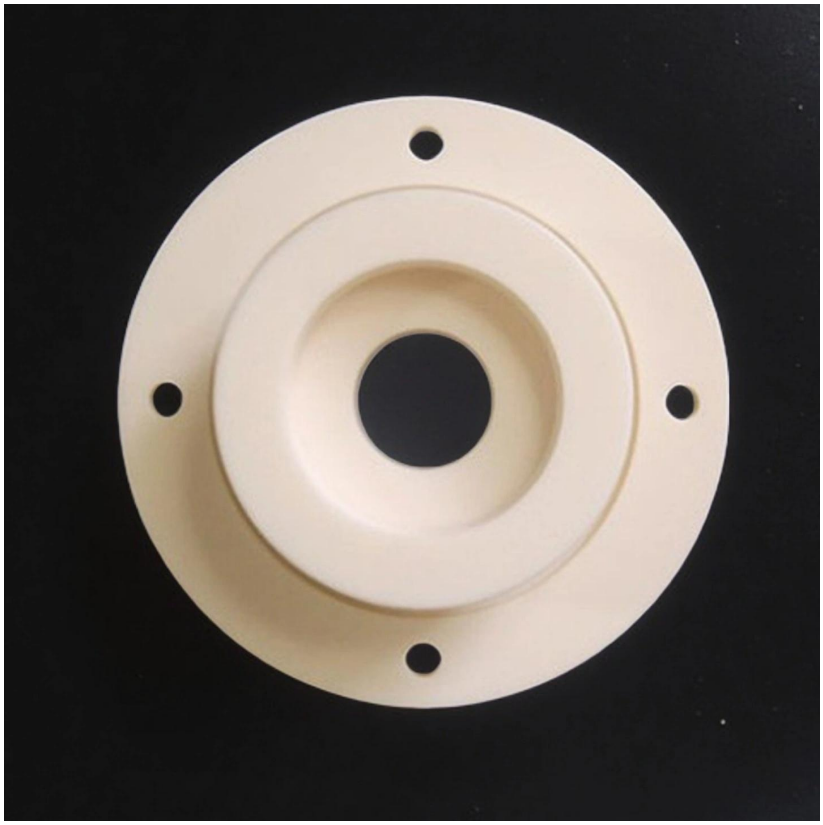
ADCERAX
ADVANCED CERAMICS

ENGINEERING PRODUCT CATALOG

Alumina Ceramic Flange

Drawing-defined interfaces for furnace tubes
vacuum equipment and insulated mounting



Representative circular flange form. The visible bore, annular step and mounting holes illustrate interface features; the approved drawing defines the ordered part.

Custom by drawing

Define the flange geometry, mating parts, material grade and operating conditions together. This catalog provides dimension inputs, material references and acceptance requirements for an engineering quotation.

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

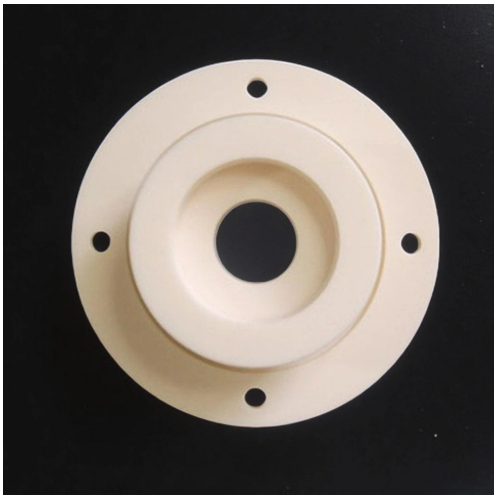
ADC-CAT-ALF-001 | Revision 01 | Review copy

Product page | info@adcerax.com

01 APPLICATION AND SCOPE

Select the interface before the grade

The supply unit is a drawing-defined ceramic flange component. A flange reference identifies the product route; it does not define a stock size, seal kit or tested assembly.



Representative form only. Hole pattern, bore profile and seal interface are drawing-defined.

Equipment route	Inputs that control selection
Furnace tube interface	Tube OD and support, flange temperature, atmosphere, heating and cooling cycle, differential expansion.
Vacuum or controlled atmosphere	Seal material and contact face, absolute pressure and differential pressure, allowable leak rate, cleanliness and test fixture.
Heater or insulated mounting	Working and test voltage, electrodes, creepage and clearance, temperature, fastener load and structural support.

