ADCERAX

ENGINEERING PRODUCT CATALOG / REVIEW EDITION

# Zirconia Ceramic Grading Wheels

## For dry powder air classifiers

Listed sizes, material selection and drawing inputs for OEM projects and maintenance replacement.



Product family visual reference. Appearance does not establish model, dimensions, material grade or operating performance.

### Six listed model sizes from OD 50 to 260 mm

These are discrete catalog sizes. Blade passages, the listed ID datum and hub or shaft fit remain drawing-defined. Supply scope and availability are confirmed in the quotation.

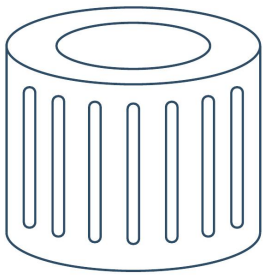
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01 / MODEL SELECTION

# Listed sizes

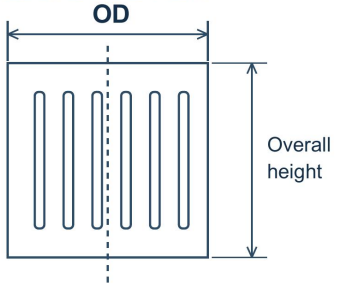
Use the six combinations below to identify a starting reference. A matching outer diameter alone does not establish interchangeability; blade geometry, rotation direction and the mounting interface must match the equipment drawing.

**3D FORM REFERENCE**



Illustrative slotted form

**ENVELOPE SIDE VIEW**




Envelope datums to drawing

**ID AND MOUNTING DATUMS**

ID is the listed internal dimension.

Mark its measurement surfaces on the actual part drawing.

Define shaft bore and hub fit separately from the listed ID.

No model-specific ID span or mounting profile is implied.

RFQ geometry guide. Not to scale; not a manufacturing drawing. The illustrated overall height is not assigned to the listed H. The approved part drawing defines the profile and measurement datums.

| Listed model | OD (mm) | ID (mm) | Listed H (mm) |
|---|---|---|---|
| AT-YHG-SM006 | 50 | 30 | 70 |
| AT-YHG-SM007 | 80 | 65 | 90 |
| AT-YHG-SM008 | 100 | 75 | 80 |
| AT-YHG-SM009 | 155 | 135 | 95 |
| AT-YHG-SM010 | 250 | 220 | 100 |
| AT-YHG-SM011 | 260 | 240 | 120 |

## Dimension reading

OD is the outer diameter. ID is the listed internal dimension: mark its measurement surfaces on the actual drawing and define the shaft bore or hub fit separately. H is the source-listed height; confirm its datum and define overall and effective blade heights on the approved part drawing.

## Order definition

Cite the model together with this catalog and the product URL. Confirm the drawing revision, zirconia grade, tolerances, surface condition, quantity and assembly scope. A listed size does not establish stock, a universal speed rating or compatibility with a named machine.

Product page and model reference

02 / DRAWING AND FIT

# Define the wheel configuration

A grading wheel, also called a classifier wheel, is a rotating component in a dry air-classification system. Define whether the inquiry covers the ceramic body or a configuration including a hub or sleeve. Specify any shaft, fasteners and assembly work separately.



Product family visual reference. The forms are not assigned to individual SM model numbers.

## Make the ID and height datums unambiguous

Provide an end view and an axial section. Mark the two ID measurement surfaces and the reference faces for the listed H. Show overall height and effective blade height separately, and identify the shaft bore or hub interface with its own dimensions.

| Drawing group | Information to define |
|---|---|
| Envelope and datums | OD, ID measurement surfaces, overall and effective blade heights, end-plate thickness and housing clearance. |
| Blade passages | Blade count, thickness, slot width, angle, inlet and outlet profiles, edge radii and rotation direction. |
| Mounting interface | Center bore, hub or sleeve, shaft fit, mating faces and any actual keyway, pin, thread or joining feature. |
| Acceptance features | Datum axis, dimensional and profile tolerances, runout, surface condition, and crack or chip limits. |

For a replacement, attach views of both ends, the passage profile and the mounting interface. Mark worn areas separately from intact datum surfaces; a worn sample is not the nominal drawing.

