ADCERAX
ADVANCED CERAMICS



# Alumina Locating Pins

## For weld nuts, studs and fixture positioning

Select a catalog reference or define a custom pin for resistance welding, projection welding and automated fixtures. Review the locating fit, mounting geometry and weld cycle together.



Alumina stepped-pin family. Photograph shows representative form only; dimensions and material follow the selected part drawing.

**32 catalog references • Drawing-defined custom pins • Grade and acceptance review**

ADCERAX is a China-based advanced ceramics manufacturer for custom precision ceramic components. Production and inspection are coordinated with manufacturing partners against agreed specifications.

adcerax.com/product/alumina-locating-pin/

01 ENGINEERING PRODUCT CATALOG

# Choose the correct locating pin route

Use the pin to locate the workpiece and provide the electrical separation required by the fixture design. Material selection alone does not establish the fit, insulation performance or working life of the assembled station.



Representative short stepped-pin forms. The photograph does not identify individual catalog numbers or establish installed compatibility.

| Fixture duty | Selection focus |
|---|---|
| Weld nuts and studs | Match the workpiece hole, guide length, loading direction and weld-current path. |
| Robotic welding fixtures | Review part-entry alignment, clearance to the robot and electrodes, mounting support and collision exposure. |
| Checking and positioning fixtures | Define the locating datum, mating clearance and acceptance method; this catalog is not a pin-gauge calibration specification. |

## Use the route that matches the information available

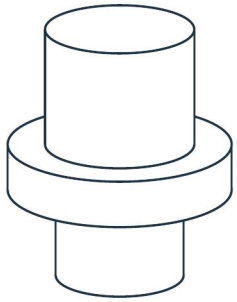
| Your starting point | What to use | Page |
|---|---|---|
| Existing AT-YHL-DWX reference | Length and maximum diameter lookup; verify the selected profile and fit on its drawing. | 3-4 |
| New part or replacement drawing | Define locating and mounting features, material and critical tolerances. | 5 |
| Material and station review | Compare grade-specific material data and identify the necessary weld-cycle checks. | 6-7 |
| Purchase and repeat order | Agree inspection, identification, packaging and the RFQ brief. | 8-9 |

Heavy impact, forced entry or severe thermal cycling require a station-specific material and support review. A shared outside diameter does not establish interchangeability.

# Catalog dimensions 001 to 016

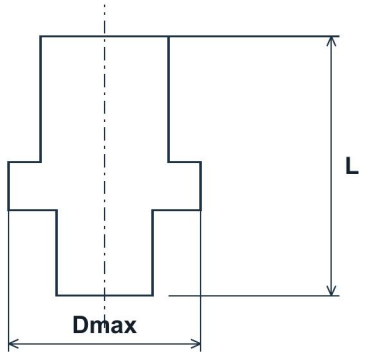
Catalog reference dimensions in millimetres. L is length; Dmax is maximum outside diameter. The figure explains the envelope fields using a representative stepped form; the individual head, shoulder and mounting profile follow the selected drawing.

**3D FORM RECOGNITION**



Representative stepped form

**GOVERNING SIDE VIEW**




Dimension key • Not to scale. Envelope dimensions do not define locating fit. The agreed part drawing controls all working and mounting features.

| Catalog reference | L (mm) | Dmax (mm) |
|---|---|---|
| AT-YHL-DWX001 | 35.6 | 13.8 |
| AT-YHL-DWX002 | 32.5 | 8.7 |
| AT-YHL-DWX003 | 42.2 | 7.3 |
| AT-YHL-DWX004 | 32.4 | 5.6 |
| AT-YHL-DWX005 | 17.7 | 8 |
| AT-YHL-DWX006 | 34.3 | 8.7 |
| AT-YHL-DWX007 | 24.3 | 6 |
| AT-YHL-DWX008 | 21.6 | 5.8 |
| AT-YHL-DWX009 | 23.7 | 4.9 |
| AT-YHL-DWX010 | 33.4 | 13.6 |
| AT-YHL-DWX011 | 33.2 | 11 |
| AT-YHL-DWX012 | 25.7 | 6.9 |
| AT-YHL-DWX013 | 27.1 | 7.9 |
| AT-YHL-DWX014 | 30 | 10 |
| AT-YHL-DWX015 | 28.3 | 7.8 |
| AT-YHL-DWX016 | 25.5 | 8 |

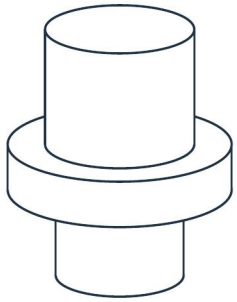
Material options for listed references: 95-99 wt% Al2O3. Specify the exact grade on the drawing or order; the catalog number does not assign a purity. Availability, tolerance, price and lead time are confirmed in the quotation.

