Our Products are Designed with Long-Term Service in Mind.
Why Choose Ceresist Ceramic Orifice Plates?

Truly unique in design, the OP Series ceramic orifice plates feature a solid ceramic insert enclosed in durable stainless steel 304 housing. Since ceramic is the only wetted component in the process, this makes the ceramic orifice plates ideal for reducing pressure, velocity, and eliminating cavitation in the most corrosive and erosive services.

Ceramic orifice plates offer substantial savings when considering reduced down-time, increased production, and less component replacement.

Benefits at a Glance

- The most resistant material to wear, erosion, and abrasion
- Inert to the corrosive effects of acids and alkalis
- The ceramic insert is the only wetted component
- Durable stainless steel housing ensures protection against harsh atmospheric environments
- Interchangeable and replaceable ceramic inserts are cost effective
- Simple design allows rapid maintenance and minimal down-time
- Wide operating parameters allow use of standard product in a multitude of applications
- 100% locally-sourced materials and in-house manufacturing
- Complete range of sizes and bores
- Custom configurations available
Wear, Erosion, and Abrasion Resistant:
Alumina ceramic is 15 times more wear resistant than stainless steel, and sintered silicon carbide ceramic is 36 times more wear resistant. This allows the use of ceramic orifice plates in the most aggressive services that would otherwise limit the useful service life of conventional pressure-reducing devices. The thick, solid-ceramic insert has been designed so as to not suffer damage from large solids within the flow, and therefore assures dependable, long-term service without any required maintenance.

Corrosion Resistant:
The ceramic materials utilized in the manufacture of the OP Series ceramic orifice plates are inert too, and do not interact with virtually all organic and inorganic chemicals used in manufacturing processes. Our ceramic materials are fully compatible with a wide range of chemicals, and can even withstand highly corrosive fluids at elevated temperatures with no damaging effects.

Unaffected by Cavitation:
Ceramic orifice plates may be safely used in high differential pressure and high velocity services without any damaging effects due to cavitation. In fact, the ceramic materials used in the OP Series are not affected by cavitation at all.

Computerized Fabrication and Inspection:
The OP-Series ceramic orifice plates are engineered, designed, manufactured, and assembled in the USA. Our factory is equipped with the latest CNC fabrication machinery as well as computerized metrology equipment for in-process and final inspections. All critical dimensions and bore diameters are held to tolerances of 0.002” or less, with tighter bore tolerances optionally available upon request.

24-Month In-Service Warranty:
The use of the finest materials in our assemblies allows us to offer our OP-Series ceramic orifice plates with a warranty against corrosion, erosion, and/or faulty workmanship for a period of up to 24 months in service. Should any of the components fail within this period, we will either repair or replace the failed components at no cost to the end-user.
### Corrosion-Resistance Comparison

<table>
<thead>
<tr>
<th>Fluid (Ambient Temperature)</th>
<th>Sintered Silicon Carbide</th>
<th>Partially-Stabilized Zirconia</th>
<th>99.5% Alumina</th>
<th>90% Alumina</th>
<th>SS304</th>
<th>SS316</th>
<th>Stellite* 6</th>
<th>Inconel* 600</th>
<th>Tantalum</th>
<th>Titanium</th>
<th>Hastelloy-C* 276</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% H₂SO₄</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>A</td>
<td>D</td>
<td>A</td>
</tr>
<tr>
<td>36% HCl</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>A</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>70% HNO₃</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>D</td>
<td>D</td>
<td>C</td>
<td>A</td>
<td>A</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>50% H₃PO₄</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>D</td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>26% NH₄OH</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>A</td>
<td>-</td>
<td>A</td>
<td>D</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>30% NaOH</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>C</td>
<td>-</td>
<td>A</td>
<td>D</td>
<td>D</td>
<td>C</td>
</tr>
</tbody>
</table>

**Key**

A  Not affected by corrosion  
B  Recommended for long-term service  
C  Not recommended for service greater than one year  
D  Not recommended for service greater than one month

Registered trademarks: Stellite® 6 – Deloro Stellite Group, Inconel® 600 – Special Metals Corporation, Hastelloy-C® 276 – Haynes International

### Erosion-Resistance Comparison Chart

- **Relative Life**
  - 1  Stainless Steel 316  
  - 1.5  HC-276  
  - 2.64  Basalt  
  - 4.48  Chrome Hardfacing  
  - 7.46  Stellite 6  
  - 8  80% Alumina  
  - 8.75  Nitride-Bonded SiC  
  - 9  Zirconia  
  - 12  99.5% Alumina  
  - 15  90% Fine-Grain Alumina  
  - 30  RB SiC  
  - 36  Sintered SiC

- **Material**
  - Stainless Steel 316  
  - HC-276  
  - Basalt  
  - Chrome Hardfacing  
  - Stellite 6  
  - 80% Alumina  
  - Nitride-Bonded SiC  
  - Zirconia  
  - 99.5% Alumina  
  - 90% Fine-Grain Alumina  
  - RB SiC  
  - Sintered SiC
REPLACEABLE CERAMIC INSERTS

The unique and innovative design of the OP Series ceramic orifice plates allows the end-user to quickly dismantle and replace the ceramic inserts. This cost-effective and intuitive design eliminates the need to purchase new assemblies, does not require special tools, does not demand cumbersome assembly or alignment methods, and may be completely refurbished and reinstalled into the process line in minutes, saving costly labor and down-time.

