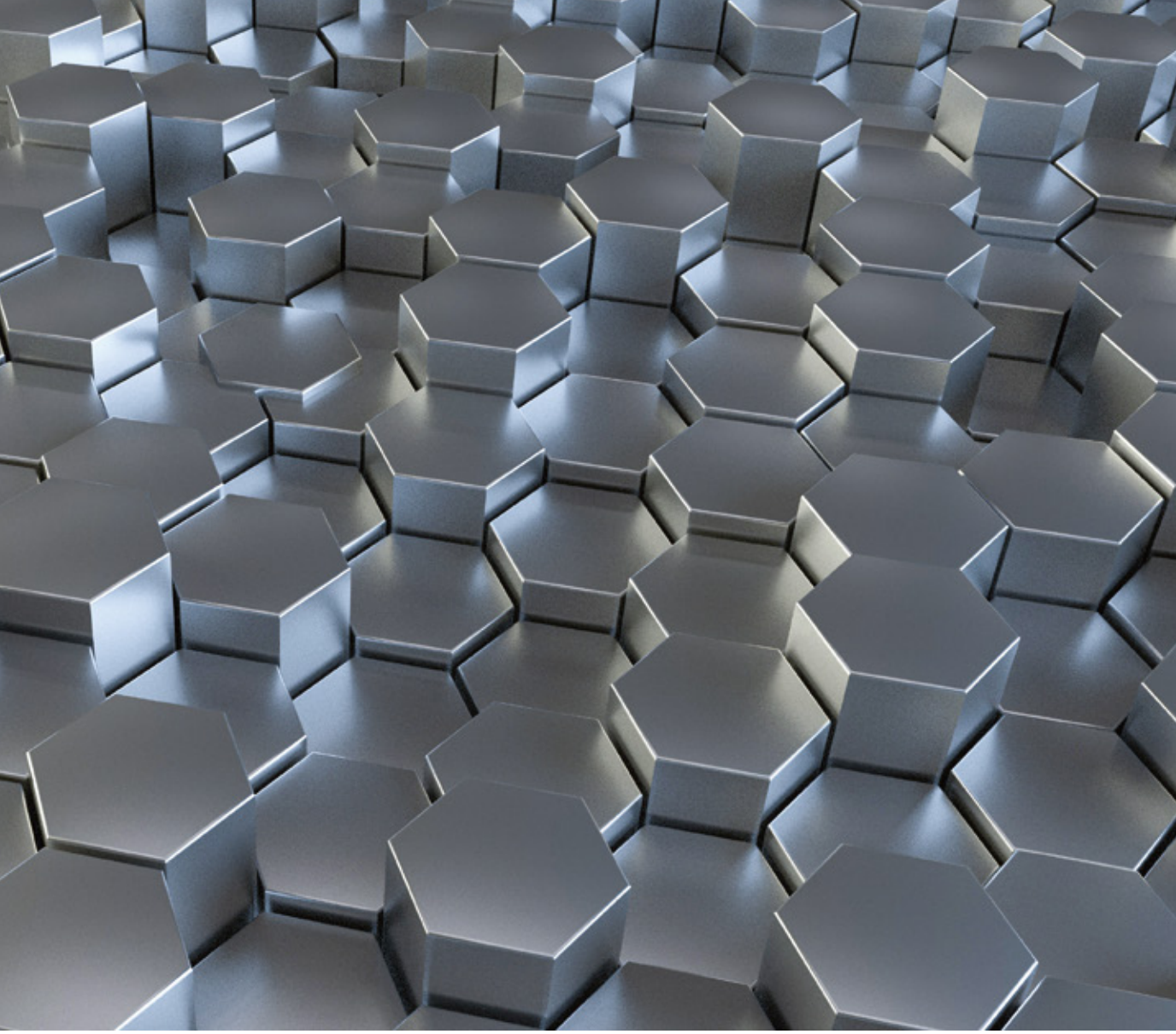

Mold Industry Solutions

Make Easier Manufacturing Make a Better World

BLT

Stock Code:688333.SH

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goengineer

General Description

The trend of high efficiency and cost reduction as well as intelligent manufacturing drives industrial transformation and upgrading.

3D printing technology can help mold production to reduce costs and improve quality, its main application points are: with the shape of the cooling channel, breathable process, lightweight, multi-material composite manufacturing, etc.

