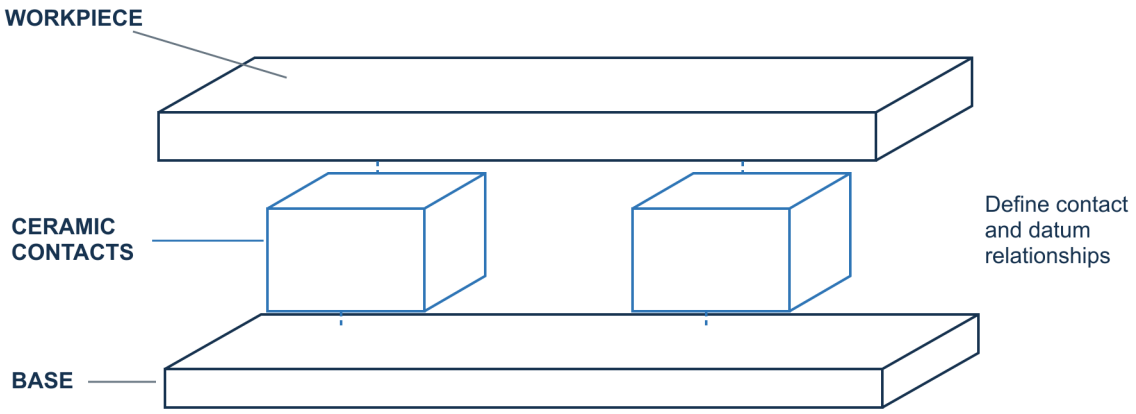
ADCERAX
ADVANCED CERAMICS

ENGINEERING PRODUCT CATALOG

Custom Zirconia Ceramic Positioning Fixture

Drawing-defined contacts and supports for workpiece positioning in tooling, measurement and assembly.

AT-YHG-ZJ2001 / Customize



Interface concept, not to scale. Workpiece, ceramic contacts and base are shown only to explain scope; this is not a supplied assembly or a product photograph.

Define the contact before the component

A locating face, stop or shaped seat establishes the workpiece reference. The ceramic geometry, mounting interface and clamping arrangement must be defined together. Use this catalog to prepare the drawing and acceptance requirements for engineering review.

Start here	Go to
Choose the task and purchase scope	02
Define geometry and drawing inputs	03
Review AD-ZRO-3Y properties and composition	04–05
Set service conditions and acceptance	06–08
Prepare a quotation request	09

ADCERAX® | HUNAN ATCERA CO.,LTD

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

01 / APPLICATION AND SCOPE

Choose the locating task

Start with the function of the ceramic contact, then define exactly which items belong in the quotation.

Your task	What the ceramic does	What to define
Machining or automated workholding	Locates or supports the workpiece within the fixture	Contact area; clamping-force direction; side load, impact and base attachment
Measurement or inspection	Provides a physical reference for the workpiece	Probe or sightline access; platform interface; clamping sequence and measurement procedure
Thermal-process positioning	Forms part of a contact/support arrangement	Temperature history; atmosphere; metal-to-ceramic fit and hot-state acceptance
Electronic or sensor assembly	Supports or aligns a component	Contact position; working clearance; cleaning, electrical and contamination requirements

These are application-review routes. Fitness for a particular machine or process is established for the agreed design.

Identify the purchase unit

Requested scope	Definition needed before quotation
One ceramic component	Part drawing and revision, material grade, quantity and the mating-base interface
A matching ceramic set	Individual part drawings, quantities per set, orientation and any matched-part acceptance
An assembly with other parts	Assembly drawing and bill of materials (BOM); identify the base, pins, inserts, fasteners and responsibility for assembly verification

