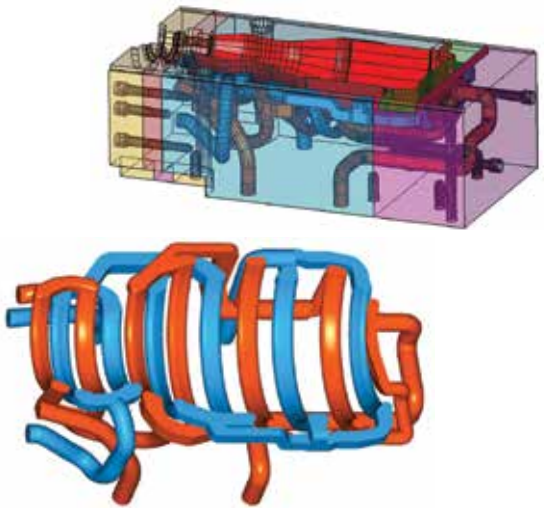
TruCool Conformal Cooling utilizes the cutting edge, Direct Metal Laser Melting (DMLM) 3D printing process to produce highly complex cavities, cores, and components with conformal cooling channels.

KEY CUSTOMER BENEFITS

- **Cycle time reduction up to 60 percent**
- **Unlimited design flexibility**
- **Improved quality**
  - Complete thermal control of mold surface
  - Optimized cooling eliminates hot spots
  - Improved dimensional stability
  - Minimizes thermal drift which causes warpage, sink and distortion
- Process control over cooling cycle
- Increase production capacity
- Decrease cavitation

BUILD THE UNMACHINEABLE

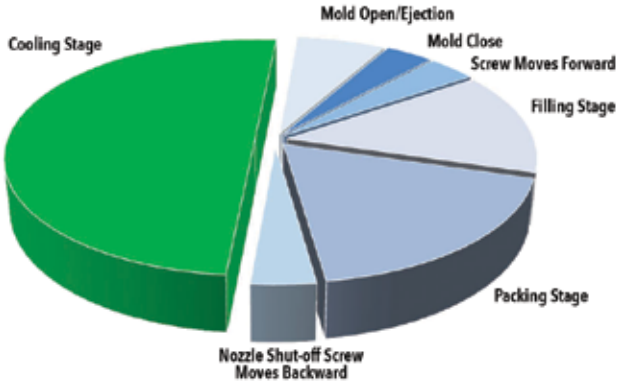
Conformal Cooling achieves shapes, paths, and channel geometries impossible to obtain with conventional tooling. Our proprietary 3D formulation technology, for metal powder processing, enables the delivery of 3D printed metal without porosity that is superior to other standard off-the-shelf formulas used by the competition.



COOLING IS YOUR NEXT BIG OPPORTUNITY

Cooling often is the largest portion of the molding process, opening the door for major improvements and savings

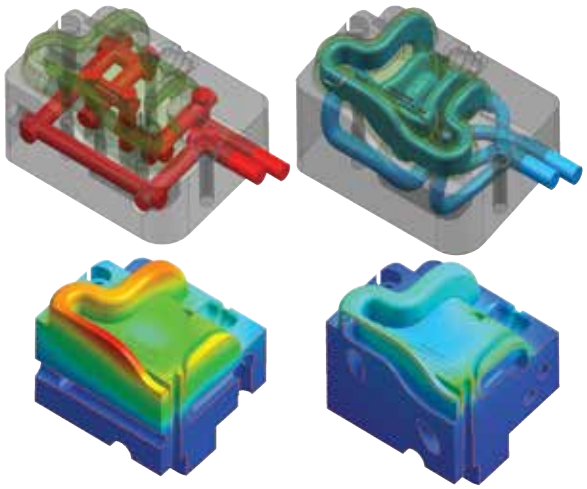
Typical Injection Molding Cycle *(% of total processing time)*



YOU ARE IN CONTROL

By controlling both the hot and *NOW THE COLD HALVES* you have full process parameter control. Your design solution places cooling (or heating) channels at the optimal distance from the part surface, allowing the mold to maintain a targeted, consistent temperature for complete thermal control.