With the shape of the cooling channel can reduce the production cost and cycle time, and improve the product quality; breathable process solves the problem of gas trapping in plastic mold, and improves the product yield; lightweight design can significantly reduce the weight of the mold, and reduce energy consumption; multi-material composite process for the mold brings more design space.

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01 Industry Pain Points

1）Mold production efficiency matters

The long mold opening cycle, especially during the R&D pilot phase, seriously affects the R&D cycle, product batch production and market progress.

2）Production efficiency and quality matters

Molds with traditional processing have no cooling system or a simple cooling system, which results in low cooling efficiency and poor cooling uniformity. This kind of condition cannot achieve accurate control of the mold temperature field, resulting in long production cycles, product deformation and other quality problems. During the production of the mold, the cavity is prone to trapped air, which can lead to defects in that part of the product.

3）Labour matters

The traditional mold processing process, which involves a lot of manual labour, is facing an increasingly serious staff shortage as the manufacturing industry becomes less attractive to labour, and there is an urgent need to upgrade technology to reduce the dependence on manual labour in the processing chain.

4）Environmental matters

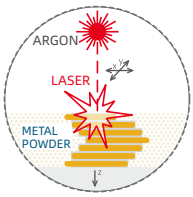
The traditional mold structure is a subtractive manufacturing, which consumes a lot of materials and resources and emits more carbon in the process of raw material production and processing, which does not meet the energy-saving carbon reduction of environmental trends.

02 Metal 3D Printing(PBF-LB/M Process) Solutions

1）PBF-LB/M process principle

Powder Bed Fusion — Fused with Laser —

PBF-LB/M
Laser-based powder bed fusion of metals Technology



By means of a movable laser beam, metal powder is selectively sintered locally in layers, thereby solidifying a cross-section of the component.

Based on the features of additive manufacturing, the technology can be applied on complex structural thermal management, medium management, lightweight, and other unknown functions and possibilities.

2）Material

◉ Building Materials: 18Ni300, 420, CX

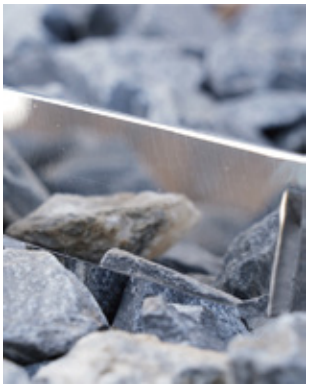
Material	Status	Tensile strength (σb/MPa)	Yield strength (σP0.2/MPa)	Elongation (%)	Section shrinkage (%)	Hardness (HRC)
18Ni300	Deposited State	1190	1110	14	55	36
	Heat Treated State	2000	1980	5	12	50
420	Deposited State	1770	1100	5	5	50
	Heat Treated State	1750	1450	8	12	55
CX	Deposited State	1110	960	12	45	38
	Heat Treated State	1720	1640	7	14	51

3）Process

Polishing Performance and Forming Efficiency

Process

- Based on the specific requirements of injection molded products, BLT has developed a special process for mold materials covering 18Ni300, 420 and CX, suitable for BLT-A300/A320, BLT-A400, BLT-A450 and many other types of machines.

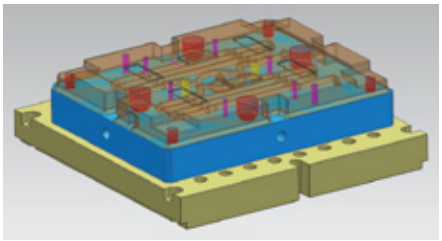


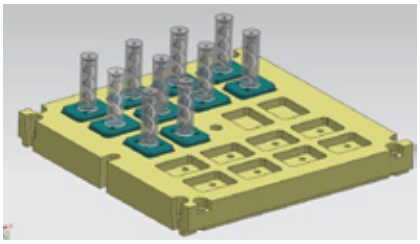
Effects

- Forming rates of 100g~130 g/h ;
- High density molds and good polish ability meet SPI-A1 standard and can produce transparent injection molded products.