Catalog route

Circular dimensions / page 3
Stepped interfaces / page 4
Material selection / pages 5 to 7
Acceptance and supply / page 8
Engineering RFQ / page 9

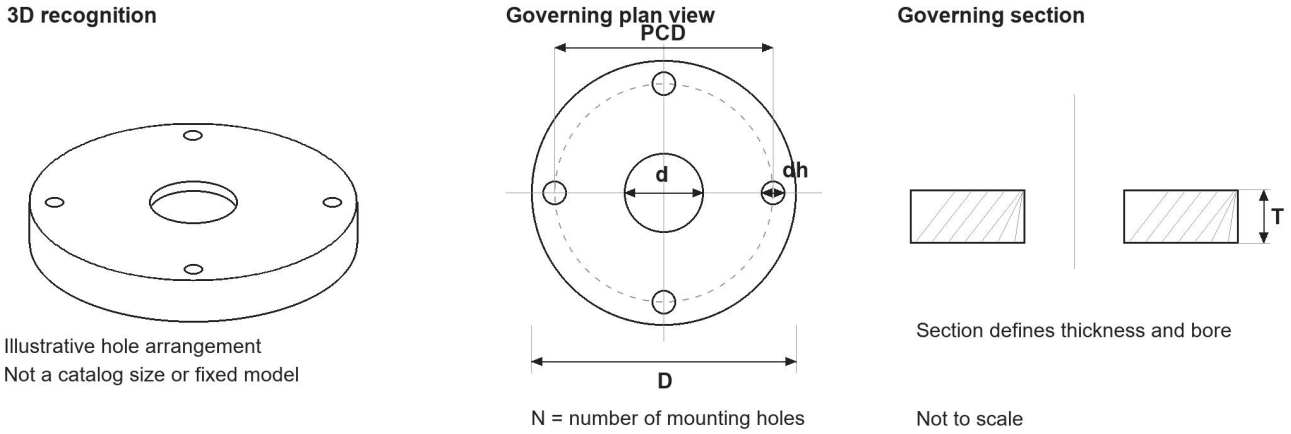
Scope boundary

Metal KF or CF flanges, gaskets, complete electrical feedthroughs and metallized or brazed assemblies require separate definitions. A ceramic component is not a certified vacuum or electrical assembly. Square bodies, flanged tube segments and other profiles require their own drawing rather than the circular dimension key.

02 DRAWING INPUTS

Define the circular flange

Product reference AT-YHL-FL01 is a custom identification route. No standard diameter, thickness or mounting pattern is specified here. Supply a dimensioned drawing and revision; state all dimensions in mm.



Dimension key - not to scale. Illustrative circular plate and hole arrangement; not a manufacturing drawing or an offered fixed configuration.

Field	Drawing input and meaning
D / mm	Outer diameter, tolerance and any flats or external profile features.
d / mm	Central bore diameter, tolerance and mating tube clearance.
T / mm	Base plate thickness between the principal faces, with tolerance.
PCD / mm	Pitch circle diameter of the mounting-hole centers. Define datum orientation and angular locations separately.
dh / mm	Mounting-hole diameter and tolerance. Detail counterbores, countersinks or inserts separately.
N / count	Number of mounting holes. The illustrated count is not a catalog specification.

Critical drawing controls

Identify the primary face, bore axis and angular datum. Specify hole position, concentricity or runout, flatness, parallelism, edge treatment and permitted defects where they affect assembly. General tolerances do not replace critical feature requirements.

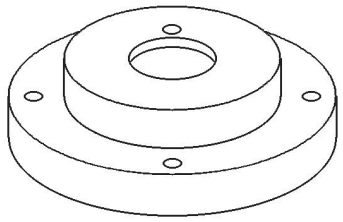
Final dimensions, machining state, tolerances and quantity are quotation-controlled. Material reference data do not establish dimensional capability.

03 INTERFACE REVIEW

Define the step and sealing interface

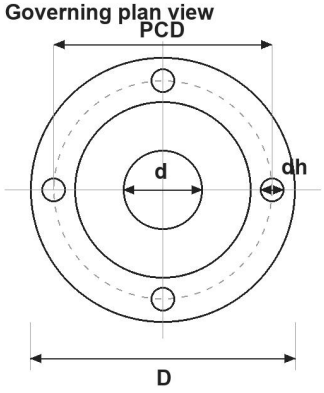
Where a raised annular step is required, define its envelope separately from the base plate. Recesses, grooves, tapered bores and other profiles need a section or detail view in the customer drawing.

3D recognition



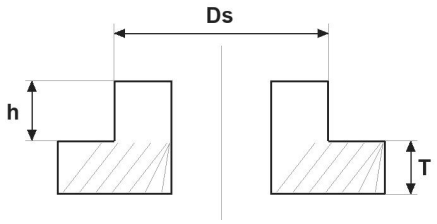
Illustrative hole arrangement
Not a catalog size or fixed model

Governing plan view



N = number of mounting holes

Governing section



Section defines thickness and bore
Raised annular step shown

Not to scale

Dimension key - not to scale. Raised annular step example only; the ordered profile and seal arrangement are drawing-defined.

