InssTek
DMT® Metal 3D Printing Specialist

DMT® Metal 3D Printing

The way we go

Metal 3D Printing Leader

Laser-aided Direct Metal Tooling

2016

Oct. MX printer for material development was sold to a university in Germany

Sep. World's largest metal 3D printer sold
MX-Grand, the largest metal 3D printer in DED was sold to Europe

2015

Jun. Appointed as one of the most high-tech companies in Korea by Ministry of Science, ICT and Future Planning

Mar. Market entry into Japan
Sold MX-450 to a leading electronic company in Japan

2012

May. MPC development for medical application
Developed a customized system for porous coating for artificial hip & knee joint with approval from Ministry of Food and Drug

2010

Dec. Industrial application of DMT®
Succeed in industrial application of Direct Metal Tooling® (DMT)to home appliances and aerospace industries

2008

Sep. US, Japan and EPO Patents
Obtained patents of real-time monitoring and controlling the intensity of laser power

2007

Dec. Provided solutions with DMT® for automotive application

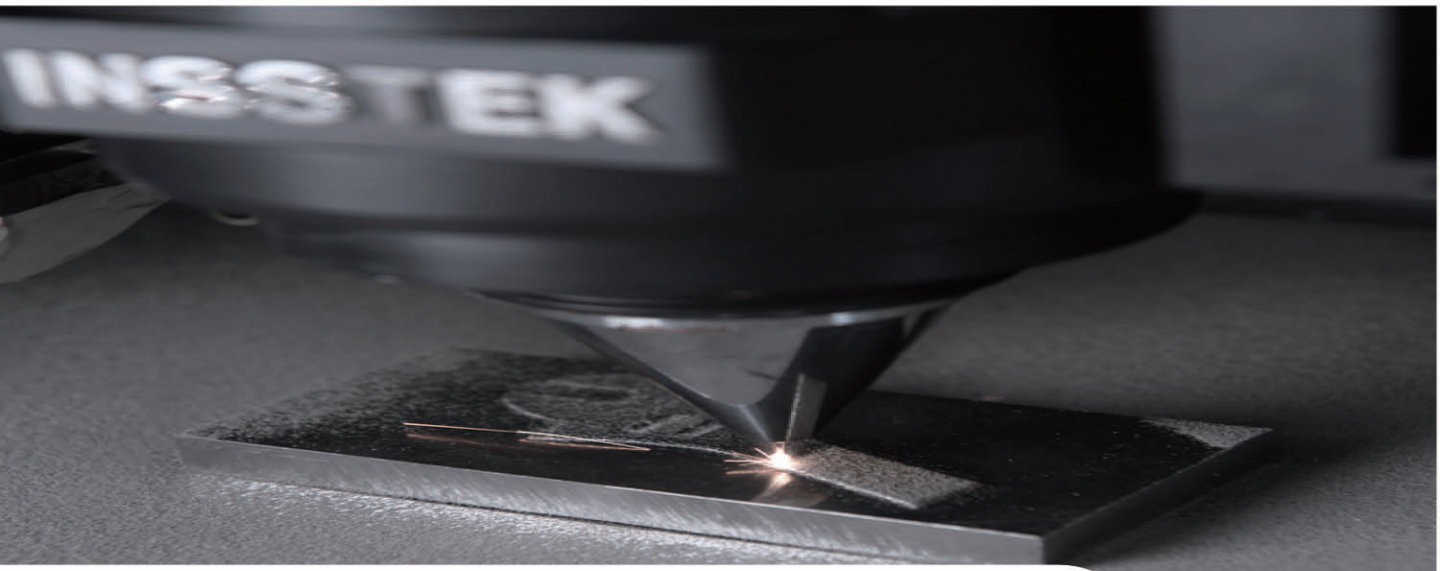
2003

Jun. Registration of DMT® trademark

2001

Nov. Completion of the standard DMT® 3D printer MX-1

Aug. Company Foundation
InssTek was established with metal 3D printing technologies for the 1st time in South Korea



