

# Foundry 3D Printing

Industrial Application Solution

KOCEL INTELLIGENT MACHINERY LIMITED



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## COMPANY INTRODUCTION

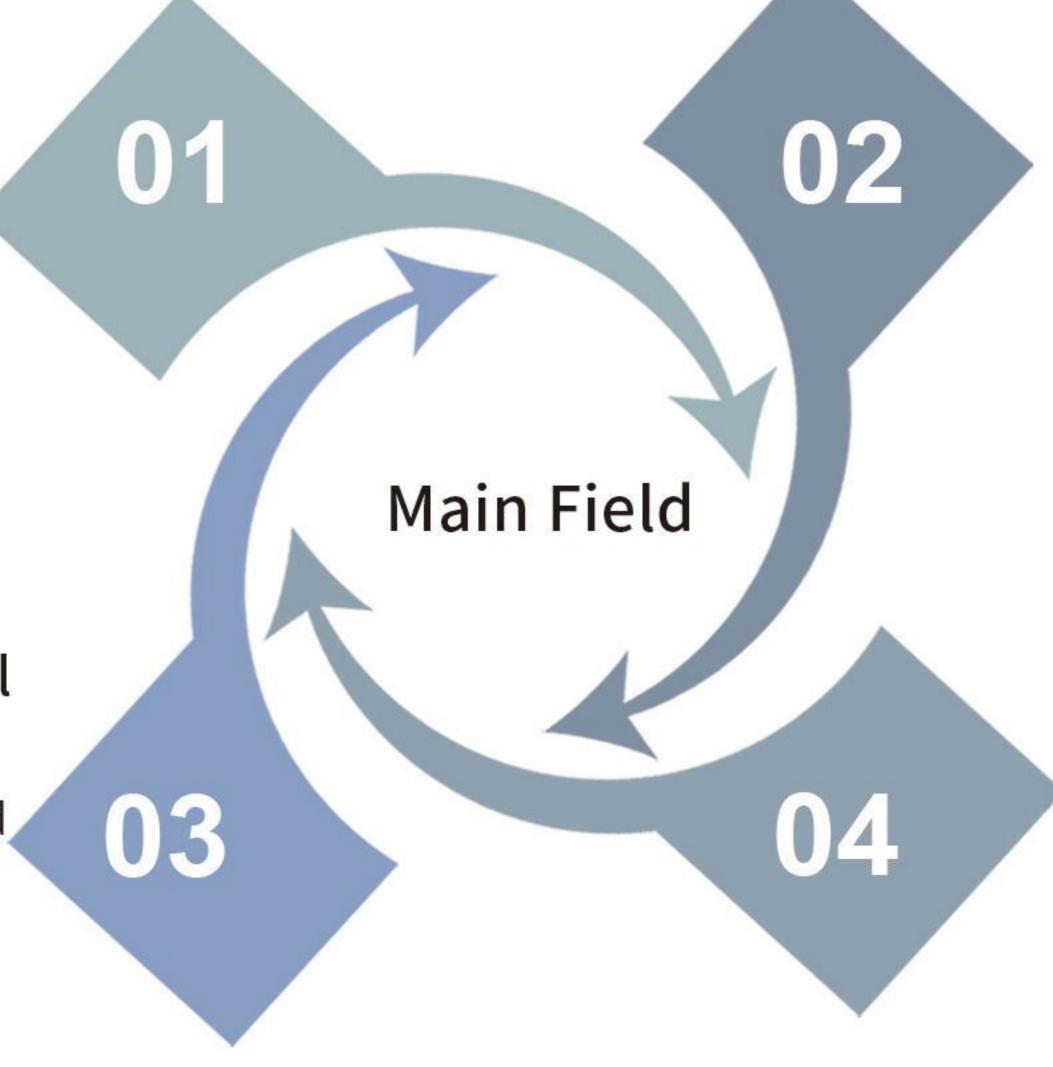


Word Leader of Casting 3D printing industrial application

Casting 3D printing equipment sales, research and development, manufacturing, after-sales; 3D printing digital factory construction.

