

AJ-1000

Air Jet Erosion Tester

Quantify Solid Particle Erosion with ASTM G76 Precision



High Temperatures • High Velocity
Air Jet • Double Disc Velocity Meter •
Adjustable Sample Angles

Beyond Standard Erosion Testing

The Complete Erosion Testing Platform

The AJ-1000 is a complete air jet erosion testing platform designed for accurate, repeatable solid particle erosion testing. Unlike conventional systems that estimate critical test parameters, the AJ-1000 directly measures particle velocity, precisely controls erodent feed rate, and offers continuously adjustable impact angles. From routine ASTM G76 testing to high-temperature studies up to 1200°C, it delivers reliable data with minimal operator influence.

Key Features

01 - Closed-Loop Erodent Flux Control

Erodent feed rate is metered and monitored in real time (1–10 g/min), not gravity-fed and eyeballed — so mass loss data stays comparable across operators, days, and labs.

02 - Integrated Double-Disc Velocimeter

Particle velocity is measured directly via a double-disc arrangement with HMI readout — not estimated from air pressure. This closes the biggest gap in ASTM G76 lab-to-lab repeatability.

03 - Continuously Adjustable Impingement Angle (0°–90°)

No fixed-angle inserts to swap. One holder, continuously adjustable, for full erosion-vs-angle curves in a single campaign.

04 - High-Temperature Erosion to 1200°C

Closed-loop PID air heating with an included temperature sensor — enabling erosion studies that track real turbine, aerospace, and power-plant service conditions, not just room-temperature screening.

05 - Tungsten Carbide Nozzles

Extended nozzle life under abrasive erodent flow means the orifice diameter — and therefore jet velocity — stays in calibration far longer than with standard steel nozzles.

06 — Full ASTM G76 / G211 Compliance

Erodent flux, jet velocity, impingement angle, and exposure time are all logged and controlled to ASTM G76 / G211, for a traceable, audit-ready erosion rate.

Next Generation Air Jet Erosion Tester

- ▶ Controllable Test Parameters
- ▶ Erodent Flux Rate Control
- ▶ Double Disc Velocity Meter
- ▶ Easy Sample Change and Nozzle Replacement



International Standards Compliance

The AJ-1000 is designed to run tests in full accordance with ASTM G76, the Standard Test Method for Conducting Erosion Tests by Solid Particle Impingement Using Gas Jets, which defines the method for determining material mass loss under gas-entrained solid particle impingement at controlled velocity, angle, and erodent flux.

It is complemented by ASTM G211-14, the Standard Test Method for Conducting Elevated Temperature Erosion Tests by Solid Particle Impingement Using Gas Jets — extending the same controlled-impingement methodology to high-temperature conditions up to 1200°C.

Together, these two standards make the AJ-1000 suitable for both ambient-temperature screening and elevated-temperature erosion studies for material qualification, coatings development, and failure analysis in aerospace, power generation, and process industries.

Sample Holder

The sample holder is continuously adjustable: 0° - 90° angles of impingement

Nozzles

The nozzles are made of tungsten carbide for extended life and better results due to relatively less wear out of the nozzle exit due to erodent.

Pressure Regulators and Gauges

The Air Jet Erosion Tester is supplied with one set of pressure regulators and gauges to monitor control the pressure in the air inlet so that the Air Jet velocities are accurately controlled.

Velocity Meter

Along with the Air Jet Erosion Tester, Rtec also supplies a Double Disc Velocity Meter to measure the particle velocity. This is a double disc arrangement used to determine the velocity of the Air Jet with control Unit - HMI (Human Machine interface).

Filters

The machine comes with Dust filters to ensure that the results are not affected due to external and unregulated dust particles that may enter along with the inlet air. The moisture filters ensure that the air is moisture free allowing the erodent flow freely. This allows the erodent feed rate to be maintained accurately.

Applications

Solid particle erosion drives component failure across industries handling abrasive flows — sand, ash, dust, and particulate-laden gas streams. The AJ-1000 quantifies and ranks material and coating resistance under controlled, repeatable conditions matched to real service environments.



Metals

Pipeline elbows, chokes, sand-laden flow lines



Aerospace

Turbines, compressors, sand erosion



Energy

Boiler tubes, cyclones, ash erosion



Defense

Armor coatings, desert operation, rotorcraft

Technical Specifications

Test parameters:

Air Jet Velocity	30 - 150 m/s (6 bar) up to 200 m/s (10 bar)
Erodent Feed Rate	1 - 10 g/min
Nominal	50 μ m angular Al_2O_3
Angle of Impingement	0° - 90°, continuously adjustable
Nozzle Diameter	2 - 6 mm
Sample Size	25 × 25 × 5 - 10 mm (thk.)
Hopper Capacity	3 liters maximum
Machine Dimensions	1750 × 1050 × 1900 mm (H)
Sample Loading	Automatic or Manual
Disk Velocity Meter	Double-disk, automatic or manual

Environment:

Temperature	Optional — up to 1200°C, closed-loop PID air control, sensor included
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International Standards:

ASTM G76-18	Standard Test Method for Conducting Erosion Tests by Solid Particle Impingement Using Gas Jets.
ASTM G211-14	Standard Test Method for Conducting Elevated Temperature Erosion Tests by Solid Particle Impingement Using Gas Jets.

Leading innovation
in surface and
materials testing.



Agent / distributor



Rtec-Instruments Office

Rtec-Instruments Inc USA

1810 Oakland Road, Ste B San Jose, CA,
95131, USA

+1 408 708 9226

info@rtec-instruments.com

Rtec-Instruments, JP Japan

Tokatsu Techno Plaza, Rm 4095-4-6
Kashiwanoha, Kashiwa-shi, Chiba, Japan,
227-0882

+81 50 5896 9916

info.jp@rtec-instruments.com

www.rtec-instruments.com

Rtec-Instruments, CN China

2nd Floor, Building 3, 69 Olympic St Jianye
District, Nanjing, China, 210019

+86 25 83210072, +86 18013892749

info@rtec-instruments.cn

Rtec-Instruments SA EMEA

Chemin des Taborneires 4 (Box 115)
1350 Orbe (Switzerland)

+41 24 552 02 60

info.eu@rtec-instruments.com



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