

000 000 000000 00 00 0000 0000 00 000000 0000 0000, 0000 00 0 0 0000 00 0000 00 00 00 00 000000. 0 00 00 000 00 0000 000000. 000000 00 00 00 0000 3D 0000 000000. 00 QBH 00, 0 0000, Galvo 0000 0 F-Theta 00 0000 0000 00. (**F-theta** 00 00 00 00 00 0000)

QBH 00 0000 00 0000 00 00 0000 00 (00 00 000000 00), GALVO 00000 0 00 0 00000 00000, F-Theta 00 0000 00 00 0 0 0000 0000 0000 00 000000.

00 00 :

(1) 00 0000 00 0000 1.5 00 00000 0000 93 % 0000 00 00 0 0 00000.

(2) 0000 00 0 0 0 00 0000 00000,

00 00 <20ppm. 00 00 00 00 2000W 00 0000 00 0000 50J / cm20000.

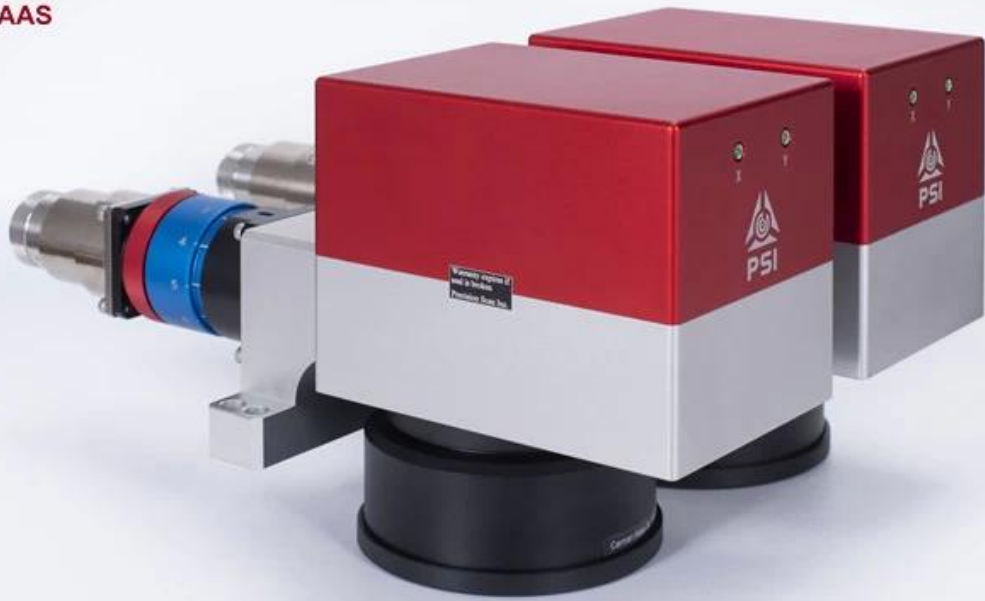
(3) 00 00 0000 00 000000 95 % 00 000000.

(4) 00 00 00000 0000 000000 00 00 00000 00000 M2 <0.040 0000 0000 000000.