# Industry-leading of 3D printing cultural and creative applications

Provide a complete set of solutions for the production and manufacturing of customized architectural decoration, municipal landscape, figure statues, precise terrain sand table, and complex openwork products.



#### World-calss of Metal Binder Jetting 3D printer

Binder jet metal 3D printing equipment sales, research and development, manufacturing, after-sales; 3D printing digital factory construction.

# Independent R&D of 3D printing power and chemicals

Chemicals: Inorganic binder, phenolic binder, metal binder; Powder: Quartz sand, ceramic sand, alumina, other kinds of metal powder. Kocel Intelligent Machinary Limited (Hereinafter referred to as the company) was established in 2008, the leading business include binder jet casting, metal, ceramic 3D printing equipment R & D and manufacturing, 3D printing digital factory construction, 3D printing products and services. It is a national high-tech enterprise and a national special and specialized "little giant" enterprise and a national green factory.

Since 2012, the company has successively set up a casting 3D printing team of more than 300 people, investing more than 1 billion yuan, focusing on the application research of casting 3D printing industrialization. Since industrial production, company has provided nearly 200,000 tons of sand molds and 100,000 tons of castings, and has more than 500 customers, involving military, aerospace, automotive, engineering machinery, compressors, robots, motors, transmissions, machine tools, hydraulics, molds and many other fields.

## Superiority



#### Comprehensive industrial application platform

Including various material R&D, equipment R&D, IoT and remote O&M, industrial Internet, intelligent factory, industrial software, etc.



#### Comprehensive integration technology of the whole industry chain and smart factory

Company has R&D and manufacturing ability of 3D printing, robot and intelligent equipment, supporting facilities and software integration development. Integration with intelligent unit systems 3D printing production lines and digital factories.



#### Casting industry chain coverage

Material, design, process, casting, machining, servise, etc.



#### 3D printing service

It has 3D printing applications (sand, metal, ceramics, cultural and creative, etc.) and rapid casting capabilities.



#### Remote marketing and O&M center

Marketing, manufacturing and remote O&M center located in multiple countries and regions.



### **XOCEL AJS 150,500**

Laboratory printer for college: Design for college, R&D institutions for research, education and presentation.

#### **Features**

Unattendance	Convenient installation,pnp,one click print; Remote O&M	High efficiency	Sand laying and printing alternately;
High quality	ISO 9001 certificate Key components(electrical motor, guide rail,lead screw,linear guide) come from international brand; Intergrated machining of frame, high mechanical precision;	Low cost	Local raw material (sand and chemicals); New sand, recycled sand and regenerated sand applicable; AC 220V, no compressed air required;
Environmental friendly	AC environment, low noise, no dust;		

#### **Printer parameters**

Type	KOCEL AJS 150	KOCEL AJS 500	
Molding size (mm)	150×100×100	500×400×300	
External dimensions (mm)	600×550×500	2080×1900×1850	
Printhead resolution (dpi)	300	400	
Building rate (L/h)	0.3~1.2	8-20	
Layer thickness (mm)	0.1-0.32	0.2-0.5	
Precision (mm)	±0.3	±0.3	
Weight (t)	0.05	2	
Solid material	Quartz sand, ceramic sand, etc		
Liquid material	Furan, phenolic, inorganic		
Printing file format	STL		





### **XOCEL AJS 1200, 1800**

Industrial R&D machine: facing military, aerospace, automobile, etc. For new casting and small batch casting's R&D and manufacturing.

#### **Features**

Unattendance

One click print;

Remote O&M;

Equiped with equipment and process quality knowledge base system;

Low cost

ISO 9001 certificate

Key components(electrical motor,
guide rail,lead screw,linear guide)
come from international brand;
Intergrated machining of frame,
high mechanical precision;

Environmental Equipped with VOC; friendly AC environment, low noise, no dust;