03 / MATERIAL SELECTION

# Compare zirconia grades

3Y zirconia is a starting point for strength, toughness and abrasive-contact material selection. The four grades below have different stabilizers and phase structures. Their inclusion is a material comparison; it does not establish that every listed wheel is supplied in every grade.

| Material system | AD-ZRO-3Y | AD-ZRO-8Y | AD-ZRO-MG | AD-ZRO-CA |
|---|---|---|---|---|
| Stabilizer | $Y_2O_3$ about 3 mol% | $Y_2O_3$ about 8 mol% | MgO | CaO |
| Phase at room temperature | Tetragonal dominant | Fully stabilized cubic rich | Partially stabilized | Partially stabilized / multiphase |
| Density g/cm³ · typical | 6.00–6.08 | 5.90 | 5.70–5.80 | 5.60–5.75 |
| Flexural strength MPa · 20 °C · typical | 800–1000 | 300 | 500–755 | 400–600 |
| Vickers hardness GPa · typical | 12.5 | 12.3 | 11.5 | 10–11 |
| Fracture toughness MPa·m½ · 20 °C · typical | 7.2–9.0 | 3.5–4.0 | 6–12 | 5–8 |

Source: ADCERAX Zirconia Ceramic Grade Comparison, Rev06, page 1. Dense-material specimen values; fracture toughness is method-dependent. Stabilizer contents in mol% are nominal.

## Use the comparison at the material level

AD-ZRO-3Y offers the highest flexural-strength range in this comparison. Toughness ranges overlap, so the data do not justify a universal ranking for wheel life. AD-ZRO-8Y is a functional, cubic-rich material with a different selection role. Mg-PSZ and Ca-PSZ require their own grade and application review.

## Lock the selected grade to the order

Identify the actual grade in the bill of materials (BOM) or material certificate. Agree specimen condition, test method and acceptance limits when material testing is requested. Black, ceria-stabilized and composite zirconia, including ZTA or ATZ, require separate data.

## Qualify the mounted rotor separately

Material strength and toughness are not design allowables for a finished wheel. They do not establish permitted rpm, balance grade, wear rate, cut size, service temperature or service life.

04 / OPERATING CONDITIONS

# Define acceptance at three levels

The wheel body, mounted rotor and classifier process have different acceptance objects. Put the requirements at the appropriate level so the ceramic part inspection is not mistaken for complete machine qualification.

| Acceptance object | Fields to agree | Evidence or record to specify |
|---|---|---|
| Ceramic wheel body | Dimensions and datums; blade edges and slots; center interface; surface and visual defects. | Drawing revision, measurement method, support condition, sampling and limits. |
| Mounted rotor | Hub and shaft fit; runout; residual imbalance; speed program and specified overspeed trial. | Assembly state, balance planes, correction method, speed, mounting and pass criteria. |
| Classifier process | Powder, gas, airflow, feed rate, target particle-size distribution, wear and contamination. | Trial conditions, sample locations, analysis method, repetition and acceptance limits. |

## Record the operating window

Provide continuous and peak speed, start and stop conditions, rotation direction, gas composition, airflow, feed rate and pressure difference. Identify temperature measurement points on the powder, gas, wheel and hub. The equipment requirements govern the selected assembly.

## Define the particle-size result

State whether the target is a cut point or a D10, D50 or D90 distribution value. Record the sampling location, size-analysis method and dispersion conditions. Wheel geometry, speed, airflow, feed and powder properties act together; rpm alone cannot specify the cut size.

## Make wear and purity measurable

For wear, define the location, baseline geometry or mass, throughput or time interval and rejection limit. For purity, compare feed, a process blank and fine and coarse products using the same analytical basis. Include zirconium, hafnium, the selected stabilizer and the process-sensitive elements, with the limit of quantification (LOQ).

No universal rpm, balance grade, service temperature or contamination limit is assigned by this catalog. Those requirements belong to the selected drawing, assembly and process qualification.