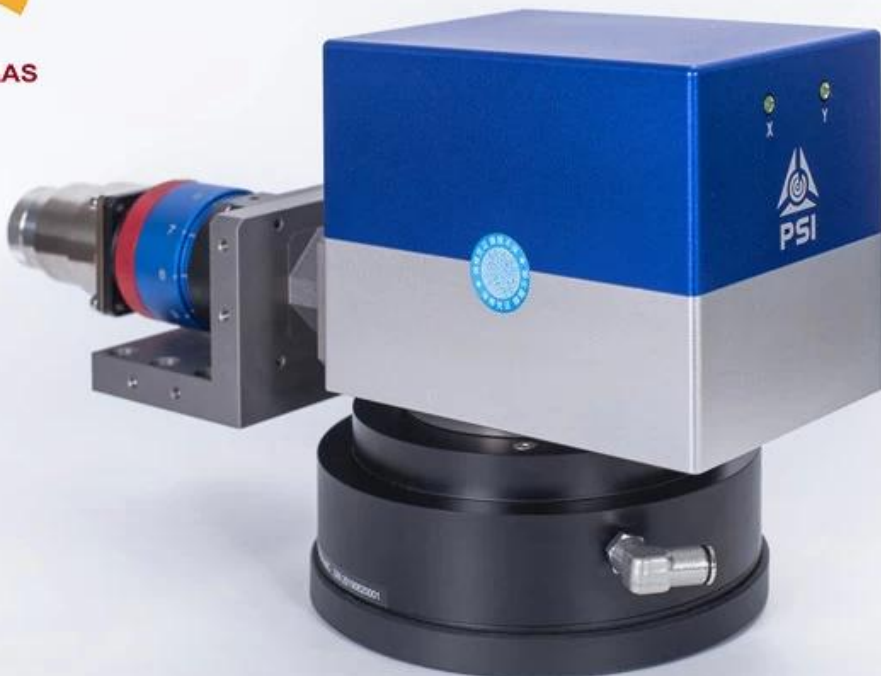
(**3D** 00 00 00 00 0000)

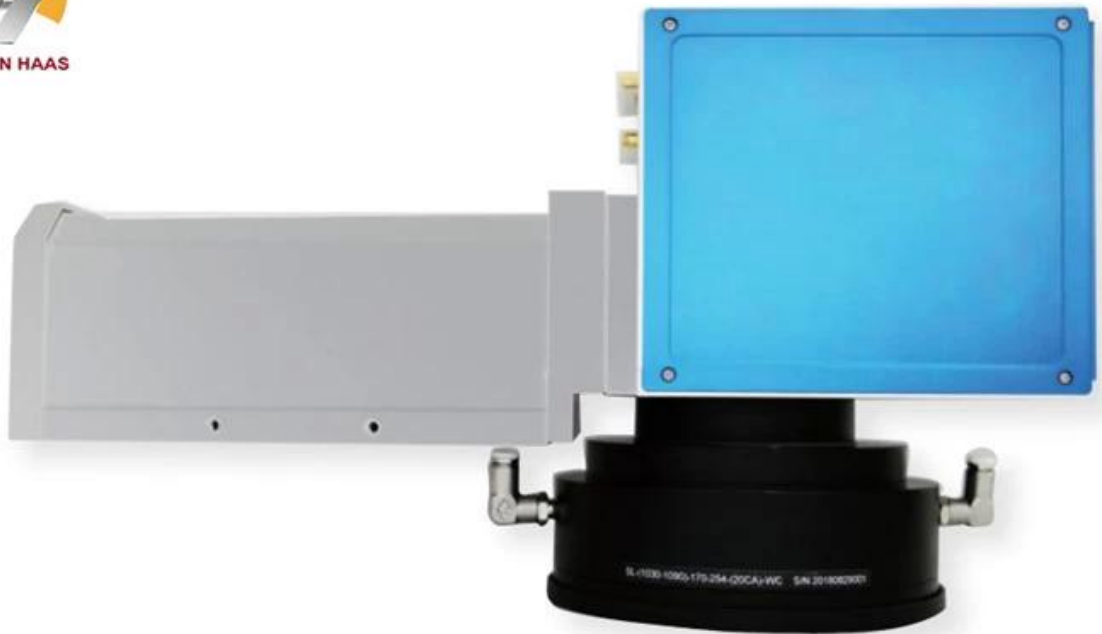
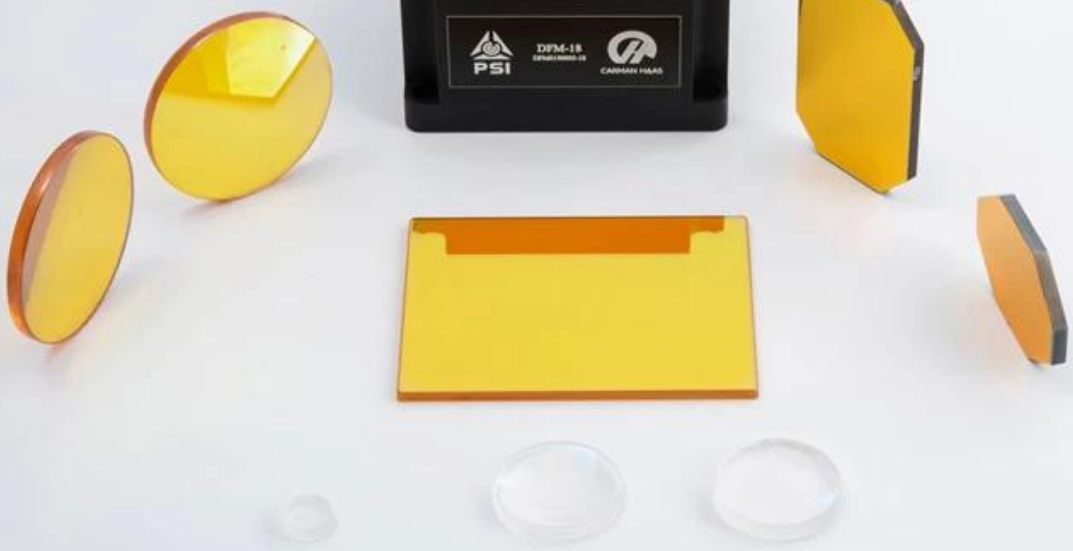


