

TMW

# TAKAHASHI Machinery

***Machines for OPTICAL PARTS***

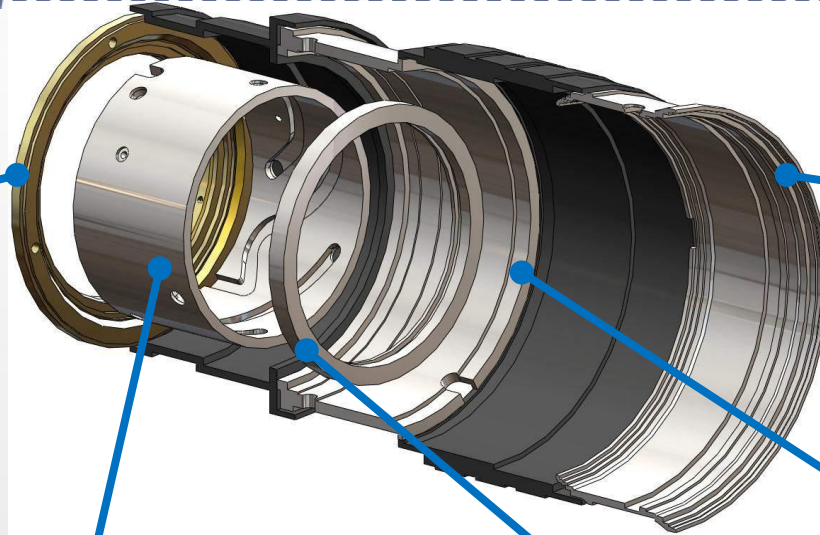


# Optical parts ;

- Camera Lens Barrel
- Projector Lens Barrel
- Micro Scope
- Monitor Camera



# Machines to make Optical parts ;



LM6



LD-1



L20



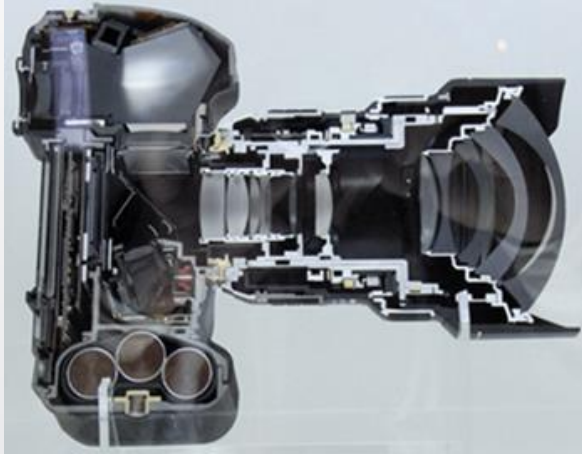
LD-1



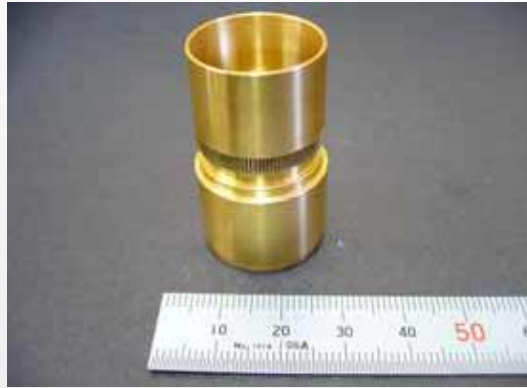
LD-1



# Optical parts ; **Various Camera** parts can be machined



# Optical parts ; **Other optical** parts can be machined



Sleeve



Micro scope



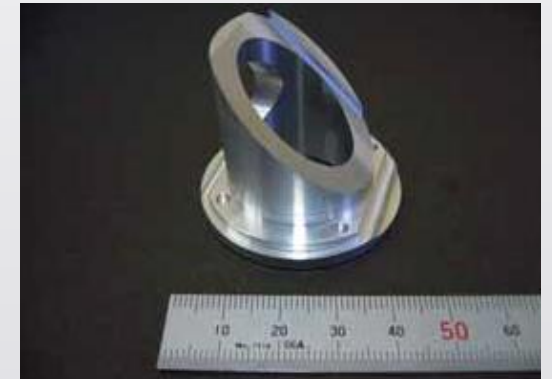
Level



Micro Scope



Gastric camera



Medical scope



# Machines to make Optical parts ;

TAKAHASHI has experience enough to make Camera parts

- **Better surface roughness:** Camera request “good looking” on parts after coating. If Surface roughness is no good enough, *coating* will be no good. ⇒ Built-in spindle ensure the better surface roughness.
- **Mirror finish:** Mirror finish is request for some specific parts. ⇒ Machine capability are *special insert* is required.
- **Better roundness:** Lenz request smooth movement to focus. Wall of Parts is very thin. Can't grove parts hardly ⇒ *special chucking* is needed.
- **Bigger telescopic lens:** bigger spindle bore is requested ( $\sim \phi 90$ ) ⇒ Machine with bigger bar capacity is available.
- **Special cam grooving:** Both accuracy and Surface roughness is highly requested. ⇒ Technology for *Special tooling* is needed.
- **Inner cam:** *special inner cam unit* is needed



# Type of machines we can serve for Optical industries



Camera, Cap



**Microstar : L20** (High speed Gang type CNC Lathe)

Chuck dia.	4
Turret	Gang
X/Z Travel (mm)	X:200,Z:200
X/Z Rapid (M/Min)	X:20,Z:20
Spindle speed(rpm)	10000
Spindle motor(kw)	2.2/1.5
Built-in type main spindle	

**Microstar: L30** (Precision Compact Gang type CNC Lathe)

Chuck dia.	5
Turret	Gang
X/Z Travel (mm)	X:250,Z:250
X/Z Rapid (M/Min)	X:12,Z:16
Spindle speed(rpm)	8000
Spindle motor(kw)	5.5/3.7
Built-in type main spindle	

