

# Mott Corporation

## High Purity GasShield<sup>®</sup> Diffuser Products



**mott** corporation

84 Spring Lane, Farmington, CT 06032-3159  
860-747-6333 Fax 860-747-6739  
[www.mottcorp.com](http://www.mottcorp.com)

# Mott Porous Metal Centering Ring Diffusers GSD Series (GasShield® Diffuser)



Figure 1. Cross Section of the Centering Ring Diffuser

- 316LSS Porous Media in Various Grades
- Media Welded and Leak Tested
- Standard Vacuum Connection Sizes

### Sizing Centering Ring Diffusers Selection Guide

- 1) Determine the size Centering Ring using Table 2.
- 2) Choose Media Grade using Table 4 to calculate acceptable flow to pressure drop. Use the Porous Area data in Table 2 to calculate the flux rate of lpm/in<sup>2</sup> by dividing the application flow rate in lpm by the porous area data in in<sup>2</sup>.
- 3) To determine particle collection efficiency of the Media Grade, refer to Table 3. Note that diffusers are primarily used to reduce turbulence in the flow stream and not to reduce particulate. The porous material does however help to reduce particulate. If the need is for diffusion as well as a high level of filtration, see Filter Diffuser on Page 4.
- 4) Build the Catalog Number using Table 1. Note material composition of media, hardware and o-ring for compatibility with the process.

**TABLE 1**

#### MOTT CATALOG NUMBER CONFIGURATION

GSD	Connection Style	O-Ring Code	SS Media Grade Code	Standard Thickness
GasShield Diffuser Series-	CR (Centering Ring)-	16V (NW16 – 304SS/Viton)- 25V (NW25 – 316LSS/Viton)- 40V (NW40 – 316LSS/Viton)- 50V (NW50 – 316LSS/Viton)-	0.2 0.5 1 2 5 10 20	.039" (1.0mm) .047" (1.2mm) .047" (1.2mm) .062" (1.6mm) .062" (1.6mm) .062" (1.6mm) .062" (1.6mm)

**Typical Part No.**  
**GSD-CR-16V-0.2**

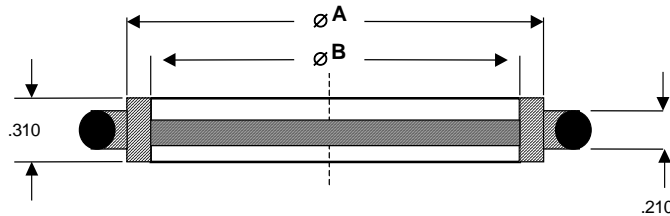


Figure 2. Dimensions

**TABLE 2**

<u>Centering Rings</u>	<u>O-Ring Materials</u>	<u>Body Materials</u>	<u>A OD Inch/mm</u>	<u>B Porous Dia. Inch/mm</u>	<u>Active Porous Area Inch<sup>2</sup></u>
NW-16	Viton	304 SS	0.67 / 17.0	0.63 / 16.0	0.25
NW-25	Viton	316LSS	1.02 / 25.9	0.98 / 24.9	0.60
NW-40	Viton	316LSS	1.61 / 40.9	1.57 / 39.9	1.75
NW-50	Viton	316LSS	2.05 / 52.1	1.97 / 50.0	2.80

# Mott Porous Metal Centering Ring Diffusers GSD Series (GasShield® Diffuser)

## Air Efficiency

**TABLE 3**

Media Grade	Particle Size, $\mu\text{m}$		
	Initial Collection Efficiency		
	90%	99%	99.9%
0.2	<b>A</b>	<b>B</b>	0.2
0.5	<b>A</b>	0.25	0.3
1	<b>A</b>	0.35	0.7
2	0.3	0.6	2
5	0.8	2	5
10	4.5	8	13
20	8	12	20