### **Printer parameters**

**High quality** 

Туре	KOCEL AJS 1200	KOCEL AJS 1800	
Molding size(mm)	1200×1200×750(单箱)	1800×1000×700	
External dimensions(mm)	9400×3100×2750	11200×3200×2800	
Printhead resolution(dpi)	400	400	
Building rate(L/h)	30-85	50-120	
Weight(t)	12	15	
Layer thickness(mm)	0.2-0.5		
Precision(mm)	≤±0.3		
Solid material	Quartz sand, ceramic sand, etc		
Liquid material	Furan, phenolic, inorganic		
Printing file format	STL		

,----Work box A ,---- Mixing System ,---- Control Panel Local raw material (sand and chemicals); New sand, recycled sand and regenerated Laying and printing system sand applicable; 2 jobbox alternately printing; ,----Work box B Equipped with industrial firewall software and hardware; Equipped with UPS; (G) KOCEL 共享 Equipped with light curtains, security locks, etc AJS 1800



### **XOCEL AJS 2500,4000**

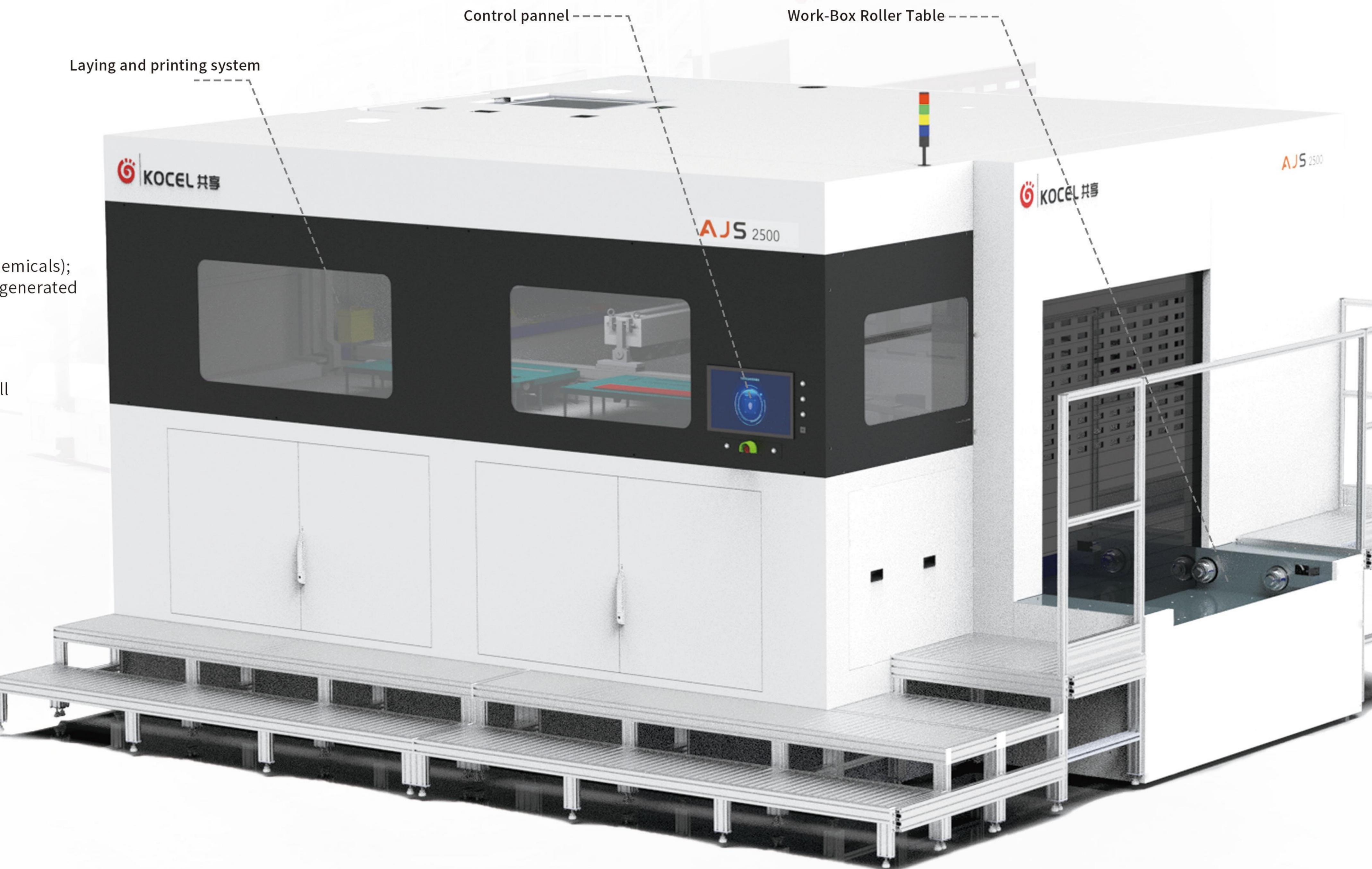
Industrial application type: facing military, aerospace, automobile, etc. Equipped with supporting facilities and industrial robot, forming digital factory, achieve high-volume production.