CONVENTIONAL MACHINED COOLING | **TruCool 3D PRINTED COOLING**



TruCool conformal cooling provides superior heat transfer over conventional cooling technologies.

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WHERE ADVANCE COOLING MATTERS

- Long cycle times
- Challenging mold geometry
- Deformed parts/poor quality
- Variation of part wall thickness
- Minimal cavity spacing
- Precise dimensional tolerances
- High cavity molds
- Family molds
- Alternative to brazing when 3D is needed
- Integrated conformal venting

Maraging steel (MS1) includes Chromium, which increases its corrosion resistance. Strength and thermal conductivity is similar to H13 steel and better than Stavex ESR.

ADDITIONAL MATERIALS

Aluminum, CX Stainless

OUR VALUE ADDED OFFERING

DESIGN SERVICES

- FEA analysis of conventional solution
- Design of conformal channels
- Simulation and comparative analysis
- Addition of mill stock

MANUFACTURE & TEST

- 3D print of insert
- Flow and pressure test
- Dimensional verification
- Heat treat

WARRANTY

- One year

MATERIAL PROPERTIES

of parts at 20°C (68° F) for EOS Maraging Steel MSI

	MSI Steel Powder		Hardened (6hr heat treat)	
Mechanical Properties	**Metric**	**Inch**	**Metric**	**Inch**
Hardness	typ. 33-37 HRC		typ. 50-56 HRC	
Ultimate Tensile Strength			min. 1930 MPa	min. 280 ksi
in horizontal direction (XY)	typ. 1100 ± 100 MPa	typ. 160 ± 15 ksi	typ. 2050 ±100 MPa	typ. 297 ± 15 ksi
in vertical direction (Z)	typ. 1100 ± 100 MPa	typ. 160 ± 15 ksi		
Yield Strength			min. 1862 MPa	typ. 270 ksi
in horizontal direction (XY)	typ. 1050 ± 100 MPa	typ. 157 ± 15 ksi	typ. 1990 ± 100 MPa	typ. 289 ± 15 ksi
in vertical direction (Z)	typ. 1000 ± 100 MPa	typ. 145 ± 15 ksi		
Elongation at Break	min. 2%		min. 2%	
in horizontal direction (XY)	typ. (10 ± 4)%	typ. (10 ± 4)%	typ. (4 ± 2)%	
in vertical direction (Z)	typ. (10 ± 4)%	typ. (10 ± 4)%		
Modulus of Elasticity				
in horizontal direction (XY)	typ. 160 ± 25 GPa	typ. 23 ± 4 Msi	typ. 180 ± 20 GPa	typ. 26 ± 3 Msi
in vertical direction (Z)	typ. 150 ± 20 GPa	typ. 22 ± 3 Msi		
Thermal Conductivity	typ. 15 ± 0.8 W/m °C	typ. 104 ± 6 Btu in/(h ft² °F)	typ. 20 ± 1 W/m °C	typ. 139 ± 7 Btu in/(h ft² °F)
Specific Heat Capacity	typ. 450 ± 20 J/kg °C	typ. 0.108 ± 0.005 Btu/(lb °F)	typ. 450 ± 20 J/kg °C	typ. 0.108 ± 0.005 Btu/(lb °F)
Polishing (very finely polished)	Rz up to <0.5 µm	Rz up to <0.02 x 10^{-3} in	Rz up to<0.5 µm	Rz up to <0.02 x 10^{-3} in
Density	8.0 - 8.1 g/cm³	0.289 - 0.293 lb/in³	8.0 - 8.1 g/cm³	0.289 - 0.293 lb/in³

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COMPLETE PRODUCT DETAILS

DME MOLD Components

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