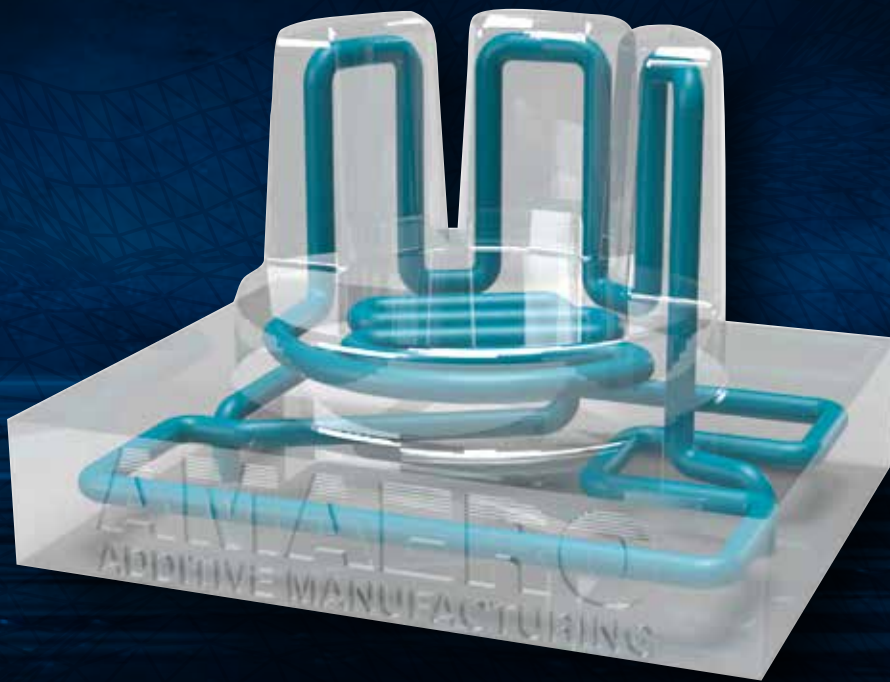


# AMAERO

ADDITIVE MANUFACTURING

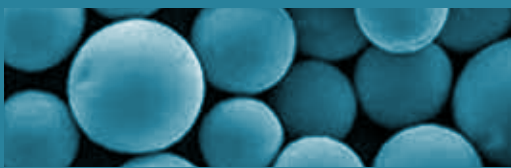


**TOOLING  
BROCHURE**



## IMPROVING MANUFACTURING PRODUCTIVITY, PRECISION AND EFFICIENCY

Amaero provides world-class research and development capability, high-end technical advice, and extensive experience in design for additive manufacturing to improve tooling manufacturing productivity, precision and efficiency.



### OUR MATERIALS

We use a range of tool steel powders, including Maraging Steel (MS1), Hot work tool steels (H13), stainless steels, Hastelloy, INVAR36 and Cobalt Chrome.

Talk to us about your specific material requirements.

- Hastelloy X
- SS 17-4
- AlSi10Mg
- AlSi7Mg
- MS1
- IN625
- INVAR 36
- SS 316
- Ti6Al4V
- H13
- CoCr MP1
- IN738



We drive significant manufacturing productivity improvements, which include:

- Faster tooling manufacturing
- Improved tooling design, which leads to higher productivity in the component manufacturing processes
- Shorter lead times for prototype parts, tool manufacture and production
- More complex tool designs incorporating features previously not possible, such as close-to-the-cavity features, matrix structures, and venting
- Use of conformal cooling to improve die life, reduce cycle times
- Improved product quality and reduced rejects
- Reduced heat checking and soldering in die casting
- Optimised product design with less material and lightweight with our integrated research, design, prototyping, manufacturing and machine sales services
- We help our tooling manufacturing customers increase efficiency, robustness and precision.

### OUR TOOLING SERVICES

Amaero produces customised, precise, high-quality, and robust tooling components. We create specialised tooling for the following manufacturing processes:

- Die casting
- Plastic injection
- Blow moulding
- Aluminium extrusion
- Rubber moulding
- Glass processing

Our team has extensive experience in metal casting and metal 3D printing, including plastic injection moulding and metal die-casting moulds for high-volume manufacturing.

