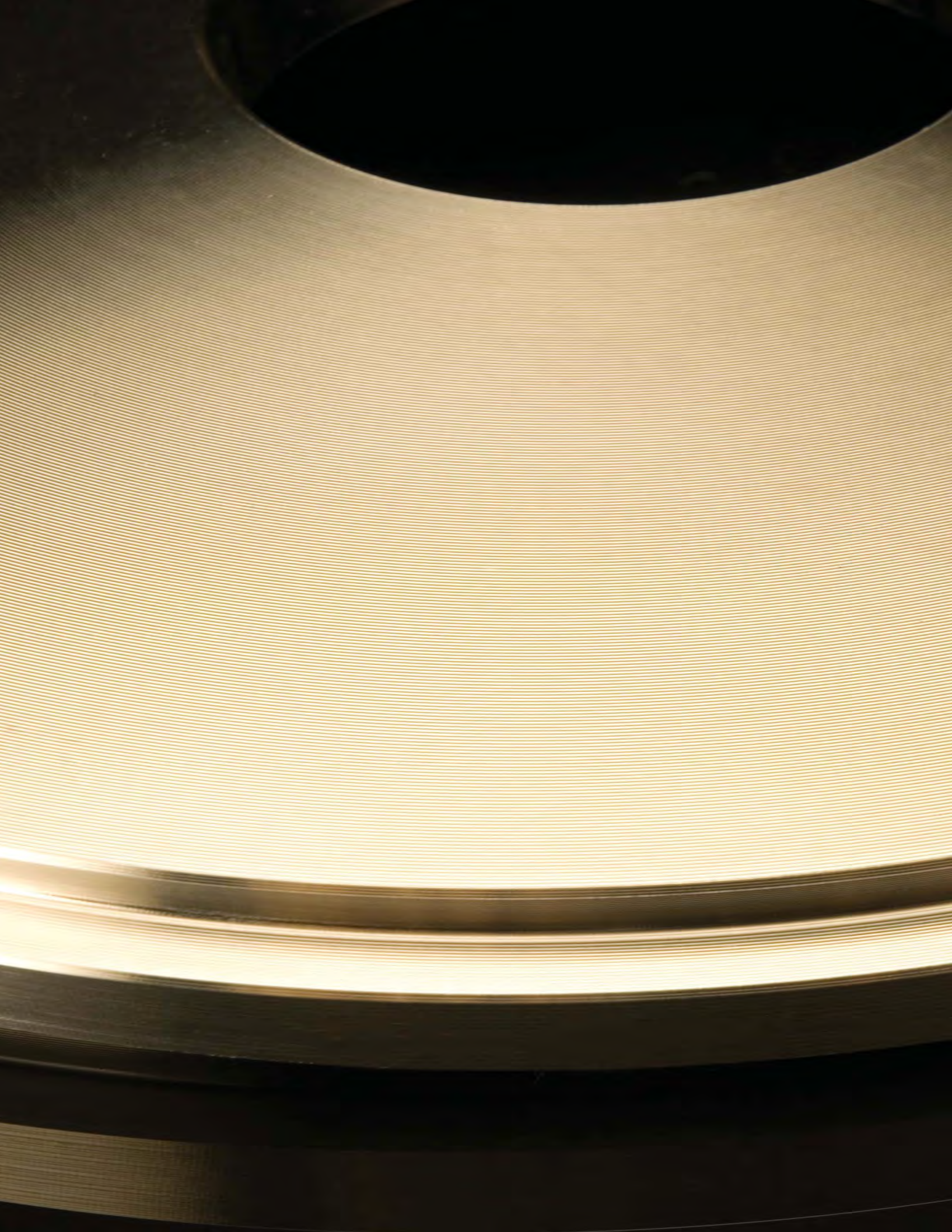


SOLID CERAMIC ORIFICE PLATES





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

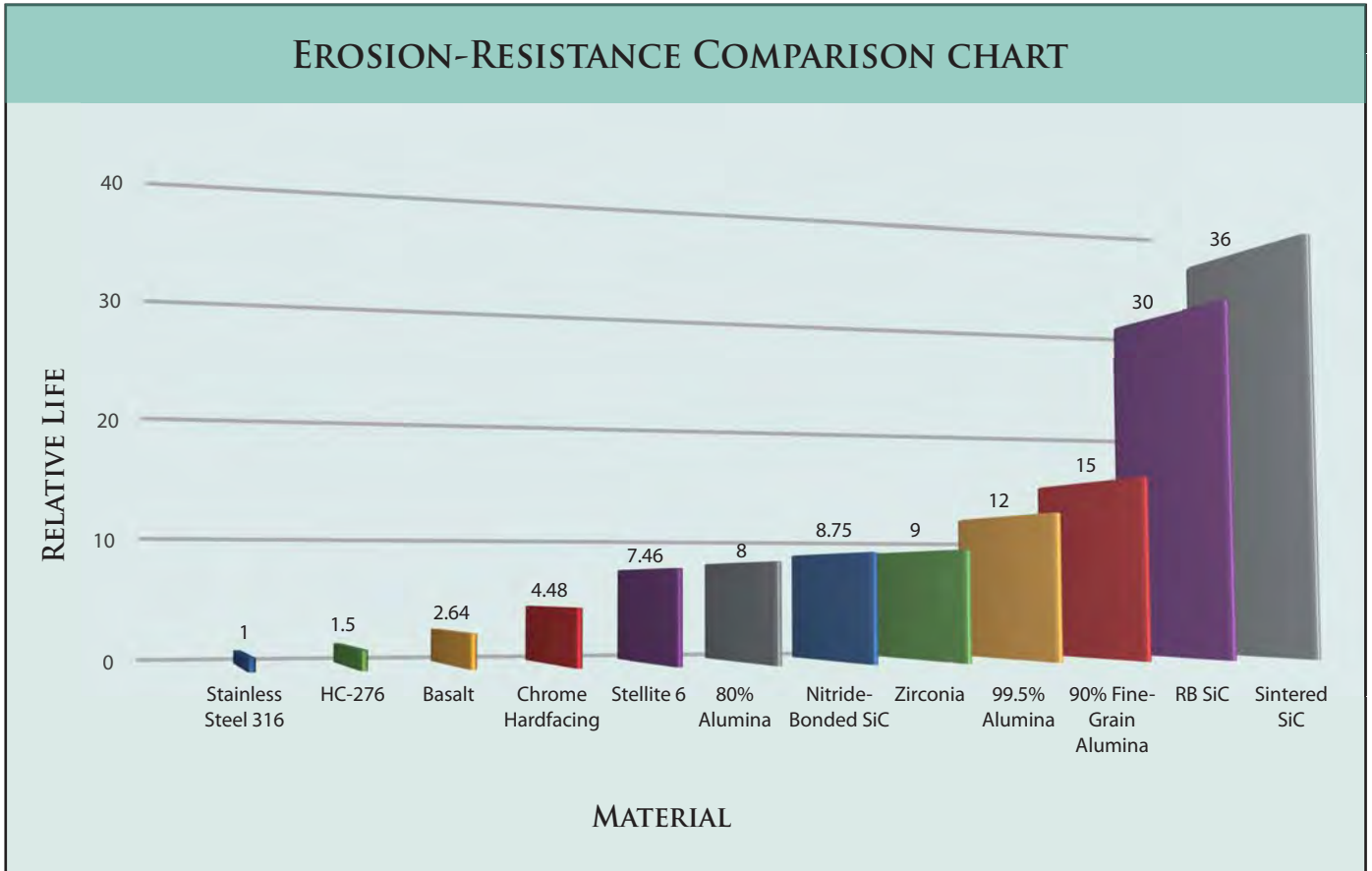
Fluid (Ambient Temperature)	Sintered Silicon Carbide	Partially-Stabilized Zirconia	99.5% Alumina	90% Alumina	SS304	SS316	Stellite® 6	Inconel® 600	Tantalum	Titanium	Hastelloy-C® 276
50% H ₂ SO ₄	A	B	A	B	D	D	D	D	A	D	A
36% HCl	A	B	B	B	D	D	D	D	A	B	B
70% HNO ₃	A	B	A	B	D	D	C	A	A	D	D
50% H ₃ PO ₄	A	B	B	B	C	A	A	A	A	D	A
26% NH ₄ OH	A	A	B	C	A	A	-	A	D	A	A
30% NaOH	A	A	B	C	A	C	-	A	D	D	C

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



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)
3,000 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 / 316 / 316L / 2205 / 2207
Carbon Steel
Hastelloy-C®
FRP

Optional Packing: Kalrez®, Grafoil®

Temporary

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

Model Number Designation:

OP — 600 — 2.351 D — A150 — SiC — HT
[1] [2] [3] [4] [5] [6] [7]

- [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 Bore