The inquiry reference identifies a custom range

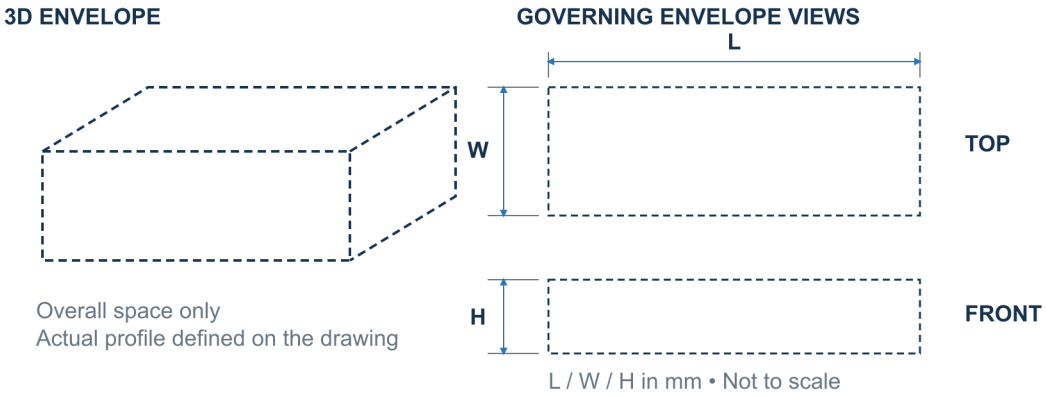
AT-YHG-ZJ2001 does not identify one universal size or a complete ready-to-install fixture. The drawing and quotation define the geometry, material, supplied items and acceptance. Metal bases and fastening parts are included only when explicitly agreed.

A similar name or photograph does not establish interchangeability with another fixture, locating pin, locating block or OEM part. Provide the part identifier and mating geometry for replacement review.

02 / CUSTOM SPECIFICATION

Define the drawing

There is no fixed catalog size for AT-YHG-ZJ2001. Supply the component envelope and a controlled drawing that defines the actual contact and mounting features.



Envelope key only, not a product profile or manufacturing drawing. L, W and H are customer inputs in mm. Actual holes, grooves, steps, radii and interfaces must be defined on the controlled drawing.

Drawing input	Required definition
L / W / H [mm]	Overall length / width / height of each ceramic component; identify orientation. State assembly envelope separately if an assembly is requested.
Actual profile and contact	Workpiece profile; locating faces or stops; grooves, slots and seats where applicable; contact areas and areas that must remain clear.
Datums and tolerances	Datum reference system A/B/C; dimension tolerances; position, flatness, parallelism or other functional geometric controls as required.
Mounting interface	Hole sizes, positions and center distances; seats and fits; base material; inserts, adhesive joints or fasteners where applicable.
Surface and edge condition	Ra or Rz on specified functional faces; edge breaks, chamfers or radii; allowable chips, cracks and surface defects.
Access and verification	Part insertion/removal path; tool or probe clearance; inspection setup, temperature, method and acceptance limits.

Drawing status

Identify the drawing number, revision, units and quantity. Mark critical features and the functional contact surfaces. Feasibility, final tolerances and supply scope are confirmed for the quotation; no generic tolerance or finish applies to every geometry.

03 / MATERIAL SELECTION

3Y zirconia material references

AD-ZRO-3Y is the first material to review for white structural zirconia locating contacts. Confirm the grade against the drawing and operating conditions.

Material property	Reference value	Basis and condition
Bulk density	6.00–6.08 g/cm^3	Typical; dense sintered material
Water absorption	0%	Typical rounded value; not a hermetic-leak specification
Vickers hardness	12.5 GPa	Typical; test force, dwell and surface condition to be agreed
Flexural strength	800–1000 MPa	Typical at 20 °C; specimen, surface and loading method apply
Fracture toughness K_{IC}	7.2–9.0 MPa·m$^{1/2}$	Typical at 20 °C; method-sensitive
Compressive strength	2000–3500 MPa	Typical at 20 °C; not an allowable fixture load
Young’s modulus	200–220 GPa	Typical at 20 °C
Poisson’s ratio	0.30	Typical; dimensionless
Thermal conductivity	3 W/(m·K)	Typical at 20 °C
Specific heat capacity	0.46 J/(g·K)	Typical; temperature interval to be agreed
Linear thermal expansion	11 × 10^{-6}/K	Material selection value for 40–80 °C only
Volume resistivity	>10^{14} Ω·cm	Material reference at 20 °C
Volume resistivity	10^6–10^8 Ω·cm	Typical at 300 °C

Source: ADCERAX Zirconia Ceramic Grade Comparison, Rev06, pages 1–3. Values are material-selection references, not guaranteed finished-fixture values. Agree the material evidence, test method, sampling and limits for purchase acceptance.

Keep the material and fixture decisions separate

Material strength, hardness and stiffness do not establish positioning accuracy, allowable clamping load, contact life or system life. The complete workpiece, ceramic part, base, joint, clamp and measurement setup determine the locating result.

04 / MATERIAL IDENTITY

Confirm the grade and composition

AD-ZRO-3Y is a yttria-stabilized structural zirconia. The following chemistry identifies the material reference; the order must state the exact grade and required batch evidence.