Camera, Lenz flame



# Type of machines we can serve for Optical

Camera, Zoom lens



Medical camera



Micro scope



**LD1 (4-AXIS CONTROL  
PRECISION CNC TURNING CENTER**

Chuck dia.	6
Turret	16
Spindle speed	6000
Spindle motor(kw)	7.5/5.5
Milling speed	8000
Milling motor	5.5/3.7

Other size are available

**LM6(C2) (4-AXIS CONTROL  
PRECISION CNC TURNING CENTER**

Chuck dia.	6
Turret	16
Spindle speed	6000
Spindle motor(kw)	7.5/5.5
Milling speed	8000
Milling motor	5.5/3.7

Other size are available

Sensor body





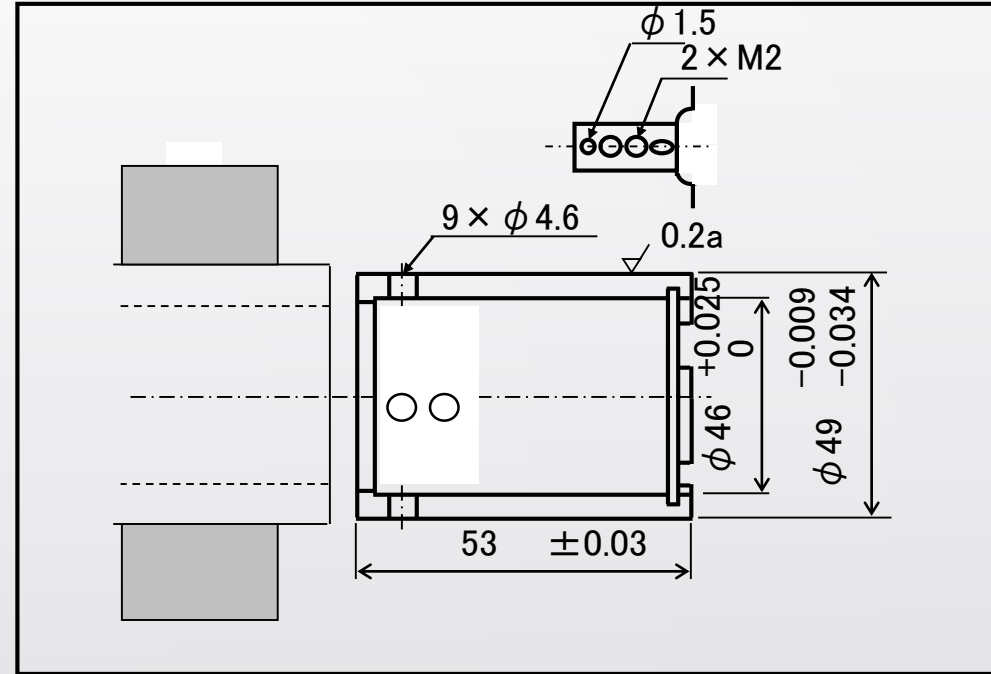
# Sample data

Work; Lens holder



Material: **A5056**

Material size:  $\phi 50 \times \phi 44 \times 1000$



## Technical data

- From bar, all process before annealing can be done by one machine
- High accuracy

Allowance on drawing ;  $\phi 46 \begin{matrix} +0.025 \\ 0 \end{matrix}$

Roundness : **0.01**

We achieved  $\phi 46 \begin{matrix} +0.005 \\ 0 \end{matrix}$

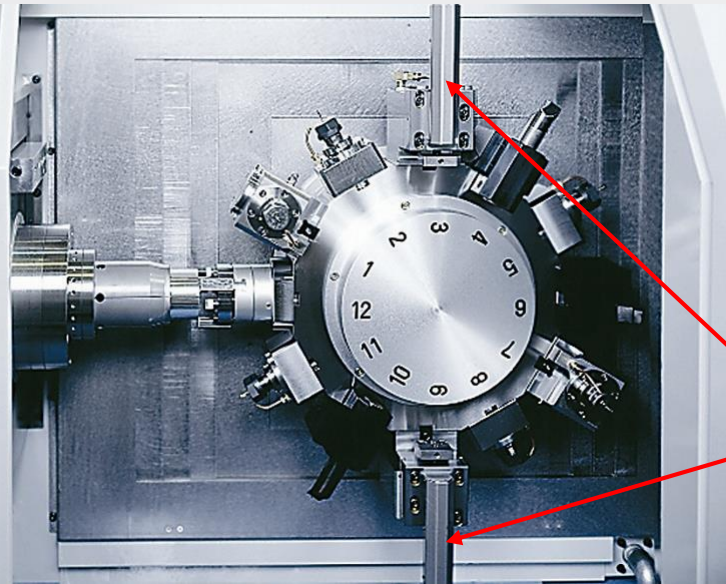
Surface roughness: **Ra0.08**

# CAM Barrel: Turn-mill center;LD-1



## ■ Future:

1. Built-in type main spindle motor is employed to minimize vibration and get better surface roughness
2. The headstock is kept cool by an oil chiller to maintain high thermal stability.
3. Main spindle can run 6000rpm and has Cs-control to generate 0.001 deg. incremental
4. The X and Z axis slideway is box structure employing Turcuit sheets with fine scraping finish. This configuration offer smooth slide movement and high repeatability.
5. The compact rigid 12 station is rotated by servo motor for non-lift quick index.



Inner cam milling unit





# LM6: Hob cutting can be done



## Future:

1. 16 different tool can be mounted permanently.
2. Various milling unit like an hob milling unit & Angle unit are available.
3. Machine has capability of various kind of operation including grinding operation within one chucking