05 / REPLACEMENT AND MAINTENANCE

# Record wear before reordering

Use the accepted drawing and initial inspection record as the comparison baseline. The observations below help organize a replacement inquiry; they do not diagnose a failure without examining the part and operating history.

| Observation | Record for review | Acceptance item to revisit |
|---|---|---|
| Chipped edges or corners | Location, size, photographs and the feed or impact history. | Edge geometry, foreign-object exposure and crack or chip limits. |
| Worn blade passages | Slot width, blade thickness or profile at repeatable marked points. | Wear limit and any change in particle-size distribution. |
| Cracks near the hub or blade roots | Visible crack position, fit, fastening history and thermal events. | Connection loads, assembly condition and rejection criteria. |
| Changed vibration or balance | Powder deposits, uneven wear, cleaning and refitting history. | Runout and residual imbalance in the specified mounted state. |

## Before installation

Check part identity and drawing revision, blade edges, passage surfaces and the center interface. Match the shaft and hub, rotation direction and clearance to the equipment drawing. Do not put a visibly cracked wheel into service.

## During assembly and trial

Use the specified fastening load and calibrated tools. Check alignment, clearance, runout and balance in the agreed assembly state. Follow the equipment maker’s startup and speed program and the agreed process-trial plan.

## Cleaning and storage

Use the approved cleaning method and compatible tools. Protect thin edges and mounting surfaces, remove residues, and dry to the specified endpoint. Recheck the mounting state, runout and balance after refitting. Store on padded, stable supports in clean, dry conditions.

Numeric torque, clearance, speed and cleaning limits are specific to the selected equipment and part. Retain the equipment procedure with the wheel’s inspection record.

06 / DRAWING TO REPEAT SUPPLY

# Agree the supply definition

ADCERAX is a China-based advanced ceramics manufacturer for custom precision ceramic components. For classifier wheels, ADCERAX coordinates drawing review, production and inspection with manufacturing partners against the agreed specification.

## 1 Review the part and the duty

Start with a model reference, drawing, old-wheel photographs or sample details. Define the wheel body, hub or sleeve and assembly scope, together with the powder, speed, mounting and current replacement problem.

## 2 Confirm the specification and quotation

Confirm the drawing revision, grade, critical dimensions, blade features, fit surfaces and inspection requirements. Establish whether the order includes a ceramic part, a specified assembly, or separate qualification work. Price, minimum quantity, availability and lead time are confirmed in the quotation.

## 3 Set the inspection and delivery records

| Order record | What to specify |
|---|---|
| Part identity | Catalog or drawing reference, revision, material grade, quantity and lot or part identification. |
| Inspection scope | Dimension and visual checks; defined measurement datums; agreed sampling and acceptance limits. |
| Assembly and testing | Included components, runout or balance scope, and any agreed rotor or process qualification. |
| Documentation | Required material evidence, dimension report and other specifically agreed inspection records. |
| Shipping and repeat orders | Destination, target schedule, packing requirements and the accepted reorder specification. |

## 4 Plan protection around the wheel

Specify support and separation around the wheel envelope, thin blade edges and mounting interface. Match protective wrapping, restraints and outer packaging to the selected configuration and shipping route. Confirm identification so the drawing revision and inspection records remain associated with the part.

For repeat supply, retain the accepted drawing, grade, hub configuration and inspection plan. Notify ADCERAX of changes to the machine, powder, operating window or acceptance criteria.

07 / ENGINEERING INQUIRY

# Request a classifier wheel quote

Send the information already available. A model reference or an old-wheel photo can start the discussion; a complete drawing and operating brief support the configuration review.

## Route A  Start from a listed model

Cite AT-YHG-SM006 to SM011, the required quantity and this catalog reference. Attach the part or assembly drawing, or identify the equipment and old wheel. State required deviations from the listed OD, ID and height.

## Route B  Start from a drawing or existing part

Attach the drawing or 3D model with its revision, or provide sample details and clear views of both ends, blade passages and the mounting interface. Separate worn measurements from the intended nominal geometry.

| Include with either route | Useful information |
|---|---|
| Machine and supply scope | Equipment make/model; part reference; wheel body, hub/sleeve or assembly; rotation direction. |
| Geometry and material | Drawing revision; ID datum; blade profile; shaft fit; grade; tolerances and surface requirements. |
| Duty and target | Powder; continuous/peak rpm; gas and airflow; feed; temperatures; particle-size target. |
| Acceptance | Dimension, runout and balance scope; wear criteria; element limits and methods; required records. |
| Commercial requirements | Quantity and repeat demand; destination; target schedule; packing requirements. |

## Copy into your inquiry

Model / drawing revision: _____  Quantity: _____
Machine / supply scope: _____  Powder / rpm: _____
Material / acceptance requirements: _____  Destination: _____

## Send your drawing for engineering review and quotation

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