CARMAN HAAS

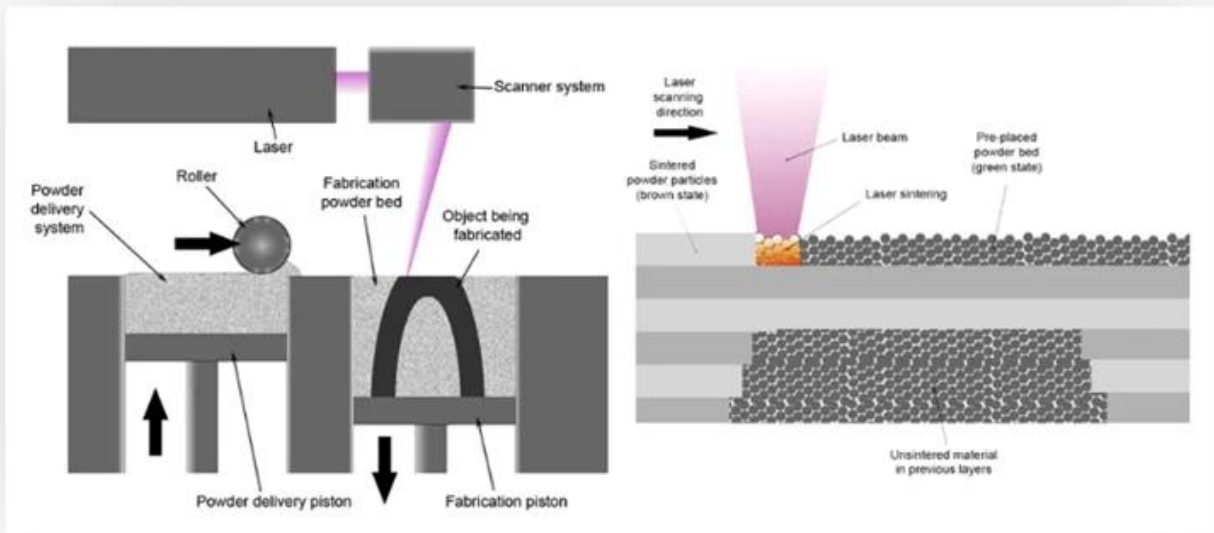


CARMAN HAAS

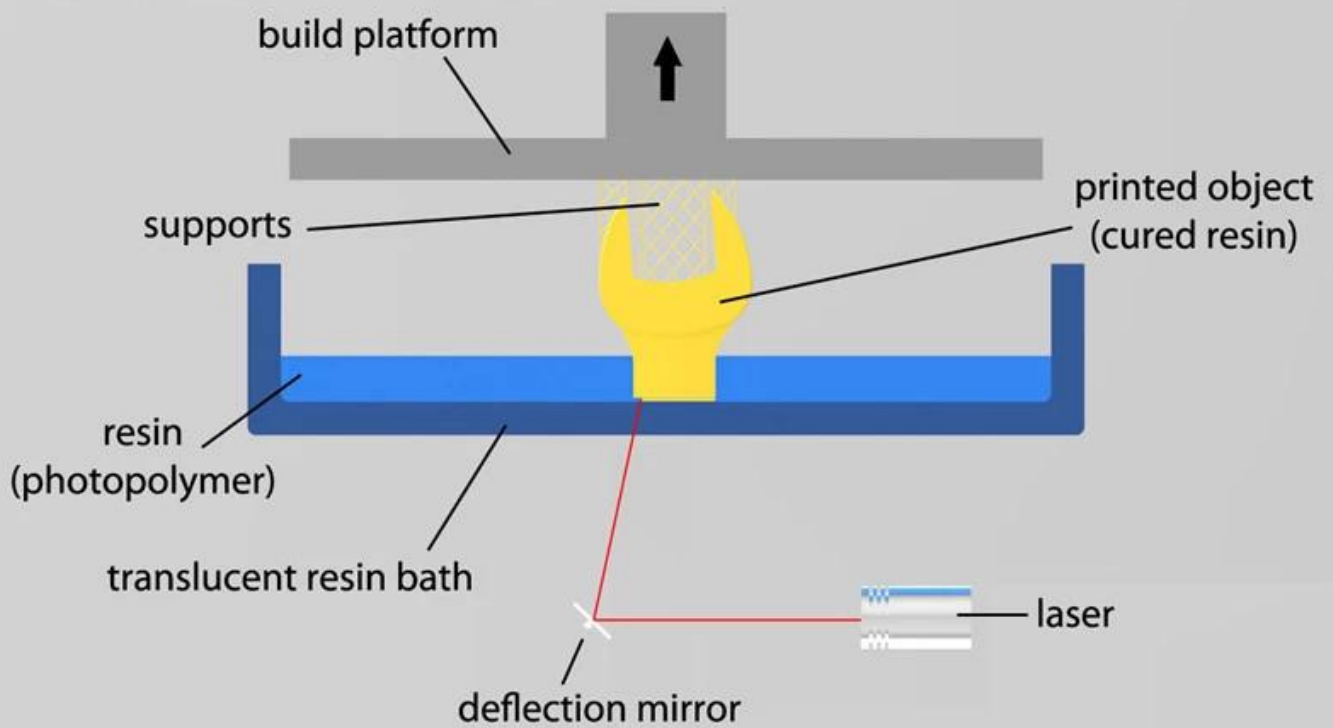




# How Does It Work? SLS



# How Does It Work? SLA



□ □ □ :

### SLM - Metal 3D Printing

Part Description	Focal Length (mm)	Scan Field (mm)	Entrance Pupil (mm)	Working Distance(mm)	Mounting Thread
SL-(1030-1090)-170-254-(20CA)-WC	254	170x170	20	290	M85x1
SL-(1030-1090)-170-254-(15CA)-M79*1	254	170x170	15	327	M79x1
SL-(1030-1090)-290-430-(15CA)	430	290x290	15	529.5	M85x1
SL-(1030-1090)-275-430-(20CA)	430	275x275	20	529.5	M85x1
SL-(1030-1090)-254-420-(20CA)	420	254x254	20	510.9	M85x1
SL-(1030-1090)-410-650-(20CA)-WC	650	410x410	20	560	M85x1
SL-(1030-1090)-440-650-(20CA)-WC	650	440x440	20	554.6	M85x1