We offer customer-oriented systems and services

Metal 3D Printing Systems

Standard Model
MX-250
MX-600
MX-1000
MX-Grande

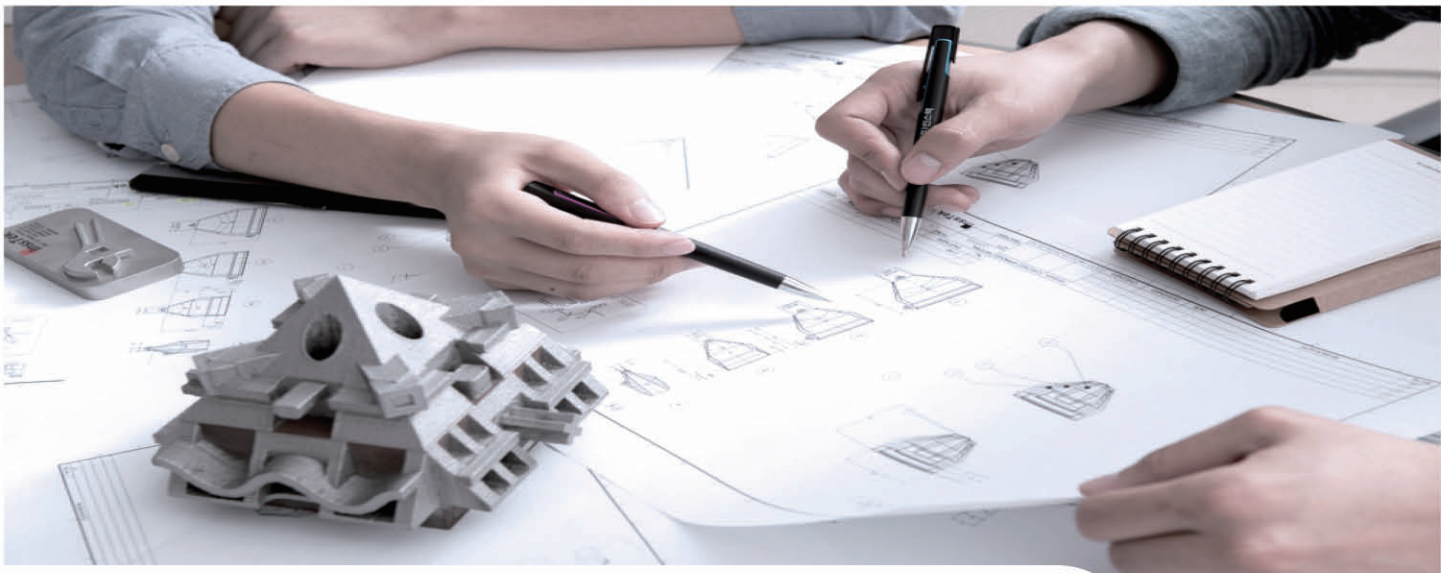
Custom Model
MPC

*MPC: Machine for Porous Coating

Services

Manufacturing, Remodeling, and Repair:

- 3D conformal cooling channels for mold and die cores
- High-performance multi-metal parts
- Repair of damaged molds and machine parts
- Special porous coating and surface modification
- Large-scale parts fabrication



Creating innovative solutions for challenges in industries

Examples of industry applications

Home Appliance

A fan mold made by 3D cooling channels: Improvements in cooling efficiency and noise reduction

Aerospace & Defense

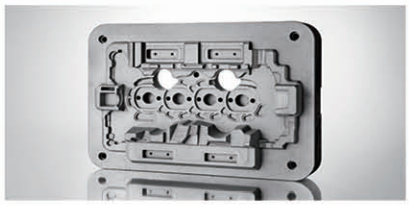
Air seal repair: cost reduction and life cycle enhancement compared to the original

Medical

Porous coating of artificial hip joint: Reduction of delivery & cost, and functional enhancement

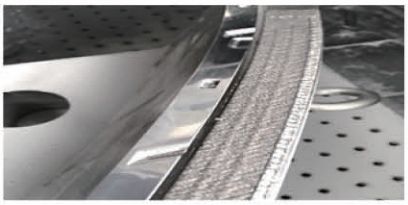
Aerospace & Defense

Jet engine part repair: longer life cycle and reduction of delivery time



Automotive

30% life cycle enhancement by printing corrosion-resistant material



Automotive

Headlamp mold remodeling: lead-time improvement and cost reduction

DMT®
Direct Metal Tooling, the most precise DED technology

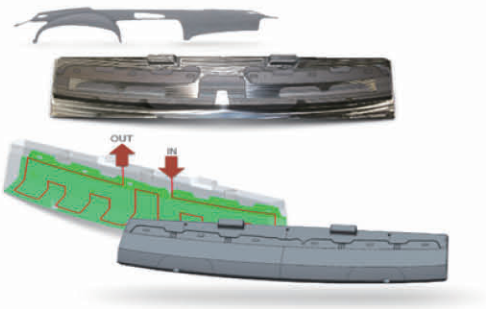
Features

- Highly functional component production, re-modeling, repair and special coatings
- Excellent mechanical properties
- Using commercially available metal powders
- Enables to manufacture of complex shapes structure
- Enables to repair parts without original CAD or CAM data

