DATA SHEET

CMI POROUS METAL SOLUTIONS

Global Delivery and Fulfillment

The Reliable Company

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Overview

CMI Sintered porous metal media is absolutely reliable, and can be engineered in any way or shape you can imagine.
CMI provides idea solutions for filtration, flow control, sparging and dispersion-for virtually any device or process.

Whether you are flowing gas or liquid, CMI porous metal is the proven, reliable, long-lasting media for efficient particle capture, flow restriction, wicking and gas/liquid contacting. For decades, users of alternative media such as fabric and polymer-based filters have switched over to CMI for the distinct advantages that CMI porous metal provides:

Long Life- In most applications, CMI porous metal maintains high filtration efficiency and structural integrity through years of continuous use.

High strength-CMI media is unsurpassed in tensile strength, making it well suited for high differential pressures and flow rates.

High heat tolerance-All metal construction and welded joints and seams endure high

Material	Max. Temperature in Oxidizing Atmosphere	Max. Temperature in Reducing Atmosphere
SS316L	750℉/399℃	900℉/482℃
Hastelloy C-276	850℉/454℃	1000℉/538℃
Inconel 600	1100℉/593℃	1500℉/815℃
Hastelloy X	1450℉/788℃	1700℉/927℃

Uniform porosity-A strictly controlled sintering process enables CMI to produce uniformly sized and distributed pores, in media grades ranging from 0.1 to 100.

Overview

Fully cleanable-Particles may be removed from CMI media using back pulse and other cleaning methods, restoring the media to its original efficiency for repeated performance.

No media migration- Solid-state diffusion bonding holds filter media together at the molecular level, making it virtually inseparable, even under the harshest conditions.

Wide choice of materials-In addition to SS316L, CMI standard material of construction-customers may choose from many other metals and alloys to meet special requirements such as greater temperature and corrosion resistance:

- Stainless Steel: 316L, 304L, 310, 347 and 430
- Hastelloy: C-276, c-22, X,N,B and B2
- Inconel 600, 625 and 690
- Nickel 200 and Monel 400 (70 Ni-30 Cu)
- Titanium
- Alloy 20
- Others upon required

Besides above features, CMI is able to engineer porous part into the shape customers want.

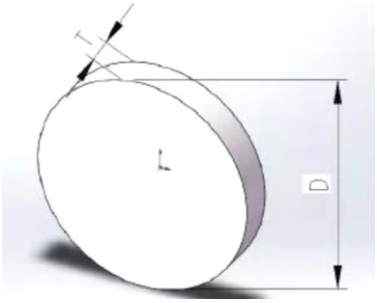
Precise manufacturing helps control a variety of performance characteristics.
Controlling the physical characteristics of CMI media results in still more benefits-controlled performance. By altering shape, porosity, material of construction, and many other factors, CMI can provide complete functional control over a wide range of properties including:

- Mean pore size
- Capillary attraction
- Surface characteristics
- Thermal conductivity
- Density
- Particle size retention
- Mechanical properties
- Permeability

Basic shapes & Designs

Standard shapes of CMI porous metal media offer an expedient, cost-effective means of satisfying application requirements.
NOTE: Tighter tolerances are available for all products shown. Pls. contact CMI to speak with our sales dept. if you have more exacting requirements.
For more information about these or other products, email CMI at: sales@cmi-ly.com
Or visit our website at: www.cmi-ly.com

Discs
CMI porous SS316L discs, series CSPS-D
Code: CSPSD-Dimension-Thickness-Rating



Discs	mm	inch
OD:	5-390mm	0.2-15.4 inch
Thickness:	1-10mm	0.039-0.394 inch
Tolerance of thickness	±0.1mm-±0.35mm	±0.0039-±0.0138 inch
Tolerance of OD	±0.05mm-±0.25mm	±0.002-±0.0098inch
Micron Rating:	0.3-100μ	

Note:

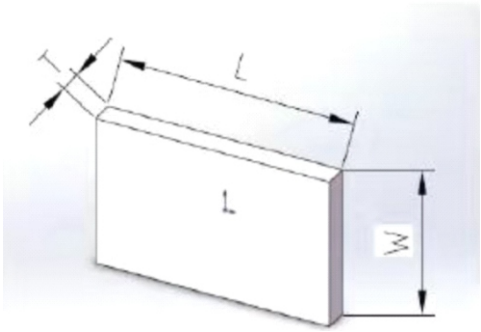
1, Different combinations of dimensions and precision will have different tolerances and thickness
2,Other spec. or tighter tolerance are available upon request, pls. contact CMI at: sales@cmi-ly.com for further information

