ADCERAX
ADVANCED CERAMICS

ENGINEERING PRODUCT CATALOG

Alumina Ceramic Laser Reflectors

Oval cavities and cylindrical liners for pump chambers

Select by cavity form, axial length, inner opening and lamp/rod layout. Use an AT-YHL-FS reference for an existing design, or a drawing for a new cavity.



Representative cylindrical cavity forms. The approved drawing defines the model and dimensions.

ADC-CAT-ALR-001 | Revision 01

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ADCERAX is a China-based supplier of advanced ceramic components, coordinating custom production and inspection with manufacturing partners.

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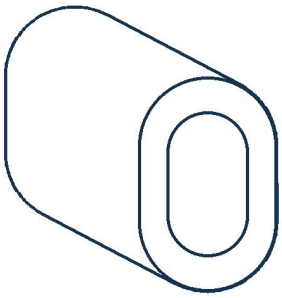
Oval reflector cavity models

Compare the axial body length and paired inner-opening dimensions. Confirm the locating features and chamber fit on the selected model drawing.



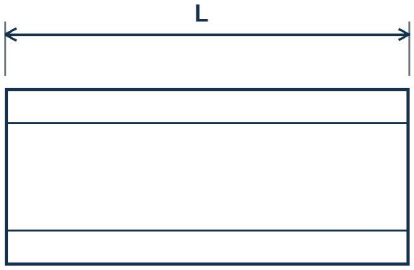
Representative product form; model-specific outer details and interfaces follow the drawing.

3D RECOGNITION



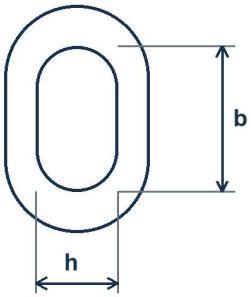
Representative profile only

SIDE VIEW



L axial body length

END VIEW



Dimension key — not to scale. L = axial body length; h = inner-hole height (short span); b = inner-hole length (long span). Source end-view directions are retained. Outer details vary by drawing.

Item number	L mm	h mm	b mm	Lamp / rod arrangement
AT-YHL-FS001	71.5	/	/	Elliptical cavity
AT-YHL-FS002	92	/	/	Elliptical cavity
AT-YHL-FS003	101	14.5	30	1 lamp / 1 rod
AT-YHL-FS004	100	17	45	2 lamps / 1 rod
AT-YHL-FS005	130	17	45	2 lamps / 1 rod
AT-YHL-FS006	150	17	45	2 lamps / 1 rod
AT-YHL-FS007	160	17	45	2 lamps / 1 rod
AT-YHL-FS008	170	17	45	2 lamps / 1 rod

“/” is retained for FS001 and FS002: the source lists no opening dimensions or lamp count. Use the model drawing for those fields.

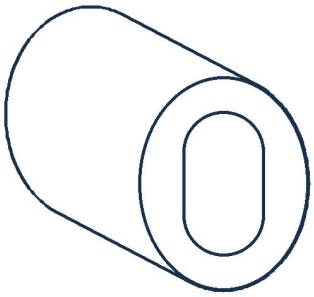
Dimensions are catalog references in mm. The quotation and approved drawing define final tolerances, surface, interfaces and availability; the table is not a stock statement.

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Cylindrical cavity liner models

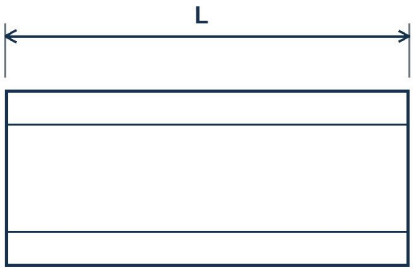
Compare the axial body length and paired inner-opening dimensions. Confirm the locating features and chamber fit on the selected model drawing.

3D RECOGNITION



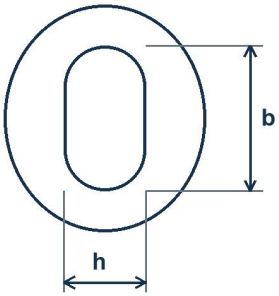
Representative profile only

SIDE VIEW



L axial body length

END VIEW



Dimension key — not to scale. L = axial body length; h = inner-hole height (short span); b = inner-hole length (long span). Source end-view directions are retained. Outer details vary by drawing.