Field	Definition to add to the circular dimensions
Ds / mm	Outer diameter of the raised annular step, with its tolerance and relation to the bore axis.
h / mm	Step height above the base plate face. T remains the base plate thickness; total height is defined in the approved drawing.

Sealing face and mating parts

Identify the effective seal band, face flatness, parallelism, surface texture and gasket geometry. Provide the mating flange or tube drawing, material, alignment method, support location and assembly direction. Define allowable contact pressure or preload in the assembly specification.

Service and validation

Specify continuous and peak flange temperatures, heating and cooling rates, atmosphere, pressure difference and allowable leakage. For electrical service, add waveform, frequency, electrode geometry, creepage and clearance. Torque, leak rate, pressure, thermal cycling and working voltage require assembly-level validation; material properties alone do not define them.

04 MATERIAL SELECTION

Compare composition and physical properties

Dense sintered alumina references from the ADCERAX six-grade technical data sheet Rev 16. Composition is nominal; properties retain the source conditions. Ordered grade and acceptance limits are defined by the quotation and purchase specification.

Property	Unit and basis	AD-ALU-999	AD-ALU-997	AD-ALU-995	AD-ALU-990	AD-ALU-960	AD-ALU-950
Alumina content	Al_2O_3; wt%; nominal	99.90	99.70	99.50	99.00	96	95
IEC 60672-3 composition class	composition grouping	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
Color	visual	Ivory	Ivory	Ivory	Ivory	White	Ivory / white
Water absorption	%; selection limit unless stated	≤0.01	≤0.05	≤0.10	≤0.10	≈0; typical, rounded	≤0.20
Mohs hardness	Mohs scale; typical	9	9	9	9	Not listed	9
Vickers hardness	HV1; 1 kgf; typical	Not listed	Not listed	Not listed	Not listed	1600	Not listed

Use the exact material grade

AD-ALU-960 is the 96% grade; it is not interchangeable with AD-ALU-950. The selection set covers 95%, 96%, 99.00%, 99.50%, 99.70% and 99.90% nominal alumina. Porous, black, transparent, coated, glazed or metallized ceramics require separate material definitions.

Composition and cleanliness

For contamination-sensitive interfaces, state allowed secondary oxides and trace elements, reporting units, sampling and analytical quantification limits. Grade identity should follow the agreed composition evidence rather than the appearance of the flange.

Interpret the data

IEC C795 and C799 identify composition groups; they are not product certification. Near-zero water absorption for AD-ALU-960 is a rounded typical value, not proof of hermeticity. Mohs and Vickers hardness use different scales and cannot be substituted.

Material reference values are not batch acceptance limits or finished-flange performance guarantees.

05 MATERIAL REFERENCE

Review thermal and mechanical conditions

Dense sintered alumina references from the ADCERAX six-grade technical data sheet Rev 16. Composition is nominal; properties retain the source conditions. Ordered grade and acceptance limits are defined by the quotation and purchase specification.

Property	Unit and basis	AD-ALU-999	AD-ALU-997	AD-ALU-995	AD-ALU-990	AD-ALU-960	AD-ALU-950
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 unless stated	359-375	370	365	355	275 at 20 °C	340
Fracture toughness, KIC	MPa·m½; method-dependent	3.8-4.2	3.6	3.5	3.3	3.5 at 20 °C	3.0
Thermal conductivity	W/(m·K); typical	35-42 at 25 °C	35-40 at 25 °C	30-38 at 25 °C	24 at 25 °C	25 at 20 °C	18-25 at 25 °C
Mean linear thermal expansion	10^{-6}/K; stated interval	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; application-dependent	1750	1700	1650	1600	1600 maximum in air	1400

Temperature is a material selection guide

These temperatures are application-dependent material guides, not flange, gasket or assembly ratings. Define the actual interface temperature, dwell, atmosphere, load, support, gradients, allowable deformation and required service life.

Preserve the measurement conditions

AD-ALU-960 thermal conductivity is at 20 °C and mean expansion is over 25-1000 °C. Other listed grades use 25 °C conductivity and 25-800 °C mean expansion. Fracture toughness is method-dependent. Material strength cannot be used directly as an allowable bolt preload, torque or bending load.

For a flange on a tube, define thermal movement and support in the assembly drawing. Tube straightness is not a flange flatness, hole-position or concentricity tolerance.

06 MATERIAL REFERENCE

Define electrical insulation and leakage

Dense sintered alumina references from the ADCERAX six-grade technical data sheet Rev 16. Composition is nominal; properties retain the source conditions. Ordered grade and acceptance limits are defined by the quotation and purchase specification.