#### **Features**

Unattendance	One click print; Remote O&M Equiped with equipment and process quality knowledge base system;	High Efficiency	Follow type printing, twice efficiency;
High quality	CE,ISO 9001 Approved; International Brand Key part(such as motor,guide,ball screw,modules); Machining Wholistic Frame,High precision;	Low cost	Local raw material (sand and chemicals) New sand, recycled sand and regenerate sand applicable; 2 jobbox alternately printing;
Environmental friendly	Equipped with VOC; AC environment, low noise, no dust;	Safty	Equipped with industrial firewall software and hardware; Equipped with UPS;

#### **Printer parameters**

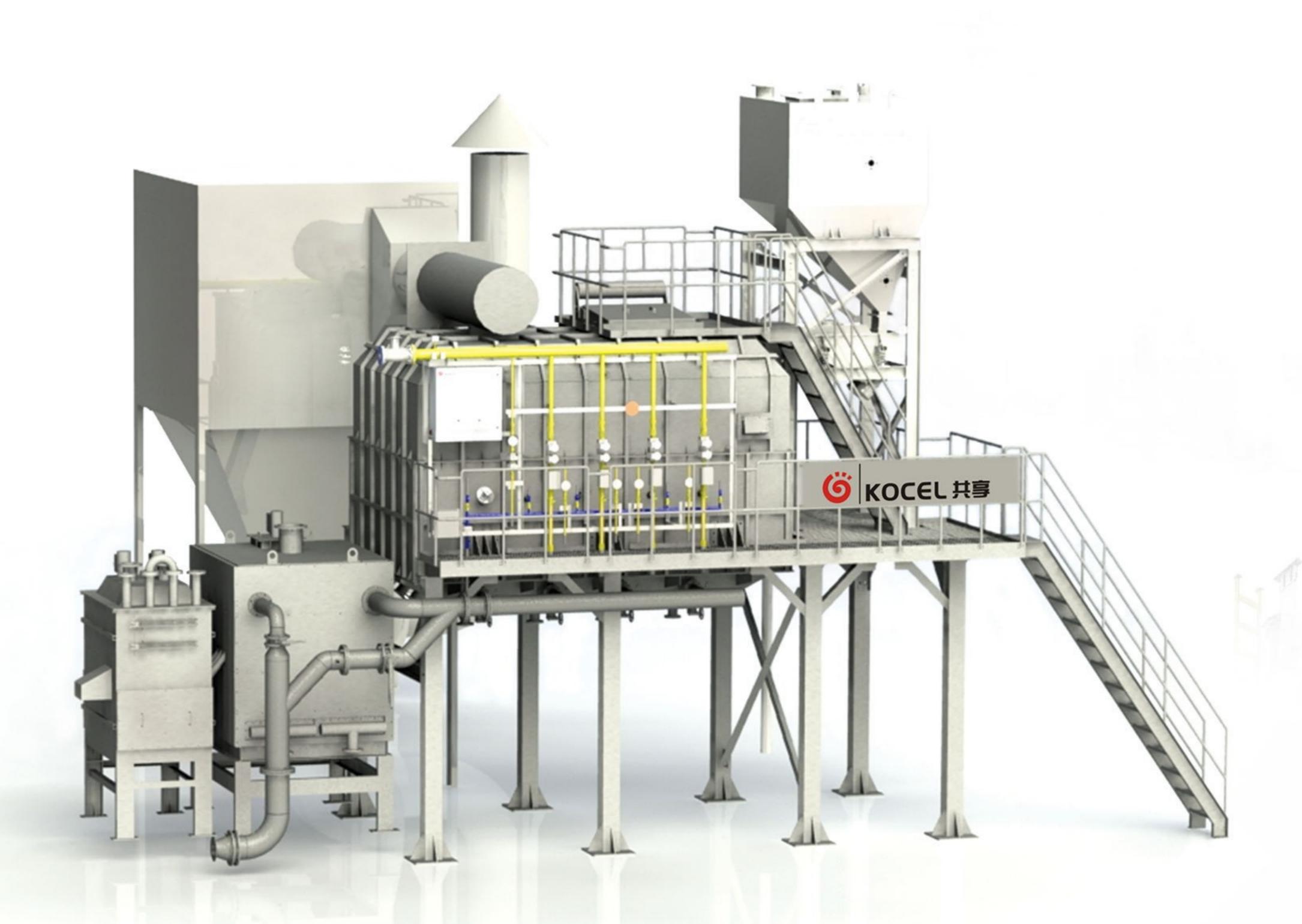
Туре	KOCEL AJS 2500	KOCEL AJS 4000	
Molding size(mm)	2500×1500×1000	4000×2500×1500	
External dimensions(mm)	6100×5800×3300	7800×6500×6200	
Printhead resolution(dpi)	400	400	
Building rate(L/h)	160-400	1000	
Weight(t)	30	65	
Layer thickness(mm)	0.2-0.5	0.2-0.5	
Precision(mm)	±0.35	≤±0.5	
Solid material	Quartz sand, ceramic sand, etc		
Liquid material	Furan, phenolic, inorganic		
Printing file format	STL		