Basic shapes & Designs

Sheets

CMI porous SS316L sheets, series CSPS-S

Code: CSPSS-Length-Width-Thickness-Rating



Sheets	mm	inch
Length	10-275mm	0.394-10.827inch
Width	10-275mm	0.394-10.827inch
Thickness:	1-10mm	0.039-0.394 inch
Tolerance of thickness	±0.1mm-±0.35mm	±0.0039-±0.0138 inch
Tolerance of Spec.	±0.1mm-±0.25mm	±0.0039-±0.0098 inch
Micron Rating:	0.3-100μ	

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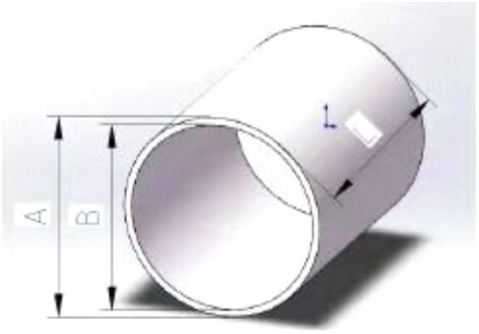
Basic shapes & Designs

Cups

CMI porous SS316L cups, series CSPS-C

Code: CSPSC-OD-Height-Thickness-Rating



Cups	mm	inch
OD:	8-25mm	0.315-0.984inch
Thickness:	1.5-3mm	0.059-0.118inch
Height:	8-35mm	0.315-1.378inch
Tolerance of OD:	±0.2mm	±0.0079inch
Tolerance of Height:	±0.5mm	±0.0197inch
Micron Rating:	0.3-100μ	

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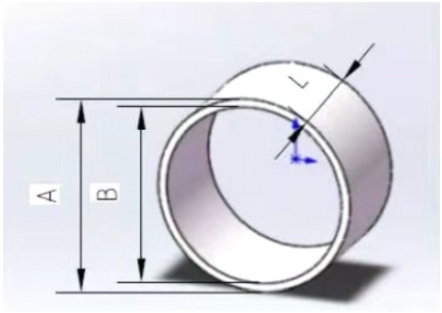
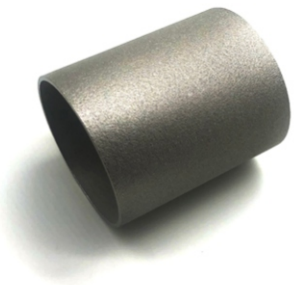
Basic shapes & Designs

Bushings

CMI porous SS316L bushings, series CSPS-B

Code: CSPSB--OD-Height-Thickness-Rating





Bushings	mm	inch
OD:	6-30mm	0.236-1.181inch
Thickness:	1.5-3mm	0.059-0.118inch
Height:	10-40mm	0.394-1.575inch
Tolerance of OD:	±0.2mm	±0.0079inch
Tolerance of height:	±0.5mm	±0.0197inch
Micron Rating:	0.3-100μ	

Note:

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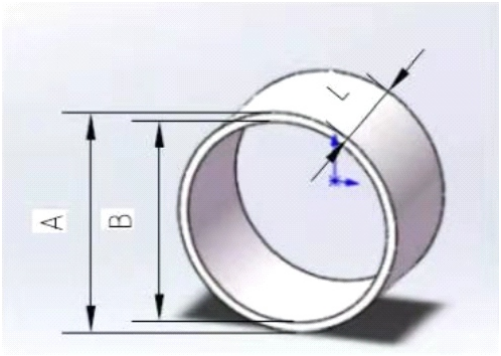
Basic shapes & Designs

Seamless Tubes

CMI porous SS316L, seamless tubes, series CSPS-T

Code: CSPST--OD-Height-Thickness-Rating



Seamless Tubes	mm	inch
OD:	6-150mm	0.236-5.906inch
Thickness:	1.5-5mm	0.059-0.197inch
Length:	200mm-1500mm	7.874-59.055inch
Tolerance of OD:	±1-±2.5mm	±0.039-±0.098inch
Tolerance of Thickness:	±0.3-±0.5mm	±0.0118-±0.0197inch
Micron Rating:	0.3-100μ	

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How to find suitable products?

All porous products, whatever the material of construction, have specific properties which much be taken into account in design and manufacturing processes. Proper attention to these characteristics will help control costs in manufacturing, while at the same time, produce the best combination of properties and performance.