Next step: send the reference number, quantity, fixture duty and any drawing or old-part photographs. Add the mating dimensions before ordering.

# Catalog dimensions 017 to 032

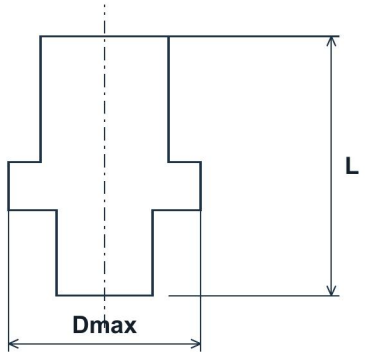
Catalog reference dimensions in millimetres. L is length; Dmax is maximum outside diameter. The figure explains the envelope fields using a representative stepped form; the individual head, shoulder and mounting profile follow the selected drawing.

**3D FORM RECOGNITION**



Representative stepped form

**GOVERNING SIDE VIEW**




Dimension key • Not to scale. Envelope dimensions do not define locating fit. The agreed part drawing controls all working and mounting features.

| Catalog reference | L (mm) | Dmax (mm) |
|---|---|---|
| AT-YHL-DWX017 | 23.2 | 6.9 |
| AT-YHL-DWX018 | 22.6 | 6.8 |
| AT-YHL-DWX019 | 22 | 8.9 |
| AT-YHL-DWX020 | 23 | 10.4 |
| AT-YHL-DWX021 | 27.8 | 8.7 |
| AT-YHL-DWX022 | 27.4 | 7.7 |
| AT-YHL-DWX023 | 23.8 | 8.8 |
| AT-YHL-DWX024 | 24.2 | 8.6 |
| AT-YHL-DWX025 | 28.5 | 13 |
| AT-YHL-DWX026 | 27.3 | 8.8 |
| AT-YHL-DWX027 | 23.7 | 9.8 |
| AT-YHL-DWX028 | 25.2 | 8.5 |
| AT-YHL-DWX029 | 37 | 12 |
| AT-YHL-DWX030 | 27.7 | 8.7 |
| AT-YHL-DWX031 | 27.1 | 6.6 |
| AT-YHL-DWX032 | 29 | 19 |

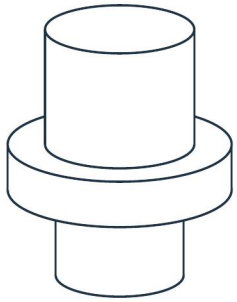
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Next step: send the reference number, quantity, fixture duty and any drawing or old-part photographs. Add the mating dimensions before ordering.

# Define a custom pin

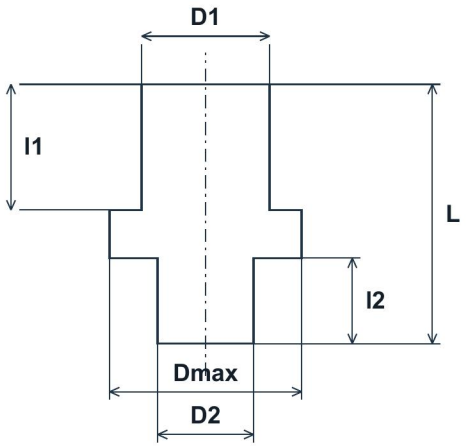
Custom locating diameters are typically 4-20 mm, with smaller or larger sizes by agreement. The custom length range is 20-150 mm. These custom supply ranges are separate from the discrete references on pages 3-4. Final geometry is agreed on the drawing.