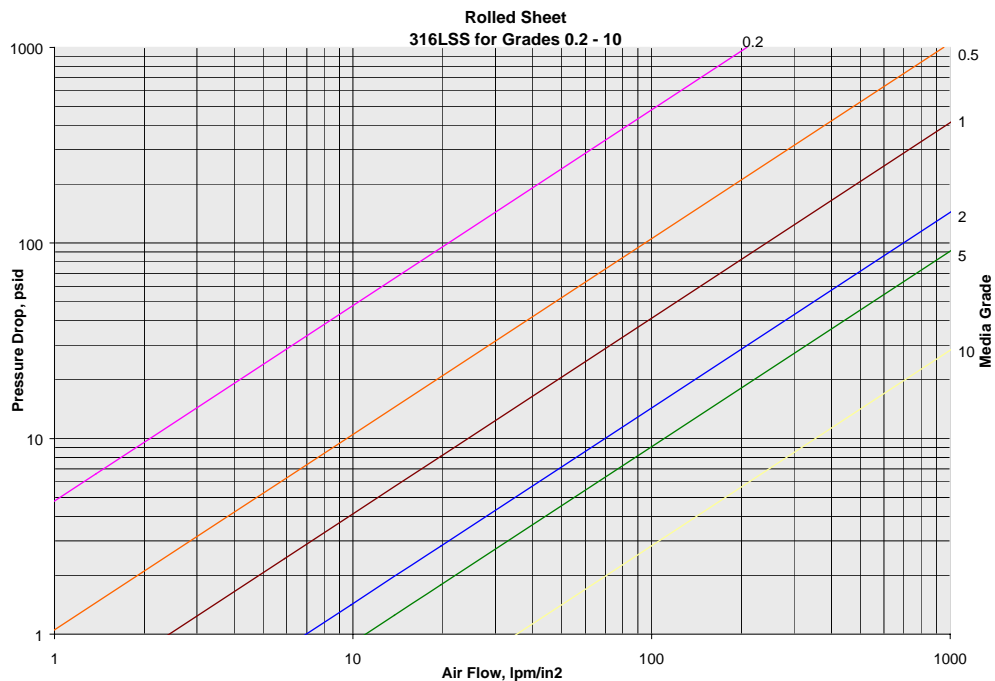
Testing performed per IBR E304

Tested at flux of 1.2 slpm/in<sup>2</sup>

**A** = Initial efficiency is greater than 90% for all particle sizes

**B** = Initial efficiency is greater than 99% for all particle sizes

**TABLE 4**



- |                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Differential pressure varies in direct proportion to sheet thickness. Standard sheet thickness varies with media grade.</li> <li>2. Flow curves are presented in a log-log format; be sure to note the correct numerical values for each log cycle.</li> <li>3. Flow characteristics given are for porous media only.</li> </ol> | <ol style="list-style-type: none"> <li>4. These flow characteristics were derived using 316LSS porous media.</li> <li>5. These flow characteristics are typical and should be used for general reference only.</li> </ol> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# Mott Porous Metal Filter/Diffusers

## GSE Series (GasShield® Filter/Diffusers)

9 log reduction (99.999999%) in particles down to 0.003 µm at rated flow; confirmed at the Most Penetrating Particle Size of 0.08µm.

- 316LSS or Nickel Porous Media
- 316LSS Hardware Connection
- Variety of End Connections

### Sizing Filter Diffusers

- 1) Determine the application flow rate in slpm.
- 2) Choose a Filter Diffuser from Table 6 that has a max flow rating equal to or greater than the application flow rate. Confirm the flow/delta P using Table 5 to confirm that pressure drop is acceptable for system pressures and flows.
- 3) Choose a connection type and build a Catalog Number from Table 6.
- 4) Table 7 defines dimensions per Figure 3. Note material composition of filter media and hardware for compatibility with the process.

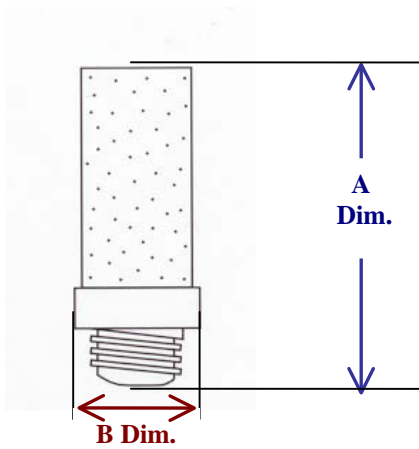
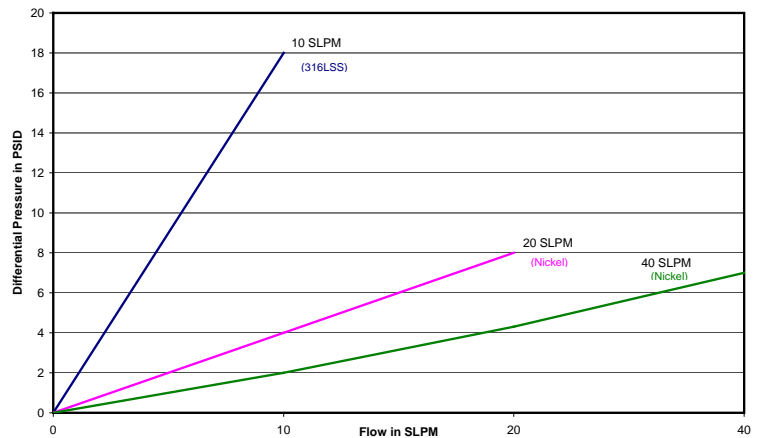


Figure 3. Face Seal

**TABLE 5** Nitrogen Flow vs Differential Pressure  
Mott GSE Series Filter/Diffusers



**TABLE 6**

### MOTT CATALOG NUMBER CONFIGURATION

GSE	Connection Style	Flow Rate/Media Material
GasShield Filter/Diffuser Series-	V1 (1/4" VCR)- T1 (1/4" Tube Stub)-	10S (10 slpm / 316LSS) 20N (20 slpm / Nickel) 40N (40 slpm / Nickel)
<b>Typical Part Number: GSE -V1-10S</b>		

**TABLE 7** (Dimensions)

Flow Rate/ Media Material	Element OD Inch/mm	Element Length Inch/mm	A OAL Inch/mm	B Inch/mm
10 slpm/ 316LSS	0.50 / 12.7	1.50 / 38.1	2.39 / 60.7	0.75 / 19.1
20 slpm / Nickel	0.50 / 12.7	0.75 / 19.1	1.64 / 41.7	0.75 / 19.1
40 slpm / Nickel	0.50 / 12.7	1.50 / 38.1	2.39 / 60.7	0.75 / 19.1

**mott corporation**

84 Spring Lane, Farmington, CT 06032-3159  
860-747-6333 Fax 860-747-6739  
www.mottcorp.com

**Mykron**

Mykron Microelectronics Co., Ltd.

上海资方微电子有限公司  
No.12 Yi, Chao Yang Men Street (North), Beijing, 100020, China  
Tel. (86)10-6551 0500 Fax (86)10-6551 0501  
http://www.mykrons.com



HPDIFFUSERS REV 0 0503