Item number	L mm	h mm	b mm	Lamp / rod arrangement
AT-YHL-FS009	64	8	16.5	1 lamp / 1 rod
AT-YHL-FS010	89	9.3	19.3	1 lamp / 1 rod
AT-YHL-FS011	97	12	22	1 lamp / 1 rod
AT-YHL-FS012	97	15	27.7	1 lamp / 1 rod
AT-YHL-FS013	97	12	22	1 lamp / 1 rod
AT-YHL-FS014	100	14.4	28.4	1 lamp / 1 rod
AT-YHL-FS015	100	17	32	1 lamp / 1 rod
AT-YHL-FS016	100	18	34	1 lamp / 1 rod
AT-YHL-FS017	115	12	22	1 lamp / 1 rod
AT-YHL-FS018	117	12	22	1 lamp / 1 rod
AT-YHL-FS019	120	14.4	28.4	1 lamp / 1 rod
AT-YHL-FS020	120	16	43	2 lamps / 1 rod

FS011 and FS013 remain separate references with the same listed dimensions. Cite the exact code and confirm its model drawing; dimensions alone do not select between them.

Dimensions are catalog references in mm. The quotation and approved drawing define final tolerances, surface, interfaces and availability; the table is not a stock statement.

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Dense alumina material references

For a confirmed dense alumina cavity body, support or housing, compare the corresponding grade below. The optical working surface requires its own definition and finished-part acceptance.

Property	Unit and condition	999*	997	995	990	960	950*
Alumina content	wt% Al2O3, nominal	99.90	99.70	99.50	99.00	96	95
IEC 60672-3 class	composition group	C799	C799	C799	C795	C795	C795
Bulk density	g/cm³, typical	3.94	3.94	3.90–3.92	3.80–3.91	3.70	3.75
Water absorption	%, selection limit (AD-ALU-960: typical)	≤0.01	≤0.05	≤0.10	≤0.10	≈0	≤0.20
Color	visual	Ivory	Ivory	Ivory	Ivory	White	Ivory / white
Flexural strength	MPa, 20 °C, typical	315–340	330	320–350	300–320	300	280
Compressive strength	MPa, 20 °C, typical	2558–2900	2500	2400	2400	2000	2000
Young's modulus	GPa, typical	359–375	370	365	355	275 (20 °C)	340
Fracture toughness KIC	MPa·m½, method-dependent	3.8–4.2	3.6	3.5	3.3	3.5 (20 °C)	3.0
Hardness	typical	Mohs 9	Mohs 9	Mohs 9	Mohs 9	HV1 1600	Mohs 9

Grade key: 999 = AD-ALU-999; 997 = AD-ALU-997; 995 = AD-ALU-995; 990 = AD-ALU-990; 960 = AD-ALU-960; 950 = AD-ALU-950. *999 and 950 are reference columns in the source.

Material reference boundary

Values are typical data for dense alumina from the ADCERAX grade data sheet, Rev16. Composition is nominal; inequality and test-condition notation is retained. Each order is locked to one grade; values are not interpolated between grades.

These properties describe the base material, not the finished reflector, porous reflecting material or glaze. Reflectance, pump-light uniformity, cavity heat load and service life depend on the material route, surface, geometry and cooling, and are confirmed on the actual part.

Keep the measurement basis

AD-ALU-960 uses HV1 hardness; it is not a conversion to Mohs hardness. Near-zero water absorption is a rounded typical value and does not establish hermeticity. IEC composition grouping is not a product conformity certificate.

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Thermal and electrical material references

For a confirmed dense alumina cavity body, support or housing, compare the corresponding grade below. The optical working surface requires its own definition and finished-part acceptance.

