ASFLOW
AEROSPACE & SEMICONDUCTOR FLOW CO., LTD.

금속 다공체 개발 및 응용사례

2018년 2월

박 만 호

www.asflow.com

목 차

ASFLOW 소개

Tube & Pipe

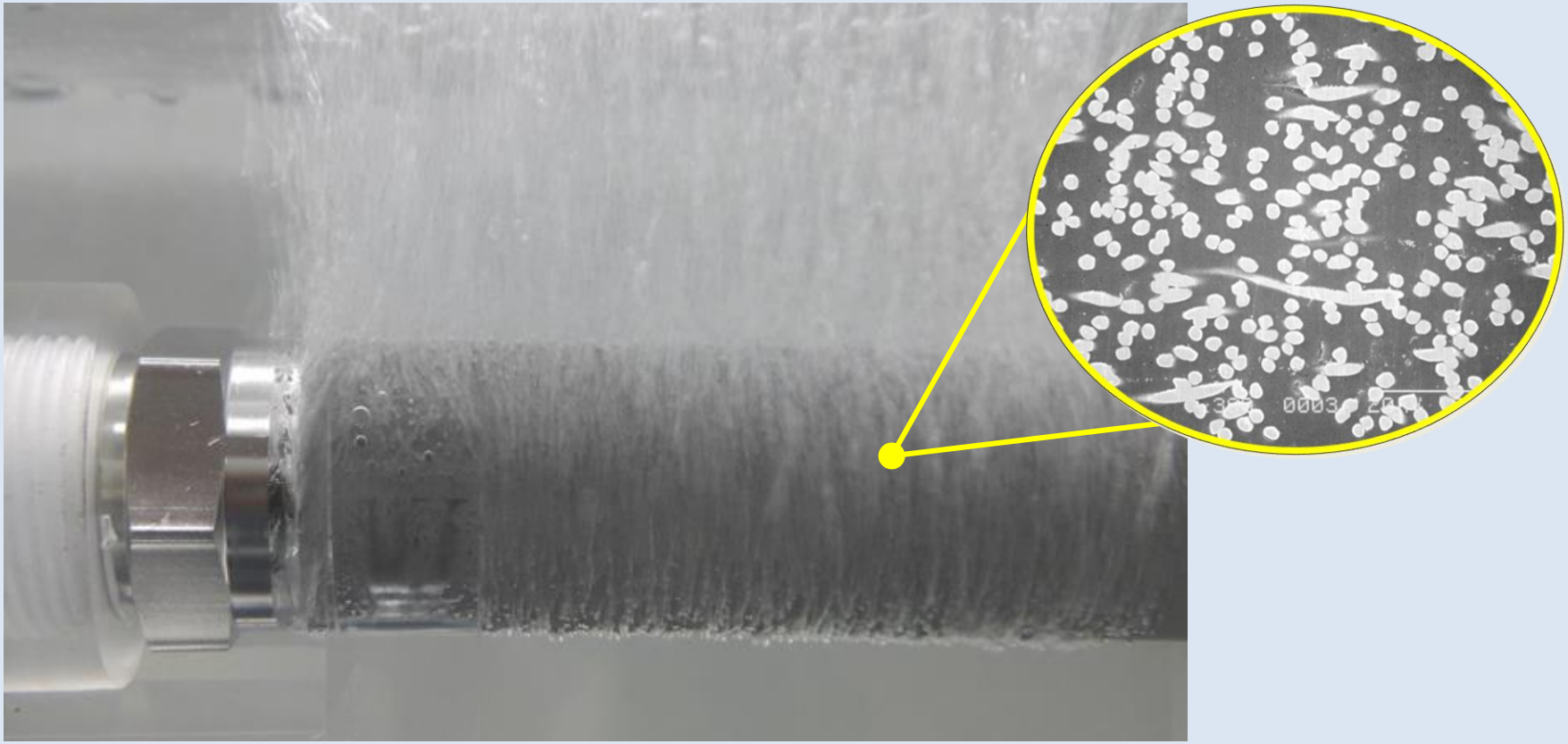
Valve & Regulator

Fittings

Metal Powder Filter

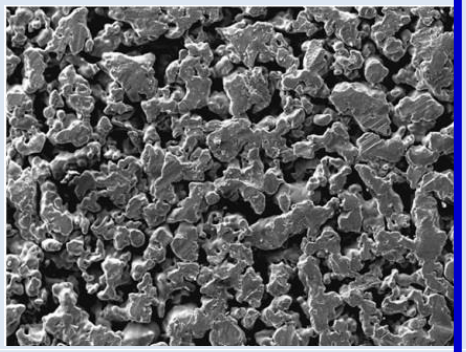
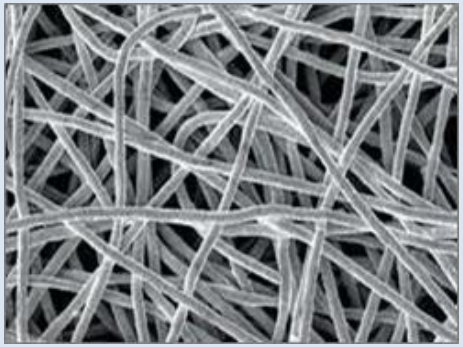
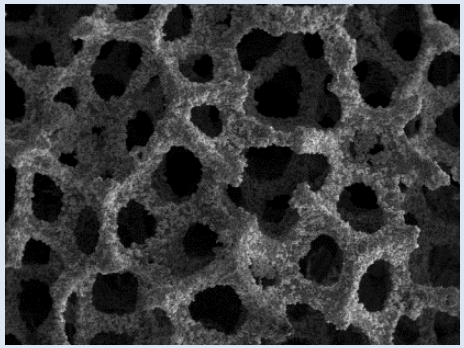
- 반도체 및 디스플레이 생산 공정의 튜브 및 밸브, 레귤레이터, 디퓨저, 필터 등을 공급 중