## Ancillary equipment for casting 3D printing digital factory

Company has the manufacturing and supporting capabilities of casting 3D printing, robots and other intelligent equipment and software development integration capabilities, and comprehensively promotes the industrialization application mode of stand-alone to 3D printing production lines and digital factories



#### Thermal regeneration system

TR 100、TR 1000、TR 3000、TR 5000、TR 8000
For regeneration of resin sand, coated sand and other casting waste sand.

Sand handling capacity (t/h)	0.1/1/3/5/8
Gas consumption (m³/t)	≤25
Mud content (%)	≤0.2
Ignite loss (%)	≤0.2
Outing sand temperature (°C)	≤40
Solid particle emission standards (mg/m³)	≤10

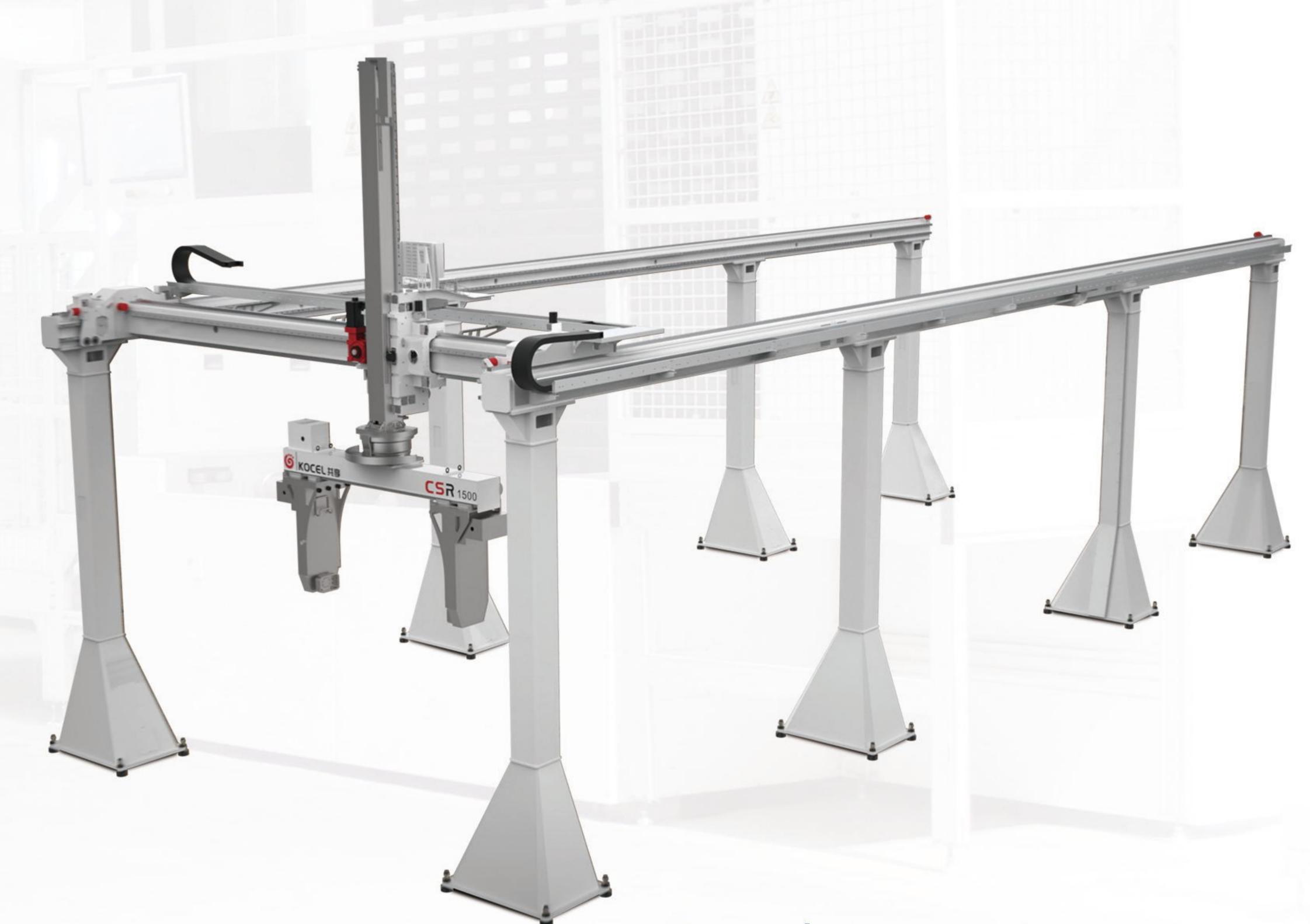


### Heavy load AGV

MRL 10、MRL 15、MRL 100

Heavy-duty back-mounted AGVs for the handling and storage of large-tonnage materials.

Rated load (T)	10-100 (Optional)
Lifting height (mm)	≥100
Positioning accuracy ( mm)	± 10
Max climbing capacity (%)	5
Full loaded and unloaded speed (m/mi	n) >20/30
Battery(V/Ah)	Lithium battery48/600 (Optiona



**Truss robot** 

> CSR 500, CSR 1000, CSR 1500, CSR 3000