Property	Unit and condition	999*	997	995	990	960	950*
Thermal conductivity	W/(m·K), typical	35–42 (25 °C)	35–40 (25 °C)	30–38 (25 °C)	24 (25 °C)	25 (20 °C)	18–25 (25 °C)
Mean thermal expansion	10^-6/K	7.6 (25–800 °C)	7.6 (25–800 °C)	7.6 (25–800 °C)	7.2 (25–800 °C)	8.2 (25–1000 °C)	7.6 (25–800 °C)
Service temperature guide	°C, material selection guide	1750	1700	1650	1600	1600 (max., air)	1400
Dielectric strength	kV/mm, typical	10 (5 mm)	10 (5 mm)	10 (5 mm)	10 (5 mm)	8.3 AC (6.35 mm)	10 (5 mm)
Relative permittivity, εr	1 MHz, typical	9.8 (25 °C)	9.8 (25 °C)	9.7 (25 °C)	9.6 (25 °C)	9.0 (room temp.)	9.4 (25 °C)
Dissipation factor, tan δ	1 MHz	<0.0001 (25 °C)	<0.0001 (25 °C)	<0.0001 (25 °C)	0.0006 (25 °C)	0.0002 (20 °C)	0.0004 (25 °C)
Volume resistivity	Ω·cm, 20 °C	>10^{14}	>10^{14}	>10^{14}	>10^{14}	10^{14} (typical)	>10^{12}

Grade key: 999 = AD-ALU-999; 997 = AD-ALU-997; 995 = AD-ALU-995; 990 = AD-ALU-990; 960 = AD-ALU-960; 950 = AD-ALU-950. *999 and 950 are reference columns in the source.

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Working surface and optical acceptance

Define the wavelength range, total or diffuse reflectance, inspection locations and measurement method. Review surface finish and any glaze with the pump-source spectrum, coolant contact and cleaning route.

The service temperature guide is a material-selection value, not a cavity operating rating. Coupon dielectric strength is not a finished-part working-voltage rating. AD-ALU-960 conditions remain explicit in the table.

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Select the cavity and assess replacement

Match the chamber before choosing a code

An alumina ceramic laser reflector is a cavity liner or insert arranged around a light source. In a lamp-pumped solid-state laser, the cavity profile and lamp/rod positions guide pump light toward the gain medium. IPL chambers follow the lamp and treatment-window layout of the device.

Selection step	What to compare
Chamber form	Oval cavity: elongated pump chamber. Cylindrical liner: round or tube-style outer chamber. Match the existing chamber profile and locating features.
Lamp and rod layout	FS003: one lamp and one rod. FS004–FS008: two lamps and one rod. Cylindrical model arrangements are listed on page 3. FS001/002 require the model drawing.
Axial fit	Compare body length, lamp-to-rod spacing, openings, mounting orientation and available assembly space.
Surface and cooling	Define active reflecting area, surface or glaze, pump-source spectrum and ceramic surfaces in contact with coolant.

Why alumina ceramic for the cavity

Alumina ceramic is a common cavity-liner material in lamp-pumped solid-state lasers. Machined or ground dimensions follow the drawing so locating datums and lamp-to-rod spacing have an agreed acceptance basis. The reflective area is a defined surface feature; purity and white appearance do not establish its optical performance.

Evaluate the failure before ordering a replacement

Observed condition	Evaluation and enquiry input
Deposits or discoloration	Compare the active area with the agreed visual and optical criteria. Include contamination, coolant and cleaning history.
Pitting or glaze loss	Check the reflective surface against its acceptance plan before further cleaning or replacement.
Chips or cracks	Evaluate lamp/rod openings, locating datums and sealing features against the drawing before return to use.
Seating or fit change	Check the cavity against the approved drawing if seating force or alignment changes; include the failure mode in the replacement enquiry.

Use the accepted code, drawing revision, surface specification and inspection method for a repeat order. Service life is application-dependent and is not assigned a universal value.

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Applications and packing definition

Industrial laser welding cutting and marking

For lamp-pumped solid-state laser heads, match the cavity profile and lamp-to-rod spacing to the gain-medium position and chamber space. Listed oval and cylindrical forms provide a starting point for model selection.

What to send: laser-head model or chamber drawing, lamp and rod diameters, lamp count, coolant type and quantity.

Replacement reflectors for lasers in service

Start from the old cavity code, drawing or clear photographs with measured dimensions. Match the locating features, active surface and coolant interface to the accepted part; a similar envelope does not establish interchangeability.