Grafting

- The bottom part of the mold insert is machined, the upper part with cooling channel or exhaust structure is printed
- The Automatic Grafting Intelligent Module developed by BLT enables the positioning of both parts with an accuracy of better than ±0.1mm
- Significant savings in total costs and shortened mold production cycles

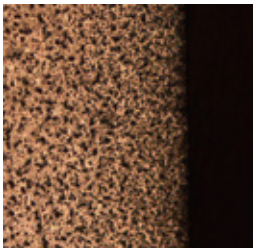




Breathable Process

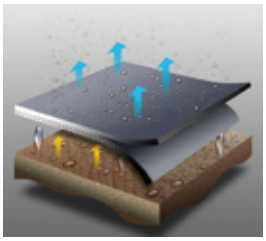
Process

- A large number of three-dimensional interoperable micro-pores are randomly distributed within the permeable steel tissue;
- Suitable materials are 420, CX and other types of stainless steel ;
- Pore size of the permeable micro-pores is 0.03-0.05mm.



Effects

- Due to the good breathability of the mold steel, the surface profile of the product is clear;
- It can effectively reduce the filling resistance;
- Reduce the clamping force of the molds;
- Reduces the weight of the mold and saves material.



In summary, it can simplify the design of the mold structure and the choice of injection molding machine and tool-casting machine models, the development and application of breathable metal materials can save materials and energy, which is conducive to the recycling of materials and environmental protection, and has a broad application prospect and far-reaching economic and social benefits.

Cooling Channel

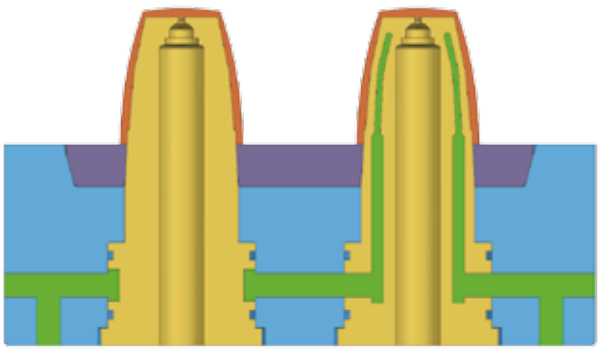
Application

As shown in the figure below, the application of additive manufacturing can be the perfect solution when the high mold temperature leads to quality defects and subtractive materials manufacturing can not increase the cooling system.

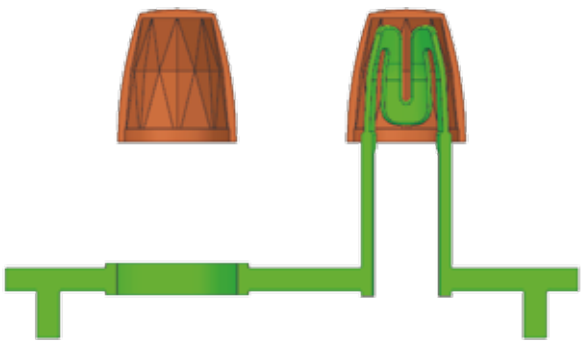
Effects

Increasing the cooling flow, equalising cavity temperatures and improving product yields.

Increasing cooling efficiency, shortening forming cycles and increasing productivity.



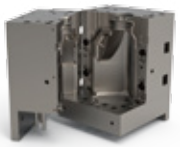
General Water Channel Shaped Water Channel



- Conventional water channels are not designed to achieve the optimum mold temperature.
- The shaped water channel fits perfectly into the mold cavity to achieve the optimum mold temperature.

03 Typical Cases

Injection Mold



Blow Molding Bottle Mold

Shoes Mold

Stamping Tire Mold

04 Industry Machines & Systems and Intelligent Modules

Industry Machines & Systems

BLT-A300/A320 ⋙

Supporting Materials

Titanium Alloy, Aluminum Alloy, Superalloy, Cobalt-chromium Alloy, Stainless Steel, High-strength Steel, Tool Steel, Copper Alloy

Build Dimension

250mm×250mm×300mm（W×D×H）

Laser Power

500W/1000W; 500W×2/1000W×2

BLT-S400 »

Supporting Materials

Titanium Alloy, Aluminum Alloy, Superalloy, Stainless Steel, High-strength Steel, Tool Steel

Build Dimension

400mm×300mm×400mm（W×D×H）

Laser Power

500W×2；500W×3；500W×5；500W×6

Intelligent Modules

- Scraper-jammed Self-repair
- Automatic Grafting Module
- Powder Spreading Quality Control
- BLT-MES System

05 Service System Focused on Industry Applications

Quality Assurance

After Sales Service

Training System

Technical Service

The technical terms used in this document is referenced from
《EN ISO/ASTM 52926 Additive Manufacturing of metals - Qualification principles》

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