We have three manufacturing facilities in the US and Australia, access to two leading research universities, an assured supply chain, and proven expertise in product design and optimisation.

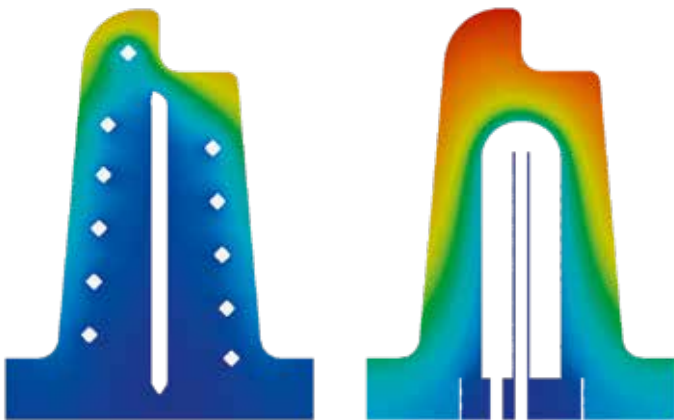
## CONFORMAL COOLING



- Close to cavity cooling
- Complex geometry spiral cooling possible
- Complex cooling channel cross section
- Any effective channel size
- Optimal cooling design from process simulation.

Typical Insert Example (Hot work tool steel H13, MS1, SS or Al inserts for plastics moulding or die casting)

## CONFORMAL VS CONVENTIONAL COOLING

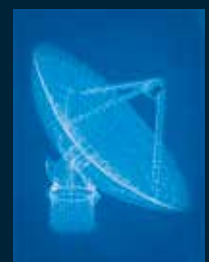
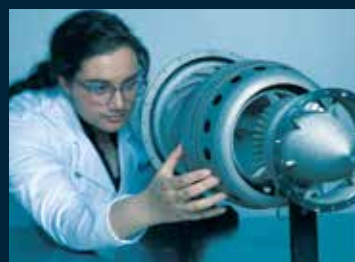


## OUR RECENT TOOLING PROJECTS

- Ultra-high temperature (glass) complex tooling for advanced high productivity construction material manufacturing
- Redesign, analysis and manufacture of die-cast tools using conformal cooling for a global automotive Original Equipment Manufacturer (OEM)
- Research and development project with Australia's government research agency to model conformal cooling performance on die casting tooling
- Research and development project on the thermal fatigue properties of additive-manufactured (AM) printed hot work tool steels.

## WE SERVE THE FOLLOWING INDUSTRIES:

Industrial companies  
SMEs  
Military and Defence  
Space  
Aviation  
Tool Manufacturers  
Injection Moulders  
Die Casters  
Automotive  
Customers with a pre-existing manufacturing process



# CURRENT MACHINE CAPABILITY

Amaero has access to some of the world's most advanced 3D printing machines.

Our machines include:



## AMAERO SP-100

Machine Model

100 x 80 mm  
(3.95 x 3.15 in)

Build Volume (x,y,z)



## Renishaw AM 400

Machine Model

250 mm x 250 mm x 300 mm  
(9.8 x 9.8 x 12 in)

Build Volume (x,y,z)



## EOSINT M 280

Machine Model

250 mm x 250 mm x 325 mm  
(9.85 x 9.85 x 12.8 in)

Build Volume (x,y,z)



## EOSINT M 290

Machine Model

250 mm x 250 mm x 325 mm  
(9.85 x 9.85 x 12.8 in)

Build Volume (x,y,z)



## AMAERO SP-500

Machine Model

500 mm x 250 mm x 250 mm  
(19.7 x 9.85 x 9.85 in)

Build Volume (x,y,z)



## Trumpf Trulaser 7040

Machine Model

4000 mm x 1500 mm x 750 mm  
(157.5 x 59 x 29.5 in)

Build Volume (x,y,z)



## EOS M 400

Machine Model

400 mm x 400 mm x 400 mm  
(15.75 x 15.75 x 15.75 in)

Build Volume (x,y,z)



## X LINE 2000R

Machine Model

800 x 400 x 500 mm  
(31.5 x 15.75 x 19.7 in)

Build Volume (x,y,z)



## X LINE 1000R

Machine Model

630 x 400 x 500 mm  
(24.8 x 15.75 x 19.7 in)

Build Volume (x,y,z)

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