In order to select the best media for any application, one should be able to provide CMI with the following information:

Main application data

- Desired particle retention
- Pressure drop
- Flow rate
- Cleanliness requirements
- Operating fluid-type, density, viscosity
- Process temperature
- System pressure
- Corrosive effects, if any

Main Product considerations

- Mean pore size
- Pore size distribution
- Density

How to achieve different shapes?

OEMs who wish to alter the shape or configurations of CMI products need to be aware of procedural limitations and guidelines to avoid compromising permeability. Listed here are basic considerations:

- Forming-CMI porous metal media has significant ductility, which allows cold forming within certain limits. For example, CMI standard 316L stainless steel filters are formed by cold isostatic pressing. Different pressing machines can make different OD and thickness.

- Machining- Convectional machining will close surface pores, making the machined surface impermeable. It is possible, however, to keep surface pores open with electrical discharge machining (EDM) and subsequent cleaning.
If conventional machining is to be applied, CMI recommends using only water-soluble oils as lubricants.

- Welding-CMI sintered porous metal can be readily welded-to other porous and solid metal parts-as long as certain procedures are followed. Approximately 50% of porous metal consists of voids which tend to collapse under the heat of the welding arc. When this happens, additional metal must be added during the welding process to compensate for the reduced volume.
This can be accomplished with a filler rod, or can be provided in the weld preparation of the mating solid component.
Achieving optimal welds requires proper joint design. Our in-house weld shop had the experiences and expertise to get the job done right. Contact us directly for more information on our services.

How to Clean porous products?

CMI porous metal medial can be cleaned for continuous reuse through a variety of techniques. The best method depends on the application-How the media is used, and what types of gases, liquids and particles are present. The following table shows some of the more common cleaning techniques.

Cleaning recommendations may be obtained by contacting CMI or visit our website: www.cmi-ly.com

Application	Recommended cleaning method
Barrier filter (particulate retained on filter surface)	Reverse flush (clean fluid or gas)
Depth-type filter (particulate entrained particulate within pores)	Ultrasonic cleaning (backflush with solvent first if are nonreactive with the media)
Combustible contaminant	Salt bath at elevated temperature (use nitrogen blanket if bath temperature is > 750 ℉
Barrier and depth contaminant	Oven burning with steam blanket followed by ultrasonic cleaning

Various applications

Air film rolls/air bearings

Function: Guide surface-sensitive webs on a cushion of air during transport

Application Examples: Photographic film, magnetic audio, video or computer tape; pressure-sensitive adhesive tape; metal foils; polyethylene films

Flow Restrictors

Function: Provide laminar flow and precise control/regulation of gas or liquid flows

Application Examples: Flow control of liquid drugs; gas mixing into beverages; safety devices on anesthesia machines; flow control in gas chromatographs, laminar flow elements, flow splitters, calibrated leaks.

Various applications

Breathers/pressure equalizers

Function: Relieve pressure, allows pressure equalization while excluding contaminants.
Application Examples: Vents, vent covers, tank vents, sound/speaker enclosures, mold vents, rate of rise pressure devices.
Note: media can be treated to repel water while maintaining permeability

Instrument filters

Function: Protect critical instruments by providing maximum purity and optimal flow.
Application Examples: In-line filtration, chromatography solvents, protects HPLC pump inlet check valves from particulate.

Flame Arrestors

Function: Prevent flammable gases from burning back to supply source by quenching/cooling flame.
Application Examples: Welding torches, gas cabinets, gas analyzers, electrical enclosures, pressure regulators for flammable gases or oxygen service.

Custom Designs

Purpose: Accommodate applications that require non-standard porous metal shapes, or that call for the integration of one or more welded fittings to create fabricated compinents engineered specifically for application requirements.

Various applications

Silencers

Function: Sound dampening/reduction
Application Examples: Sound attenuation for pneumatic devices

Wicks

Function: Absorb liquids for dispersion, removal or vaporization
Application Examples: Ink adsorption plates, thermal management heat pipes, butane lighters

Spargers

Function: Distribution device for gas/liquid interfacing
Application Examples: Aeration; bulking, carbonation, hydrogenation, oxidation, oxygen stripping ozone delivery

Fluidizers

Function: Uniformly dispenses gas into particle bed
Application Examples: Aeration, heat-treating powder hoppers to aid powder flow by preventing bridging.

Polymer filters

Function: Remove cross-linked and gelled molecules which lead to filament breakage
Application Examples: Nylon 6 and 6.6 Production, polyethylene, rayon