For material sequencing, material handling, material turning, etc. of production lines.

Туре	CSR 500	CSR 1000	CSR 1500	CSR 3000
Grabbing weight (kg)	500	1000	1500	3000
Horizontal axis speed (m/min)	100	60	30	20
Repositioning accuracy (mm)	±0.1	±0.3	±0.5	±0.5



# INDUSTRIAL APPLICATION SOLUTIONS

Casting 3D printing digital factory/3D printing production line

Kocel has built over 20 3D printing production line/6 digital factory.



Ningxia·Yinchuan The World's First 10,000-ton Casting 3D Printing Factory



Anhui·Wuhu

The first 3D printing high-end parts rapid manufacturing full-process intelligent factory in the Yangtze River Delta



Fujian·Quanzhou

Casting 3D printing full workflow intelligent factory



Yunnan·Yuxi Yunnan Taibiao CNC Machine Tool Co., Ltd. 3D printing intelligent factory



Sichuan·Chengdu An enterprise in southwest China casting 3D printing intelligent factory



# THE INTERNATIONAL FIRST-RATE IN BINDER JETTING 3D PRINTING

## **XOCEL AJM 160, KOCEL AJM 500, KOCEL AJM 800**

The equipment uses stainless steel, copper alloy, tungsten alloy and other materials, which are used in aerospace, military, automotive, electronics, new energy, semiconductor and other industries.