3D conformal cooling channels

Manufacturing complex shapes with quality enhancement

Applying 3D cooling channels by DMT® can not only manufacture complex shaped 3D printed parts but also significantly improve quality.



Dashboard Mold

Advantages

- Solving corrosion and blockage problem
- Reducing thickness variation and bubbles rise
- Reducing production cycle times

Industry application

Plastic injection molding, die casting, hot-stamping and mass production

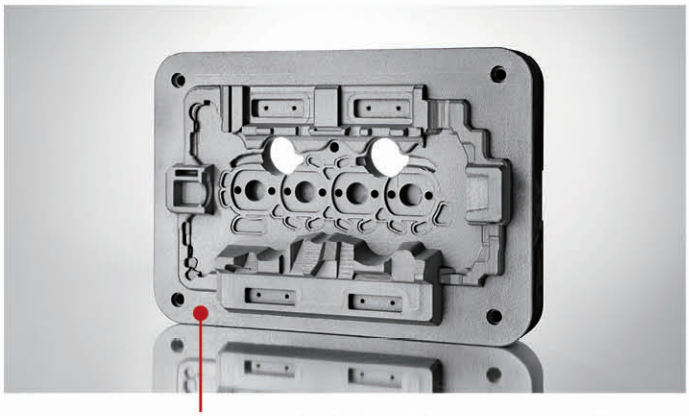
Multi-metal 3D Printing

DMT® enables multi-material 3D printing

Multi-material 3D printing can maximize performance through wear resistance, heatproof, and thermal conductivity enhancement.

Advantages

- Cost reduction by depositing alloys to the right place where functional properties are required
- Able to apply for a new concept product development
- Functionally gradient materials that enables to have high density and excellent mechanical properties



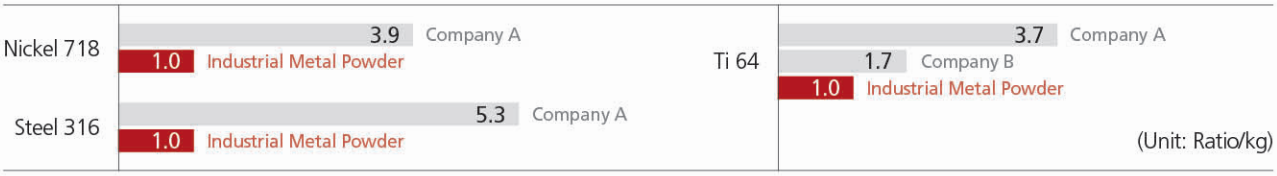
Automotive engine cylinder head low pressure mold

Using industrial metal powders

We use commercially available metal powders.

Price comparison by metal powders

Customers can reduce material cost by three to five times when compared with other metal 3D printing companies.



Metal powders by alloy class

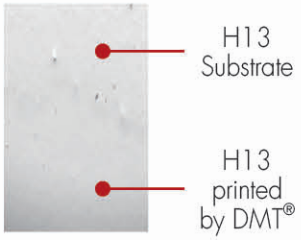
Steel	P20, P21 (DIN 1.2311)
	H13 (DIN 1.2344)
	D2 (DIN 1.2379)
	304 (DIN 1.4301, 1.4303)
	316 (DIN 1.4401, 1.4436)
	420 (DIN 1.4021, 1.4007)
Copper	Al Bronze (DIN 2.09XX)
Titanium	CP Ti (DIN 3.7024)
	Ti-6-4 (DIN 3.7164/3.7165)

Nickel	713
	718 (DIN 2.4668)
	738
	Hastelloy X (DIN 2.4665)
Cobalt	CoCr
	Stellite 6
	Stellite 21 (DIN 2.4979)
	Stellite 25

- Powders are supplied from Advanced Powders & Coatings, Inc., Sandvik Osprey Ltd., Carpenter Technology Co., Praxair Technology, Inc., and so on.
- Able to use metal powders from other producers as well.