What to send: old code or measured photographs, machine model, observed surface/chipping/fit problem and quantity.

Medical and IPL aesthetic devices

An IPL or pulsed-light handpiece uses a lamp cavity to direct light toward the treatment window. It has no laser rod. Define the lamp seat, reflecting area, window opening and cooling path from the device drawing. Review electrode clearance and the cleaning route with the material and surface specification.

What to send: handpiece drawing or sample, lamp size, reflecting area, window size, cooling and cleaning methods, and quantity. Device acceptance requirements remain project-specific.

Protect the cavity edges and working surface

Packing control	Definition to agree with the order
Individual protection	Protect the cavity, datum faces and edges with suitable clean foam, a dust-tight bag or a hard box.
Separation	Keep liners apart with dividers so they cannot strike one another.
Identification	Specify item code, drawing revision, quantity and any set or lot identification required at receipt.
Transport and receipt	Agree outer packing, handling protection and arrival inspection for the destination; pack quantities and shipping configuration are quotation-controlled.

Packing fields are order-definition inputs. They do not imply a fixed packing unit or universal shipping arrangement.

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Handling assembly and surface care

Assembly checks

Check	Action
Fit and condition	Check body diameters, openings and datum faces against the drawing; inspect for chips, burrs and contamination.
Location	Align to the specified datums or reference flats and designed fit. Verify lamp–rod spacing, orientation and full datum contact before tightening.
Clamping	Apply loads evenly with calibrated tools to the assembly specification.
Clean seating	Use clean gloves, soft pads and suitable ceramic handling tools. Keep lamp and rod seats clear of particles.

Start up and operation

Check	Action
Start up	Follow the system’s approved power ramp, temperature limits, cooling flow and stabilization sequence.
Cooling	Confirm the required air or liquid path is clear before operation; follow the specified cooling interval during power cycling.
Lamp or rod replacement	Check seating, alignment and system output against the equipment’s acceptance criteria.

Storage and return to use

Use protective foam and a dust-tight bag or hard box; separate liners with dividers to protect edges. Keep storage dry, temperature-stable and protected from vibration and chemical vapours. Inspect surfaces, glaze where present and edges before using a stored part.

Cleaning and periodic inspection

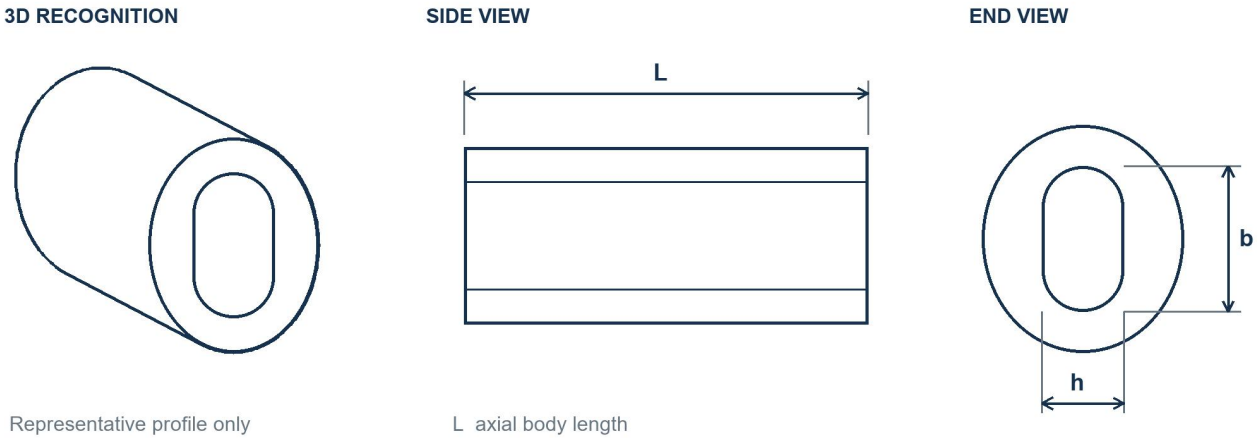
Check	Action
Cleaning route	Use the selected surface route’s approved non-abrasive chemistry and method with clean, lint-free handling.
Rinse and dry	Follow specified rinsing and complete drying before assembly. Inspect for residue, fingerprints and deposits under good lighting.
Surface changes	Evaluate against the agreed optical and visual criteria before further cleaning or replacement.
Maintenance	Match filtration and inspection intervals to the equipment procedure.