**3D FORM RECOGNITION**



Representative stepped form

**GOVERNING SIDE VIEW**




Dimension key • Not to scale. End A and End B are geometric references; identify which end locates and which mounts on the submitted drawing. Exact profiles, shoulders and transitions are drawing-defined.

| Field | Definition and information to provide |
|---|---|
| L / Dmax (mm) | Length and maximum outside diameter of the complete pin. |
| D1 / l1 (mm) | End A diameter and axial length to the adjacent shoulder; identify its working function. |
| D2 / l2 (mm) | End B diameter and axial length to the adjacent shoulder; identify its mounting or locating function. |
| Remaining profile | Define every additional step, head, shoulder, lead-in and transition on the drawing. Add views for threads, flats or slots if required. |
| Fit and geometry | Locating and mounting tolerances; datum system, roundness, cylindricity, runout and relevant gauge length. |
| Surface and edges | Working surfaces, roughness requirement and measurement basis, entry chamfers, radii and permissible edge defects. |
| Material and supply | 95-99.5 wt% Al2O3 custom material options; specify grade, quantity, fixture conditions and acceptance requirements. |

For a pin-and-sleeve request, include both component drawings, clearance requirements and the assembled locating datum. Threads, retention features and thin sections need individual manufacturability review.

# Select material with the fixture conditions

The following four grades fall within the stated 95-99.5 wt% custom material range. Selection depends on the pin geometry, workpiece contact, weld cycle and required acceptance. A higher purity is not a substitute for checking impact or mounting stress.

| Grade | Al2O3 nominal wt% | Density g/cm³ typical | Flexural strength MPa at 20 °C typical |
|---|---|---|---|
| AD-ALU-950 | 95 | 3.75 | 280 |
| AD-ALU-960 | 96 | 3.70 | 300 |
| AD-ALU-990 | 99.00 | 3.80-3.91 | 300-320 |
| AD-ALU-995 | 99.50 | 3.90-3.92 | 320-350 |

## Thermal comparison

| Grade | Conductivity W/(m·K) typical | Mean expansion 10^-6/K | Expansion interval °C |
|---|---|---|---|
| AD-ALU-950 | 18-25 at 25 °C | 7.6 | 25-800 |
| AD-ALU-960 | 25 at 20 °C | 8.2 | 25-1000 |
| AD-ALU-990 | 24 at 25 °C | 7.2 | 25-800 |
| AD-ALU-995 | 30-38 at 25 °C | 7.6 | 25-800 |

Material reference: ADCERAX Alumina Ceramic Grade Comparison, Rev16, pp. 1-2. Nominal composition identifies the grade; typical values and ranges are not manufacturing tolerances or finished-pin design allowables.

## Hardness is method specific

AD-ALU-960 has a typical Vickers hardness of 1600 HV1 at a 1 kgf test force. AD-ALU-950, AD-ALU-990 and AD-ALU-995 list typical Mohs hardness 9. The two scales are not interchangeable, and neither value establishes pin wear life.

## Temperature must be qualified for the actual station

Specify the pin, workpiece and fixture temperatures, heating and cooling rates, dwell, atmosphere and cycle count. Material furnace-temperature guidance does not establish the allowable temperature or life of a mechanically clamped welding pin.

Use the exact grade in the order. Material properties must retain their stated test conditions; dimensions, defect limits and service suitability require the agreed component and process acceptance plan.

# Confirm insulation in the assembled station

Coupon dielectric strength is a material-selection value. It is not a finished-pin working-voltage rating or an allowable weld current. Fixture geometry, metal deposits, temperature and the actual current path affect electrical separation.

| Grade | Dielectric strength kV/mm typical | Specimen basis | Volume resistivity Ω·cm at 20 °C |
|---|---|---|---|
| AD-ALU-950 | 10 | 5 mm thickness | >10^12 |
| AD-ALU-960 | 8.3 | AC; 6.35 mm thickness | 10^14 typical |
| AD-ALU-990 | 10 | 5 mm thickness | >10^14 |
| AD-ALU-995 | 10 | 5 mm thickness | >10^14 |

Material reference: ADCERAX Alumina Ceramic Grade Comparison, Rev16, p. 3. Preserve specimen thickness and waveform when comparing values. Bounds are not exact measurements.