Excellent mechanical properties

Printing metal parts by DMT® has superior mechanical properties, high density and fine microstructures.



Materials			UTS (MPa)	YS (MPa)	Elongation	Hardness (HRC)
H13 (SKD 61)	DMT®	Vertical	1,927	1,400	5%	54
		Horizontal	1,998	1,477	5%	
	Forging Part		1,821	1,385	9%	51

*The data represents the condition with no heat treatment

Standard Model

MX-250
Entry level for R&D

Laser

500W
Optional laser power

DMT® Motion

3Axis or 5Axis
A/C, Tilt & Rotation
• A & C Axis :-100° up to +5° / 360° (5 axis)
•Tilt & Rotation : ø250 (mm) (5 axis)

Working Envelope(mm)

250 x 250 x 250

Weight(kg)

3,400

DMT® Module

Standard DMT Module 500 (or SDM 800)

MX-600
Small-mid sized printing

Laser

1 kW Ytterbium fiber laser
Optional laser power

DMT® Motion

3 or 5 Axis
A/C, Tilt & Rotation
• A & C Axis :-100° up to +5° / 360° (5 axis)
•Tilt & Rotation : ø350 (mm) (5 axis)

Working Envelope(mm)

450 x 600 x 350

Weight(kg)

4,500

DMT® Module

Standard DMT Module 800 (or SDM 500, 1200)

MX-1000
Mid-large sized printing

Laser

2 kW Ytterbium fiber laser
Optional laser power

DMT® Motion

3 or 5 Axis
A/C, Tilt & Rotation
•A & C Axis :-100° up to +5° / 360° (5 Axis)
•Tilt & Rotation :ø450 (mm) (5 Axis)

Working Envelope(mm)

1,000 x 800 x 650

Weight(kg)

8,000

DMT® Module

Standard DMT module 800 (or SDM 500, 1200)

*Software: Magics for InssTek CAM software for DMT process only
*Options: DMT® closed loop feedback Control System, auto-tracking system with semi teach-to learn function, up to 3 additional powder feeding systems can be added

MX-Grande

The customized DMT® metal 3D printer that is designed and manufactured for customers' large scale printing.

Laser

3 kW Ytterbium Fiber Laser

DMT® Motion

6 Axis Motion
Working Area: 4,000 X 1,000 X 1,000 (mm)
A & C Axis :-100° up to +5° / 360°
Tilt & Rotation : ø450 (mm)
U Rotation Motion: max 25 RPM / ø650 (mm)

Control System

PC-based Control System with 17" Touch Screen

Weight(kg)

17,000

DMT® Module

Standard DMT module 1200

Optional

DMT® closed loop feedback control system
Auto-tracking system with semi teach-to-learn function
Up to 3 additional powder feeding systems can be added

Custom Model

MPC for Medical Application

MPC (Machine for Porous Coating) is developed to apply for orthopedic implant surface coating. The system is currently being used for artificial knee & hip joint coating.

Laser

500W Ytterbium Fiber Laser

DMT® Motion

6 Axis (XYZ Linear Gantry Optional)
- A & C Axis : -100° up to +5° / 360°
- No. of Tilt & Rotation : 4 Set

Control System

PC-based Control System with 17" Touch Screen
Self-calibration System for Power feeding rate
Nozzle Self-cleaning System

Weight(kg)

3,000

Software

MX-OS

DMT® Module

Standard DMT module 800

Optional

Up to 3 additional powder feeding systems can be added

Complex product manufacturing and supply chain simplification

Our services include:

- Manufacturing
- Remodeling
- Repair

Manufacturing

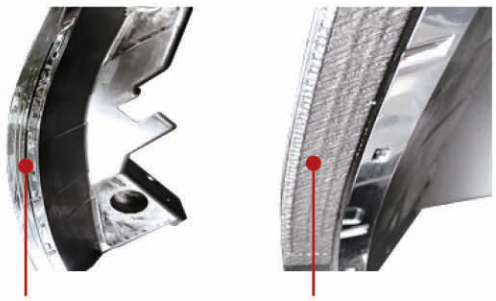
DMT® metal 3D printers enable manufacture of high-performance and multi-material parts that are composed of two or more different alloys.