**\*WC is for Water Cooling**

### SLS - Non-metal 3D Printing

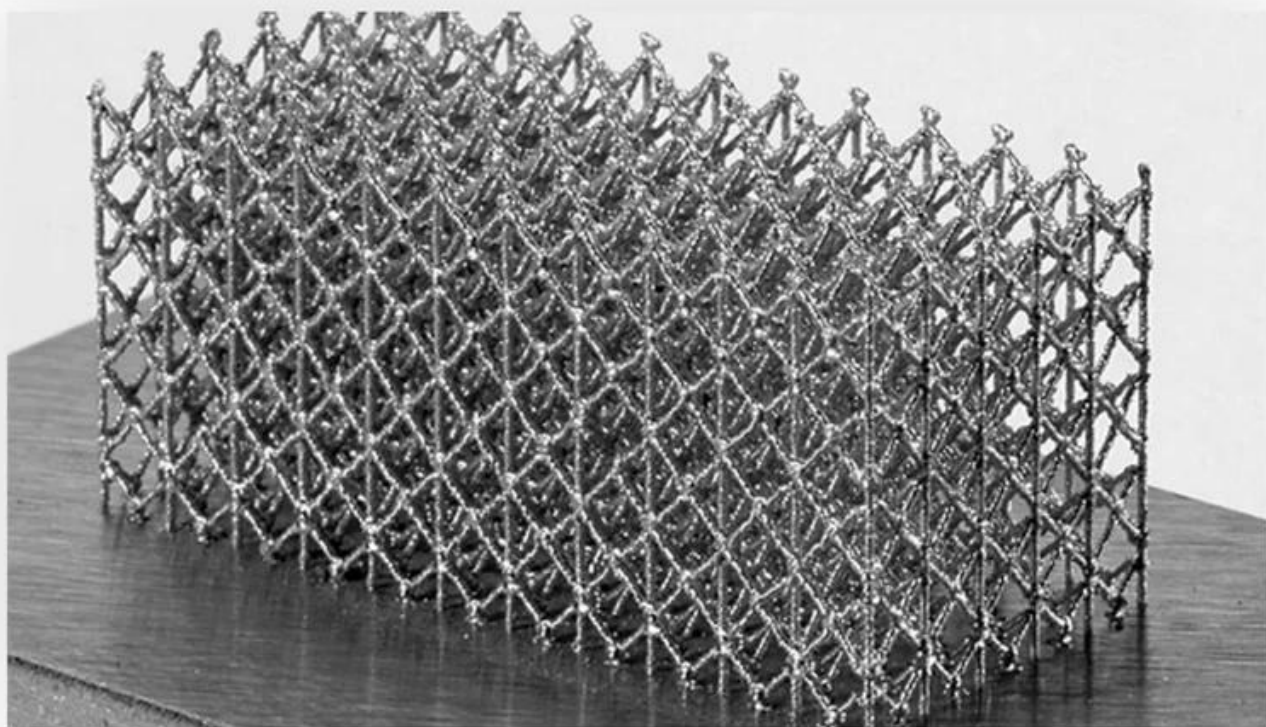
Part Description	Focal Length (mm)	Scan Field (mm)	Entrance Pupil (mm)	Working Distance(mm)	Mounting Thread
SL-10.6-250-360	360	250x250	14/20	352.9	M85x1
SL-10.6-300-430	430	300x300	14/20	414.7	M85x1
SL-10.6-400-565	565	400x400	14/20	536.5	M85x1

### SLA - UV 3D Printing

Part Description	Focal Length (mm)	Scan Field (mm)	Entrance Pupil (mm)	Working Distance(mm)	Mounting Thread
SL-355-530-750	750	520x520	10	824.4	M85x1
SL-355-610-840-(15CA)	840	610x610	15	910	M85x1
SL-355-800-1090-(18CA)	1090	800x800	18	1193	M85x1

SELECTIVE LASER MELTING (SLM)

## Pros and Cons



# Stainless Steel



Desktop FDM



Industrial FDM



Desktop SLA



Industrial SLA



Industrial SLS

## ZRPA12 ( PA12 Nylon Powder )



<b>PHYSICAL CHARACTERISTICS</b>	Grain Size: 50~55 $\mu$ m Shape: Spherical Apparent density: $\geq 0.40$ g/cm <sup>3</sup>
<b>THERMAL PROPERTY</b>	Melting Point: 182~185°C (10°C/min) Melting Enthalpy: $\geq 90$ J/g HDT: 83.8°C @1.8MPa / 146.1°C @0.45MPa
<b>MOLDING PERFORMANCE</b>	Density: 0.97 g/cm <sup>3</sup> Tensile Modulus: 1600 MPa Tensile Strength: 43 MPa Elongation at break: $\geq 15$ % Un-notched Impact Strength: 20.7 KJ/m <sup>2</sup> Notched Impact Strength: 3.8 KJ/m <sup>2</sup> Bending Modulus: 1432 MPa Bending Strength: 57 MPa