## Provide the station conditions that change the decision

| Input | What the review needs |
|---|---|
| Workpiece and loading | Nut, stud or sheet specification; hole tolerance, burrs, coating, loading direction, speed and potential misalignment. |
| Weld cycle | Process type, current and waveform, on-time, pulses, electrode force and station cycle rate. |
| Pin support | Locating clearance, support and clamping lengths, eccentricity, contact pressure and retention method. |
| Heat and contamination | Peak and cyclic temperatures, cooling method, metal spatter, deposits and cleaning practice. |
| Electrical acceptance | Actual assembly, voltage and waveform, test temperature, creepage and clearance, duration and failure criterion. |

## Validate service life against observable limits

Define inspection intervals and rejection criteria for diameter loss, taper, edge chipping, cracks, deposits and insulation change. Trial the actual workpiece, loading sequence and welding cycle. Record sample count and failure endpoints before comparing life results.

When replacing steel or another ceramic, evaluate the complete fixture condition. A material substitution can change fit, clamping stress and the required inspection method.

# Agree acceptance and repeat supply

Resolve drawing requirements before production. Record the accepted drawing revision, material grade, critical locating features and required documentation so subsequent orders refer to the same definition.

| Acceptance level | Requirements to agree |
|---|---|
| Material | Exact AD-ALU grade and composition basis; required material documentation and any batch-specific tests. |
| Locating surfaces | Diameter and geometry at defined measurement positions; roughness basis, lead-in condition and permitted edge defects. |
| Mounting surfaces | Fit, datum relationship, runout or perpendicularity where required, clamping length and retention features. |
| Visual condition | Acceptance limits for chips, cracks, pores, scratches and cleanliness; examination method and sampling. |
| Fixture assembly | Mating clearance, alignment, clamping stress, electrical path and replacement accessibility. |
| Welding validation | Actual process conditions, positional repeatability, insulation criterion, wear checks and agreed endurance endpoints. |
| Identification and packing | Drawing/revision, grade and lot reference; separation of pins and protection of working diameters, edges and projecting ends. |
| Repeat orders | Approved part reference, change record, quantity and documentation; reconfirm any altered drawing, material or station condition. |

These are order-definition and acceptance inputs. Test methods, sampling, reports, traceability and packing provisions are agreed in the quotation or purchase specification.

## Installation and maintenance

Check the part and drawing revision before installation. Inspect the locating edges and fixture seat, then align the pin with the mating bore. Avoid impact, forced insertion and using the ceramic pin to lever the workpiece.

Define clamping and cleaning methods for the fixture. After cleaning, check the locating surface and electrical path for damage or conductive deposits. Keep replacement pins separated and labelled by drawing and station.

## Manufacturing review

ADCERAX coordinates geometry, material, production and inspection review with manufacturing partners. Critical transitions, thin sections, threads and finished locating surfaces are reviewed against the requested drawing before the manufacturing route is agreed.

08 ENGINEERING PRODUCT CATALOG

# Request an engineering quotation

Start with the information already available: an AT reference, drawing, sketch or old-part photograph, plus quantity and fixture duty. Engineering details can be developed during review.

| Existing catalog reference | New or drawing-defined pin |
|---|---|
| Cite AT-YHL-DWX001-032 and this catalog revision.<br>Provide quantity, selected material if known and fixture duty.<br>Attach the part drawing or mating dimensions; identify any changes. | Attach the drawing or sketch with revision and units.<br>Define locating and mounting features, material, quantity and fixture duty.<br>For a replacement, include the old part and the failure mode. |

## Include these details when known

| RFQ field | Information to send |
|---|---|
| Identity | Catalog or drawing number and revision; pin-only or pin-and-sleeve request; station or application. |
| Geometry | Length, maximum outside diameter, locating diameter and effective length, mounting geometry and mating clearances. |
| Critical requirements | Datums, tolerances, surface finish, edge transitions, material grade and critical acceptance features. |
| Operating conditions | Workpiece/nut/stud; weld type and cycle; current/waveform, force, temperature, impact, deposits and cleaning. |
| Quantity and schedule | Prototype or replacement quantity, repeat demand, delivery destination and requested schedule. |
| Acceptance and supply | Required reports, inspection/test criteria, identification, packaging and any sample-approval requirement. |

## Send the drawing or technical brief

info@adcerax.com

Product page and enquiry

Telephone: +86 731 84428843 | WhatsApp: +86 19311583352

Please reference ADC-CAT-ALP-001 Rev 01. Final geometry, grade, tolerances, acceptance, quantity, availability, price and delivery terms are confirmed in the quotation and agreed order documents.

**ADCERAX | HUNAN ATCERA CO.,LTD**

China-based advanced ceramics manufacturer for custom precision ceramic components.