Component	Formula	Specification [wt%]	Typical [wt%]
Zirconia + hafnia	ZrO_2 + HfO_2	94.0–94.6	94.4
Yttria stabilizer	Y_2O_3	5.0–5.5	5.4
Alumina	Al_2O_3	0.20–0.30	0.22
Iron(III) oxide	Fe_2O_3	≤0.01	0.001
Titanium dioxide	TiO_2	≤0.01	0.001
Silicon dioxide	SiO_2	≤0.02	0.005
Calcium oxide	CaO	≤0.02	0.001
Sodium oxide	Na_2O	≤0.01	0.004

Source: ADCERAX Zirconia Ceramic Grade Comparison, Rev06, page 4; AD-ZRO-3Y only. Report oxide-equivalent mass fractions. HfO_2 is included with ZrO_2. Limits are not simultaneous maxima, and rounded typical entries are not a closed single-batch mass balance.

Retain grade and temperature identity

AD-ZRO-8Y, AD-ZRO-MG and AD-ZRO-CA require their own grade-specific data. Do not combine their values with AD-ZRO-3Y. Black zirconia requires separate formulation and finished-part confirmation; color alone does not establish conductivity.

The expansion value cannot be extrapolated across the full service-temperature range. The two resistivity references do not define an electrical rating, ESD behavior or a complete resistivity curve. Service temperature is qualified for the ordered design.

Specify how the material will be verified

Agree composition-analysis preparation, calibration, reporting basis and limits of quantification. For mechanical properties, state specimen geometry, surface preparation, loading or indentation conditions and the selected method. For thermal and electrical data, state the actual temperature range, atmosphere, electrode configuration and test duration as applicable.

Material verification does not replace inspection of the ceramic component or validation of the installed fixture system. See the acceptance levels on page 7.

05 / ENGINEERING REVIEW

Connect the load to the contacts

Define the force path from the workpiece through the ceramic contact and mounting interface into the base. Review temperature and environment with the same geometry.

Review area	Information to supply	Decision to resolve
Contact and support	Contact area or line; workpiece material; load direction; support reactions; clamping sequence	Where force is carried; edge loading and over-constraint
Dynamic and abnormal loads	Side load, eccentricity, vibration, inertia, loading impacts and possible jams	Local bending/tension and foreseeable overload conditions
Ceramic-to-metal joint	Base material; fit and clearance; preload, insert, adhesive or compliant-layer details	Assembly stress, retention and removal method
Thermal duty	Minimum, steady and peak temperatures; dwell; ramp rates; gradients; cycle count	Full-interval expansion, thermal stress and hot-state acceptance
Liquid, gas and cleaning exposure	Medium, concentration, pressure, flow, time and cleaning sequence	Compatibility under the actual contact and exposure conditions
Electrical and cleanliness needs	AC/DC voltage, frequency, humidity, surface contamination, leakage path and particle limits	Component-level insulation, ESD and cleanliness acceptance

Three limits that matter in fixture design

1 Material compressive strength is not an allowable fixture load. Include bending, tensile stress, contact edges and assembly stress in the design review.

2 A metal base and ceramic contact can change fit differently with temperature. Use expansion data covering the actual design interval; neither material can be assumed to expand more without the applicable data.

3 For AD-ZRO-3Y exposed to water or steam, assess hydrothermal ageing against temperature, duration, surface condition and the retained-property requirement.

Keep the whole tolerance chain visible

Connect the workpiece tolerance to the ceramic datums, base, joint clearance, clamp deformation, machine, measurement system, wear and temperature. Define initial, repeated-loading and in-service acceptance separately.

06 / ACCEPTANCE AND SUPPLY

Agree what will be inspected

The order should distinguish material evidence, ceramic-part acceptance, assembly checks and validation in the actual fixture system.

Acceptance level	Specify in the order or inspection plan
Material batch	Exact grade and stabilizer/formulation; required composition or property evidence; applicable test method, specimen condition, sampling and limits.
Ceramic component	Drawing and revision; dimensions and datums; geometric tolerances; contact finish; edge/defect limits; cleanliness and identification.
Assembled unit	BOM and supplied scope; seating and retention; fastening or bonding; contact pattern; load path; static/impact and thermal-fit checks where required.
Installed fixture system	Workpiece and machine; loading/clamping sequence; reference temperature; repeat-positioning test, measurement uncertainty, wear/drift and maintenance limits.