#### **Features**

One click printing; Intelligent Unattended; Remote O&M;

High quality

High precision; Key components come from international brand

Environmental Low noise; friendly

VOC equipped;

#### **Parameter**

Туре	AJM 160	AJM 500	AJM 800
Application fields	Research and development, training, display	Industrialized application and mass productio	
External size (mm)	1200x1000x1400	2300x1800x2400	2700x2000x2700
Molding size (mm)	160x65x65	500x360x300	800x500x400
Max. resolution (DPI)	800	1200	1200
Layer thickness (mm)		0.03-0.2	
Printing precision (mm)	0.05-0.2		
Applicable material	<ul> <li>Metal materials: Iron-based materials, superalloys, copper, etc</li> <li>Composites: Copper tungsten, silicon carbide/aluminum, etc</li> </ul>		
Particle size (µm)	2-100	5-100	5-100





## 3D PRINTING SERVICES

## Casting 3D printing rapid manufacturing solution

Based on the rapid manufacturing solution of 3D printing process, company has provided hundreds of products, more than 200,000 tons of sand mold, more than 100,000 tons of casting.

gas volume: minimum 8ml/g

Compressive strength: 4-8MPa

raw sand: silica sand & ceramic sand process: casting + processing material: black & colored Cycle: 7-25 days Surface roughness: up to Ra12.5um



Impeller

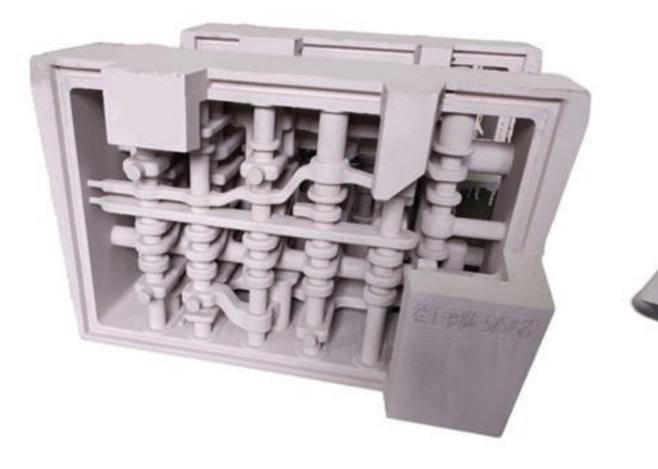
Multi-way valve









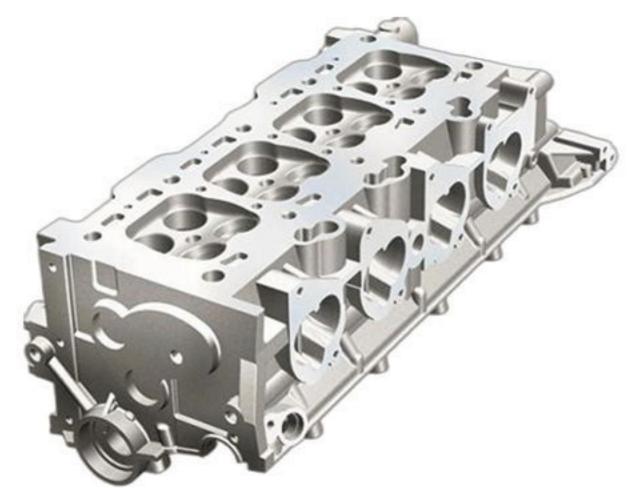








Turbine Runner Sand Core









Shell of new energy motor

New energy gearbox

## Binder jetting metal printing service

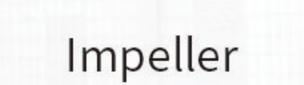
Kocel can provide 3D printing products in stainless steel, bowl alloy, tungsten alloy, copper alloy, superalloy, composite materials, ceramics and other materials. High printing efficiency, low overall cost, wide range of materials.