Clamping settings, cleaning chemistry, thermal limits and inspection intervals follow the selected surface and equipment procedure.

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Drawing options and acceptance

ADCERAX coordinates custom ceramic production and inspection with manufacturing partners. Define the functional geometry and surface requirements; the quotation identifies the agreed drawing and acceptance basis.



Envelope key — not to scale. L = axial body length; h = inner-hole height (short span); b = inner-hole length (long span). Representative cylindrical profile only; additional profiles, outer dimensions and interfaces require the customer drawing.

Drawing input	Definition for engineering review
Envelope and fit	L, inner opening h and b, ID/OD where applicable, wall thickness, asymmetric walls and shoulders; define datums and critical tolerances on the drawing.
Planning range	Custom OD up to 150 mm; dimensional tolerance ±0.2 mm, or ±0.1 mm for agreed tighter features. These are custom-planning values, not uniform specifications for FS001–FS020.
Length and form	Short or long inserts; single- or multi-lamp layout; straight, stepped, conical or segmented form by drawing.
Cavity and ports	Elliptical, cylindrical or D-type profile; lamp/rod openings and cooling or sensor ports.
Alignment and ends	Ground/lapped functional planes, flats or keyed slots; square, chamfered or radiused ends; sealing grooves and assembly edges.
Holes and interfaces	Alignment/mounting holes, vent/sensor slots, threaded inserts or cable pass-through features by drawing.
Material and surface	Lock one applicable grade/material route, active reflecting area, surface or glaze coverage and locally polished datums.

Agree the acceptance basis with the part

Specify cavity profile, bore positions and axes, datum relationships, dimensional tolerances, surface defects, glaze coverage and cleanliness. For optical acceptance, state the pump spectrum, total/diffuse reflectance requirement, test locations, method, sampling and report needs. Include coolant and cleaning exposure when relevant.

A material coupon value does not establish the reflector’s thermal, optical or life acceptance. Agree batch identification, packing and repeat-order revision control with the quotation.

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Engineering questions and RFQ

Does the laser output wavelength define the reflector's target spectrum?

The pump source and gain medium define the relevant pump-light bands. A 1064 nm laser output identifies the emitted laser wavelength; reflector selection uses the pump-source spectrum and the gain medium's absorption bands. Set the reflective-surface requirement for that pump-light task.

Do alumina properties describe finished reflector optical performance?

No. The property table lists typical values for dense alumina grades. Reflectance, pump-light uniformity and cavity life depend on the reflector's own material route, surface or glaze, geometry and cooling, and are confirmed by testing the actual part against the agreed optical acceptance plan.

How can a repeat order stay consistent with an approved sample?

Use the same approved drawing revision, cavity code, surface or glaze specification and inspection method as the accepted sample. The dimensional and optical acceptance records provide the comparison basis for the repeat batch; record any system or cleaning changes before revising that basis.

Start a laser reflector enquiry

Existing reference	New drawing or replacement design
Cite AT-YHL-FS code and catalog Rev01. Add quantity, known dimensions and the existing drawing revision or old-part reference.	Send a drawing, sketch, chamber outline or clear old-part photographs with measured dimensions and intended use.
Confirm the model drawing, lamp/rod layout, mounting orientation and end features.	Define form, openings, outer dimensions, locating datums, critical tolerances, interfaces and surface requirements.

Add for fit and performance review: specified alumina grade/material route; pump-source spectrum and operating conditions; active reflecting area, surface or glaze; coolant contact and cleaning route; dimensional and optical acceptance methods and required reports.

For the quotation: quantity and repeat-order needs, packing/identification requirements, destination and target schedule. Send the information you already have; ADCERAX coordinates the remaining geometry, surface and inspection details for a defined quotation.

Send a Laser Reflector RFQ

info@adcerax.com

Product page and enquiry form

ADCERAX | HUNAN ATCERA CO.,LTD
Ceramic supply and engineering coordination with manufacturing partners.