- [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

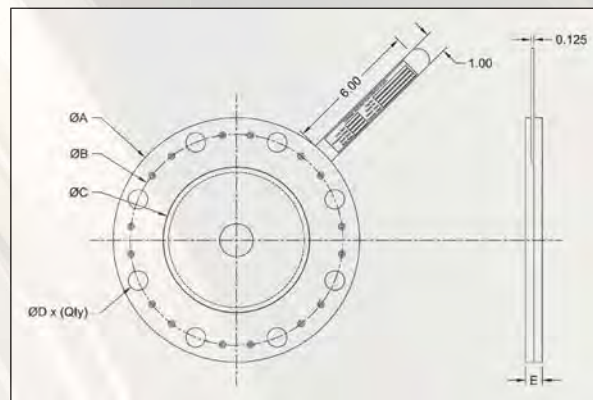
- [6] Insert Material:
 - SiC Sintered Silicon Carbide
 - AL Fine-Grain Alumina
 - MI Stainless Steel 316
 - 304 Stainless Steel 304
 - 2205 Duplex Stainless Steel
 - 2207 Super Duplex Stainless Steel
 - FRP FRP
- [7] Special Features:
 - HT High-Temperature
 - MI Metallic Insert
 - FRP FRP Housing
 - SP Special, non-standard option

DIMENSIONS

Size	ØA	ØB	ØC	ØD (Qty)	E
½"	3.50"	2.38"	0.94"	0.63" (4)	½"
¾"	3.88"	2.75"	0.94"	0.63" (4)	½"
1"	4.25"	3"	1.73"	0.63" (4)	½"
1½"	5.00"	3.48"	1.73"	0.63" (4)	½"
2"	6.00"	4.75"	3.23"	0.75" (4)	½"
3"	7.50"	6.00"	4.39"	0.75" (4)	¾"
4"	8"	7.50"	4.39"	0.75" (8)	¾"
6"	11.00"	9.50"	7.06"	0.88" (8)	¾"
8"	13.50"	11.75"	8.31"	0.88" (8)	¾"
10"	16.00"	14.25"	10.20"	1.00" (12)	¾"
12"	19.00"	17.00"	12.25"	1.00" (12)	1"
14"	21.00"	18.75"	13.75"	1.12" (12)	1"

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

Dimensions (ANSI 150 lb):



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