Set the project sequence before production

Drawing review → agreed quotation and inspection plan → first-article review when specified → batch acceptance and packing → repeat order by controlled revision. The quotation should identify each required step and its responsible party.

First-article and inspection requirements

Specify the measured features, reference temperature, support and clamping method, measurement force or probe/scan method, uncertainty and sampling. State whether a report or customer acceptance is required before the batch proceeds; include that requirement in the quotation.

Protect the surfaces that establish location

Supply input	Order definition
Packing and handling	Separate and protect locating faces, holes, slots and exposed edges; identify permitted support/handling areas. Agree the packing for the geometry and quantity.
Part and set identity	Part number, drawing revision, quantity per set, orientation and lot/inspection references where required. Keep matched sets identifiable.
Repeat supply	Retain the approved drawing, material grade and acceptance record. Identify changes to geometry, grade, inspection or the mating base before reordering.

The checks above are order-definition inputs. Inspection documents, packing, quantity, price and lead time are confirmed in the quotation.

07 / HANDLING AND SERVICE

Preserve the locating surfaces

Use a project-specific assembly and maintenance plan. A universal bolt torque, inspection interval or replacement life is not defined for this custom range.

At receipt and assembly

Use clean gloves, padded supports and soft-contact tools. Keep components individually protected in a dry, clean, temperature-stable space. Inspect contact faces, holes, slots and edges; clean the mating base and confirm even seating at the intended supports.

Use the drawing-defined fastening method, preload or tightening requirements and thermal-fit clearance. Select cleaning and drying methods for the specified material and assembly, then inspect the contact surfaces before reuse.

Observed issue	What to examine	Acceptance to define
Edge chip or crack	Handling impact; concentrated contact; thin sections; assembly stress	Defect limits and disposition for critical contact edges
Change in located position	Contact wear; debris; datum damage; base movement; clamp sequence	Repeat-positioning method, trend limits and rework/replacement criterion
Loosening at the base	Fastening, insert or bond condition; seating; fit over the temperature cycle	Retention check and project-specific reinspection interval
Drift during heating or cooling	Expansion mismatch, gradients, load and mounting constraint	Thermal-cycle profile and hot/cold geometry checks
Change after wet or steam exposure	Exposure history; surface condition; grade and retained properties	Ageing assessment and project-specific acceptance

Preparing an old part for replacement review

Photograph several sides with a scale, the mating base, the installation orientation and any part identifier. Mark intact datum/contact surfaces separately from worn or damaged areas. Provide the task, failure history, quantity and any drawing or previous order reference.

Scaled photographs can start the review. Critical dimensions, interfaces and acceptance need a drawing or agreed verification plan before manufacture. A replacement must reproduce the intended geometry, not the wear.

08 / REQUEST FOR QUOTATION

Send the drawing and the task

Reference AT-YHG-ZJ2001 and this catalog when requesting engineering review and quotation.

Existing drawing or repeat order

Send the previous order or part reference, approved drawing and revision, required quantity and destination. Identify every change in material, geometry, workpiece, base, service conditions, inspection or packing.

New design or old-part replacement

Start with a drawing, sketch, sample details or scaled old-part photographs. Include the workpiece and base relationship, intact contact surfaces, the task and quantity. The following checklist defines the information needed to complete the review.

RFQ item	Include with your request
Reference and scope	AT-YHG-ZJ2001; ceramic piece, matching set or defined assembly; drawing number/revision and units
Geometry and contacts	L/W/H, actual profile, datum A/B/C, contact/clearance zones, holes/slots, mating base and critical tolerances
Material and surfaces	Specified zirconia grade/formulation, color requirement, functional-face finish and edge condition
Load and environment	Clamp/support forces and directions; impact; mounting; temperature cycle; medium/cleaning; electrical or contamination needs
Acceptance and documents	Part/assembly/system checks; inspection method and reference temperature; sampling, limits and requested reports
Commercial and delivery	Quantity and quantities per set; repeat demand; packing/identification; destination and target schedule

Request a custom fixture quotation

info@adcerax.com

ADCERAX reviews the drawing, application and requested supply scope before quotation. Final grade, specification, supplied items, price and lead time are quotation-controlled.

HUNAN ATCERA CO.,LTD | Changsha, Hunan, China

Catalog reference: ADC-CAT-ZPF-001 | Revision 01