## ZRTPU ( Thermoplastic Polyurethanes Powder )

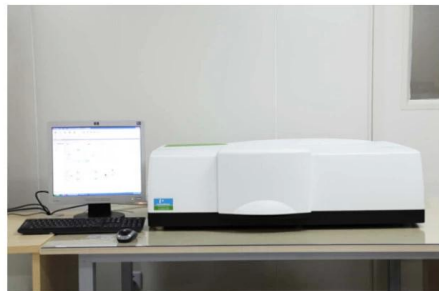


<b>PHYSICAL CHARACTERISTICS</b>	Grain Size: 60 $\mu$ m Shape: Spherical Apparent density: 0.47 g/cm <sup>3</sup>
<b>THERMAL PROPERTY</b>	Melting Point: 165°C HDT Heat deflection temperature: -25°C
<b>MOLDING PERFORMANCE</b>	Density: 1.15 g/cm <sup>3</sup> Tensile Modulus: 61 MPa Tensile Strength: 21 MPa Elongation at break: 310 % Tear strength: 101 N/mm Bending Modulus: 74 MPa Bending Strength: 3.3 MPa





**TRIOPTICS OptiSpheric 2000 AF**  
---Testing EFL, R, Centering Error, Wedge Angle, BFL, MTF

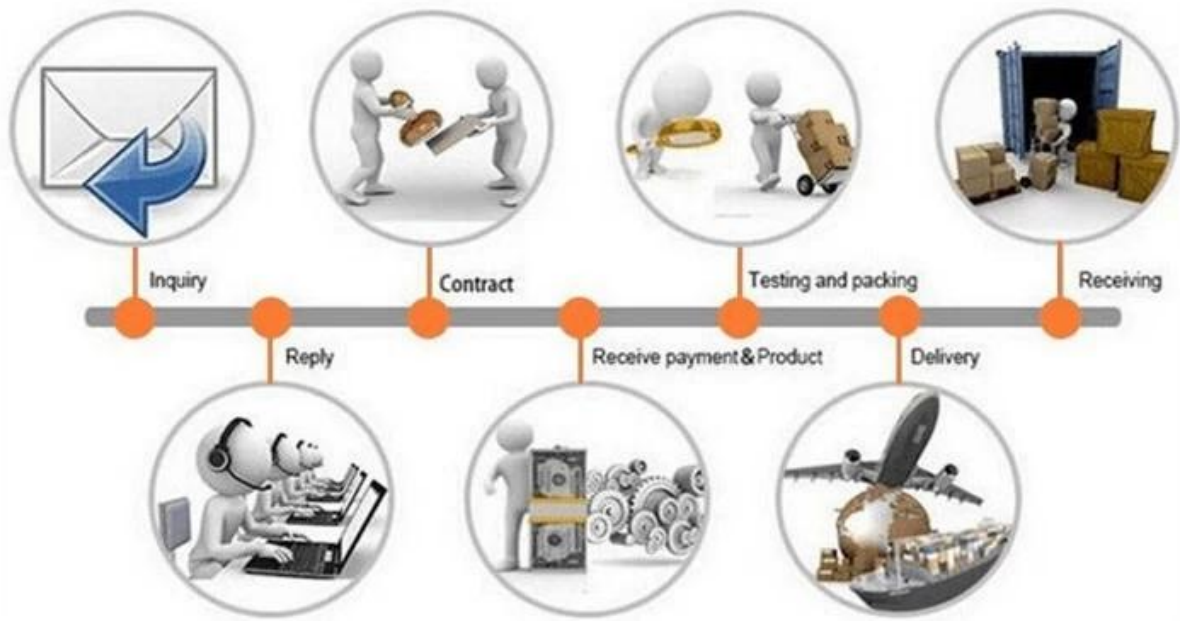


**PerkinElmer Lambda 950**---Testing Transmission and Reflectivity



**Carmanhaas Coating Machine**





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- 1 問) 〇 〇〇〇 〇〇〇〇 〇〇〇〇〇〇.
- 2 問) 〇〇〇 〇〇〇 〇〇 〇〇〇 〇 〇〇 〇〇 〇〇〇〇〇〇.
- 3 問) 〇〇〇 〇〇 〇 〇〇 〇〇〇 〇〇〇〇〇.
- 4 問) 〇〇 〇 〇〇 〇〇 〇〇〇 〇〇 〇〇〇 〇〇〇〇〇.