Multiple bore-size inserts may be purchased to fine-tune flow conditions, compensate for adjustments or changes in the control loop, or can simply be discarded and replaced with a new insert when the original has performed its usable service life.

Inexpensive ceramic inserts are readily available in a variety of sizes, bores, or ceramic materials to suit each process or fluid. Typically in stock, delivery for either spare replacement ceramic inserts or whole assemblies is rapid, eliminating the need to stock locally.

TEMPORARY INSERTS

Replacement orifice inserts are optionally available in carbon steel, stainless steel, Duplex, Hastelloy-C®, etc. The orifice plate with the temporary insert would be installed in the piping during plant commissioning and start-up, allowing for the end-user to make flow and pressure adjustments to the system - and also bore adjustments to the orifice plate - prior to installation of the permanent ceramic insert. Once the final bore size is confirmed, a ceramic insert is ground accordingly and shipped to the site for permanent installation.
Each ceramic orifice insert is finished in the latest CNC machinery, offering unparalleled bore diameter accuracy. All bore diameters are held to a finished tolerance of ±0.002” as standard, with much tighter bore tolerance optionally available.
**SPECIFICATIONS**

**Size Range:** ½" to 14" (available with solid ceramic replaceable insert) 16" to 48" (available only with non-replaceable partially ceramic insert)

**Pressure Class:** ANSI 150 to ANSI 1500

**Maximum Operating Pressure:** 800 psig (ANSI 150 to ANSI 300) 5,000 psig (ANSI 400 and greater)

**Maximum Use Temperature:** 350°F (standard models) 1,000°F (high-temperature models)

**Maximum Instantaneous Differential Temperature:** Alumina Insert - 450°F Silicon Carbide Insert - 700°F

**Materials of Construction**

**Ceramic Insert:** Sintered Silicon Carbide

**Housing:** Stainless Steel 304

**Packing:** Viton®/Teflon®

**Paddle and Hardware:** Stainless Steel 304

**Optional Ceramic Inserts**

Alumina

Nitride-Bonded Silicon Carbide

MgO Partially-Stabilized Zirconia

**Optional Housing:** Stainless Steel 304L / 316L / 2205 / 2207 Carbon Steel Hastelloy-C® FRP

**Optional Packing:** Kalrez®, Grafoil®

**Temporary Orifice Inserts:** Stainless Steel 304L / 316L / 2205 / 2207 Carbon Steel Hastelloy-C® FRP

**Model Number Designation:**

OP — 600 — 2.351 D — A150 — SiC — HT

[1] OP Series
[2] Line Size
[3] Bore Diameter
[4] Bore Geometry:

(Blank) ... Concentric, Square-Edge Bore
E ......... Eccentric Bore
S ......... Segmental Bore
D ......... Include Drain
V ......... Include Vent
M ......... Multiple Bores

[5] End-Connection:

A150 ...... ANSI Class 150
A300 ...... ANSI Class 300
A400 ...... ANSI Class 400
A600 ...... ANSI Class 600
A900 ...... ANSI Class 900
A1500 ...... ANSI Class 1500

[6] Insert Material:

SiC ......... Sintered Silicon Carbide
AL ......... Fine-Grain Alumina
MI ......... Stainless Steel 316
304 ......... Stainless Steel 304
2205 ......... Duplex Stainless Steel
2207 ......... Super Duplex Stainless Steel
FRP ...... FRP

[7] Special Features:

HT ......... High-Temperature
MI ......... Metallic Insert
FRP ...... FRP Housing
SP ......... Special, non-standard option

**DIMENSIONS**

<table>
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<tr>
<th>Size</th>
<th>ØA</th>
<th>ØB</th>
<th>ØC</th>
<th>ØD (Qty)</th>
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<td>3.50&quot;</td>
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<td>4.08&quot;</td>
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</tbody>
</table>

For dimensional drawings on high-pressure orifice plates (greater than ANSI 150 lb), please contact Ceresist.

Dimensions (ANSI 150 lb):

For more information, contact our offices:

Toll-Free: (800) 219-4945
Phone: (973) 345-3231
Fax: (973) 345-3066
sales@ceresist.com
support@ceresist.com

Mailing Address:

Ceresist, Inc.
P.O. Box 213
Hawthorne, NJ 07507-0213

Physical Address:

Ceresist, Inc.
176 East 7th St.
Paterson, NJ 07524-1609

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