Property	Unit and basis	AD-ALU-999	AD-ALU-997	AD-ALU-995	AD-ALU-990	AD-ALU-960	AD-ALU-950
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 at 25 °C	9.8 at 25 °C	9.7 at 25 °C	9.6 at 25 °C	9.0 at RT	9.4 at 25 °C
Dissipation factor, tan δ	1 MHz	<0.0001 at 25 °C	<0.0001 at 25 °C	<0.0001 at 25 °C	0.0006 at 25 °C	0.0002 at 20 °C	0.0004 at 25 °C
Volume resistivity	Ω·cm; 20 °C	$>10^{14}$	$>10^{14}$	$>10^{14}$	$>10^{14}$	10^{14}; typical	$>10^{12}$

Electrical test basis

RT means room temperature. Dielectric strength values are coupon references: 5 mm thickness for five grades, and AC at 6.35 mm for AD-ALU-960. Permittivity and dissipation factor are at 1 MHz with the stated temperatures. Do not multiply coupon dielectric strength by flange thickness to claim an operating voltage.

Specify the assembled insulation path

Provide working and test voltage, AC/DC/pulse waveform, frequency, electrode arrangement, insulating thickness, creepage, clearance, humidity, temperature and contamination conditions. State the test method, specimen or finished assembly, sample quantity and acceptance criterion.

Vacuum acceptance is a separate test

Specify the allowable helium leak rate or other agreed leak criterion, pressure difference, seal system, fixture, test gas, temperature and hold time. Water absorption and electrical properties do not establish the leak performance of the finished flange or sealed joint.

Material tests and functional tests should be identified separately in the purchase specification. A method listed as an option does not imply that every batch receives that test.

07 QUALITY AND SUPPLY

Agree acceptance and repeat supply

Freeze the approved flange drawing and acceptance plan before ordering. The following fields define the requested checks and documents; they are not a claim that every test is included by default.

Acceptance area	Requirement to place on the drawing or order
Material identity	Exact AD-ALU grade, composition evidence, any trace-element limits and required lot documentation.
Dimensions and geometry	D, d, T, hole pattern and step dimensions where present; datum system, tolerances, sealing-face flatness, parallelism and measurement temperature.
Surface and edges	Ra or Rz with evaluation direction and length; sealing-band limits, chamfers, allowable grinding marks, scratches, chips and cracks.
Inspection plan	Methods, gauges or fixtures, support, sample quantity, measurement uncertainty and acceptance limits for each critical feature.
Functional validation	Applicable leak, electrical or thermal-cycle test; specimen or assembly, fixture, service conditions and failure criterion.
Supply identification	Customer drawing number and revision, part reference, material grade, quantity, lot identification and required reports.
Packaging definition	Protect sealing faces, bore edges and hole edges; define individual separation, cleanliness, part labels and any sequence or matched-set identification.

Manufacturing review

Identify the as-fired, ground, lapped or polished state for each critical surface. Review machining allowance, minimum wall sections, hole-to-edge spacing and thickness transitions for the specified grade and geometry. The quotation records the agreed process state and achievable requirements.

Repeat orders

Reference the same approved drawing revision, material grade, acceptance plan and packing definition. Identify any changed mating part, seal, service condition or test requirement before treating the order as a repeat.

Price, MOQ, production schedule, lead time, available quantity and included documentation are confirmed in the project quotation.

08 ENGINEERING RFQ

Send the flange drawing for quotation

Send a dimensioned drawing or a clearly identified existing part, together with the conditions below. Cite ADC-CAT-ALF-001 Rev 01 and product reference AT-YHL-FL01.

New or modified flange

Drawing or 3D model and revision; circular, stepped, square or flanged-tube form; single ceramic component or assembly scope.

Exact material grade or selection request; composition and cleanliness limits; surface or joining state.

Complete dimensions and units: outer shape, bore, thickness, holes, PCD, steps and grooves; datums, tolerances and sealing-face requirements.

Mating tube, flange or chamber; materials, gasket, fasteners, preload requirement, support and thermal movement.

Continuous and peak temperature, atmosphere, heating and cooling cycle, pressure or vacuum, medium and allowable leakage; electrical conditions if applicable.

Quantity and repeat demand; required inspection reports, functional tests, acceptance limits and packaging; destination and target schedule.

Existing part or repeat order

Attach the approved drawing revision or previous quotation reference. State quantity, material grade, destination and target schedule, then list changes to geometry, mating parts, operating conditions or acceptance. A photograph helps identify the form but does not replace dimensions or the approved specification.

Request engineering review and quotation

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Open the product and inquiry page

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The inquiry proceeds to drawing and service review. The quotation defines the final part specification, acceptance, supply scope and schedule.