- Extending product life cycle
- Reducing manufacturing cost
- Manufacturing complex shaped parts
- Applied for new product development such as thermal conductive molds

Remodeling

Remodeling by DMT® technology enables enhancement of operational effectiveness including low cost and time reduction.

- Using reverse engineering to repair molds
- Removing unnecessary shapes and remodeling molds
- Able to apply to large-sized test jobs



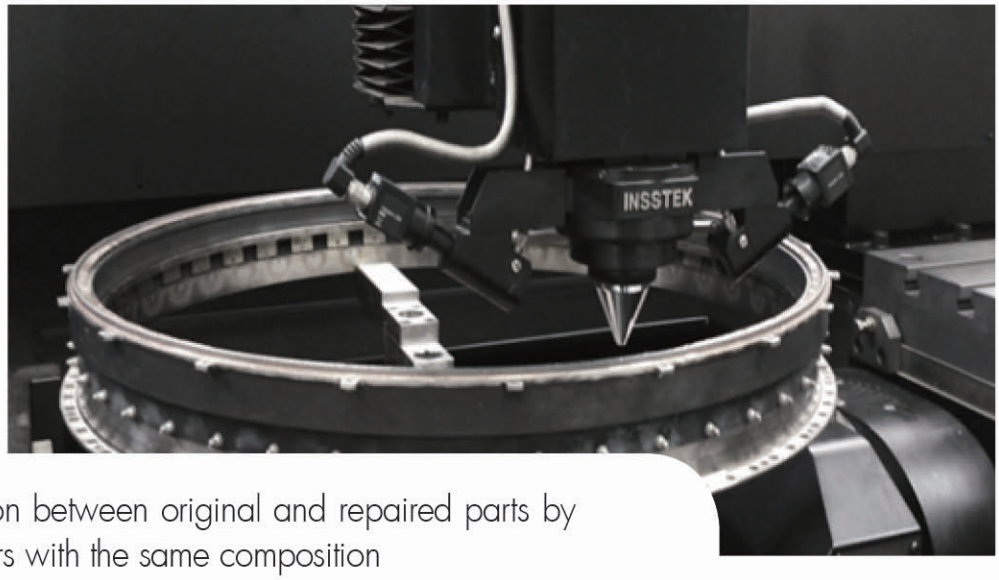
Mold Remodeling: 2 to 4 stripes

Headlamp Mold Remodeling

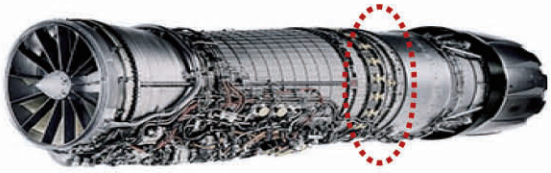
- It was originally required to manufacture new mold for headlamp
- Remodeling by DMT® metal 3D technology
- Customer could have operational effectiveness:
  - Lead-time simplification
  - Material cost reduction

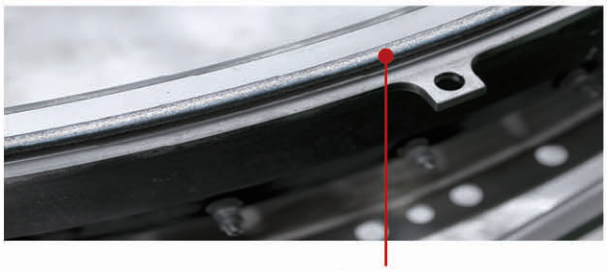
Repair

Mechanical properties of repaired parts are same as or superior to original.



- No visual distinction between original and repaired parts by using alloy powders with the same composition
- Have better mechanical properties compared to original parts
- Using 'Auto-tracking' technology to repair damaged parts without CAD/CAM data





Repairing worn our part of F110 engine

Repairing F110 engine part of F-15K for Korea Air Force

- Extended life cycle of jet engine part by DMT® metal 3D technology
- Printed with multi-materials to gain better mechanical properties
- Lead time and cost reduction

InssTek
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InssTek, Inc.
154 Sinsung-ro, Yuseong-gu, Daejeon, Republic of Korea, 34109
Phone +82 42 935 9646
Fax +82 42 935 9649

sales@insstek.com
For information about partners, visit: www.insstek.com