Conformal waterway injection mold





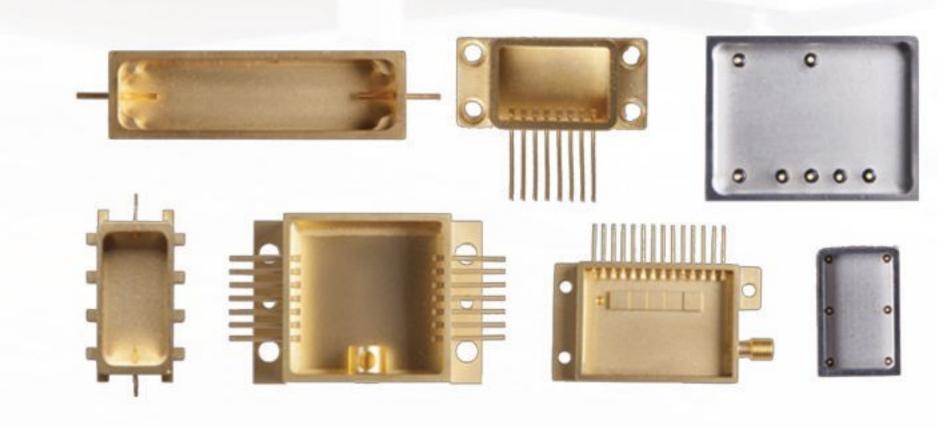
Artcraft



Nozzle







Rotor end rings

Heat exchanger

Electronic sealing bag

Aluminum alloy cylinder head Aluminum alloy cylinder block



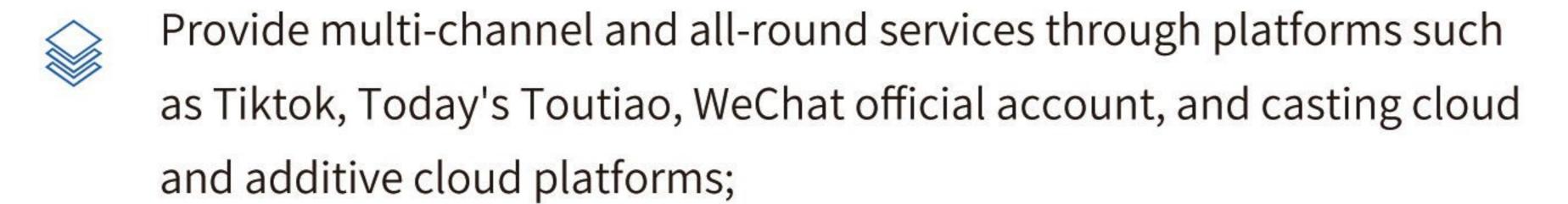
# ART CRAFT 3D PRINTING SERVICE

### **3D Printing Workshop**

We provide product design, modeling, scanning, printing, and personalized customization services for industries such as architectural decoration, sculpture, advertising, and cultural creativity. We provide solutions for the production of customized character sculptures, precise terrain sand tables, and complex hollow out products, with products and services covering all parts of the country.



National layout (Yinchuan, Wuhu, Jingjiang, Quanzhou, Weifang, Huizhou, etc.);



Having the ability to provide full 3D printing industry chain services (design, modeling, scanning, materials, industry, printing, services, etc.);

#### Product performance

Water absorption rate (%)	0.3
Moisture expansion rate (%)	0.02
Thermal conductivity coefficientw/ (m·k)	0.247
Bending strength (saturated)MPa	33.8
Impact resistance	No cracks
Resistance to dry and wet conditions	0.945
Aging durability (years)	≥30





# GLOBAL MARKETING & REMOTE MAINTENANCE CENTER

There are 3D printing marketing and production and remote O&M centers in many countries and regions around the world China: Yangtze River Delta, Bohai Rim, Central China, Pearl River Delta, Southwest Overseas: Japan, Austria





## TYPICAL CUSTOMERS

Kocel has more than 500 customers, involving military, aerospace, automotive, engineering machinery, compressors, robots, motors, transmissions, machine tools, hydraulics, molds, cultural and creative fields and many other fields.



























