問 問:

- (1) 〇〇〇 〇〇 〇〇 〇〇〇 DHL, UPS, FedEx, TNT, EMS, ETS 〇〇〇 〇 〇〇〇〇.
- (2) 〇〇〇〇〇〇〇〇〇, 〇 〇 〇〇〇〇〇〇〇〇 〇〇〇〇〇〇〇 〇〇FOB, CNF, CIF. 〇〇〇〇〇〇〇〇〇〇〇〇〇〇〇 〇〇〇〇〇〇〇〇〇〇〇〇〇 〇.

問問問 問

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Q1. 〇〇〇〇〇 〇〇〇〇?

A1 : 〇, 〇〇〇 〇〇 〇〇〇 〇〇 〇 〇〇 〇〇〇 〇〇 〇〇〇〇〇 〇〇 〇 〇〇〇〇〇〇〇. (F-Theta 〇〇-〇〇 〇〇-〇〇)

Q2. 〇〇〇 〇〇〇 〇〇〇?

A2 : 〇〇〇 〇〇〇 〇 QC 〇〇 〇〇 〇〇〇 〇〇〇 〇〇〇〇 〇〇 〇〇 〇, 〇〇 〇〇 〇 〇〇〇 〇〇〇〇 〇〇〇 〇〇〇 〇〇〇〇〇.

Q3. 〇〇〇 〇〇〇〇〇?

A3 : 〇〇〇 〇〇 〇〇〇〇 〇〇 〇〇〇〇 〇〇 〇〇〇〇〇 〇〇〇 〇〇〇〇〇.

Q4. 〇〇〇 〇〇〇〇〇〇〇〇?

A4 : 〇〇〇 〇〇〇〇〇 〇〇 〇〇 〇〇〇〇 〇〇 〇〇〇〇 〇〇〇 〇〇 〇〇, 〇〇, 〇〇 〇〇 〇 〇〇 〇〇〇〇〇. 〇〇〇〇〇.

Q5. May May Marching 〇〇〇 〇〇〇〇〇 〇〇 〇〇〇 〇〇〇〇〇〇〇?

A5 : 〇! 〇〇〇 〇〇〇 〇〇〇 〇〇〇〇 〇〇〇〇〇 〇〇 〇〇〇 〇〇 〇〇 〇 〇〇〇〇.

Q6. 〇〇〇 〇〇 〇 〇 〇〇〇〇?

A6 : 〇, 〇〇〇 〇〇〇 〇〇〇 〇〇〇 〇〇〇〇 〇〇 〇〇〇〇〇.

Q7. OEM 〇〇 ODM 〇〇〇 〇〇〇 〇 〇 〇〇〇〇?

A7 : 〇〇 OEM / ODM ORD 〇〇 〇〇 〇〇〇 〇〇 〇〇〇 〇〇 〇〇〇 〇〇〇〇.ers. 〇〇〇 〇〇〇〇 〇〇〇〇〇 〇〇〇〇 〇〇 〇〇 〇〇〇〇〇.

Q8. 〇〇〇 〇〇〇 〇〇〇〇〇〇〇?

A8 : 〇〇〇 〇 〇〇〇 〇〇〇 〇〇〇 〇〇 〇〇 〇 MOQ 〇〇 T / T 〇〇 〇 〇 〇〇〇〇.