금속다공체란?

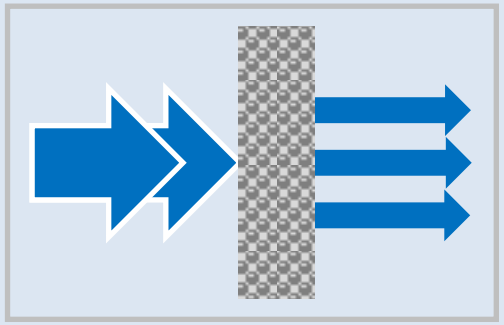


- 소재 내부에 기공이 30% 이상인 소재
- 대표적으로 금속분말 소결체, 금속섬유 소결체, 금속 폼 등이 있음

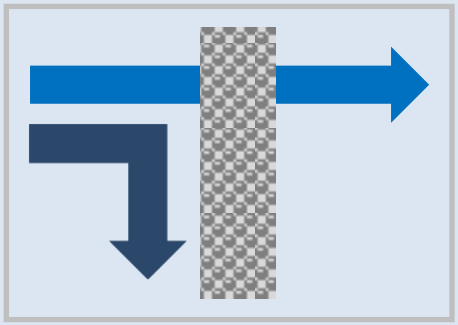
금속다공체의 종류

	Metal powder	Metal fiber	Metal foam
▪ 다공체의 형상			
▪ 기공크기 (㎛)	> 10	> 150	> 100
▪ 기 공 율 (%)	< 60	60-80	> 80
▪ 유체흐름	X	X	O
▪ 고온내구성	높음	낮음	높음
▪ 주 요 기 업	ASFLOW, Porvair, Mott	Bekaert, FiberTech	Sumitomo, Alantum

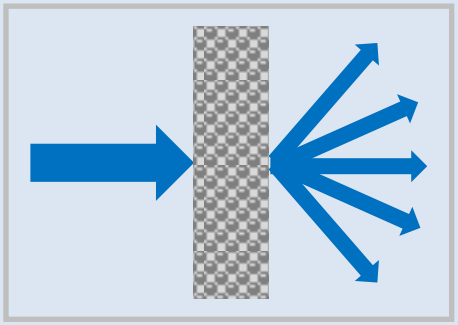
금속다공체의 주요기능



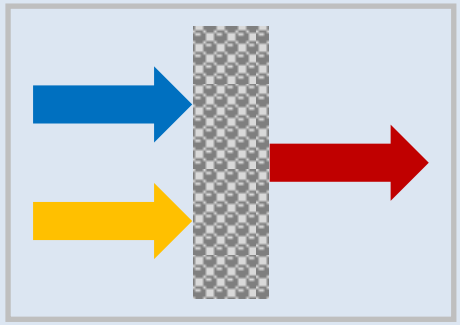
Throttling & Damping



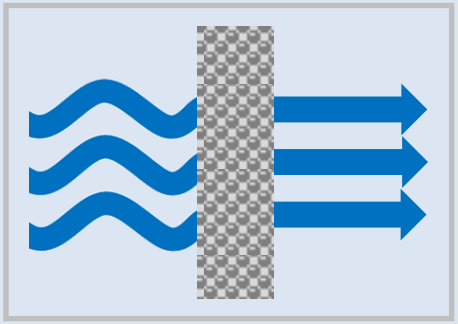
Filtration & Separation



Dispersion

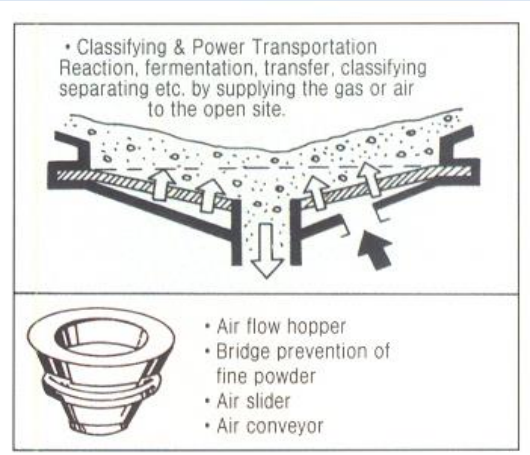


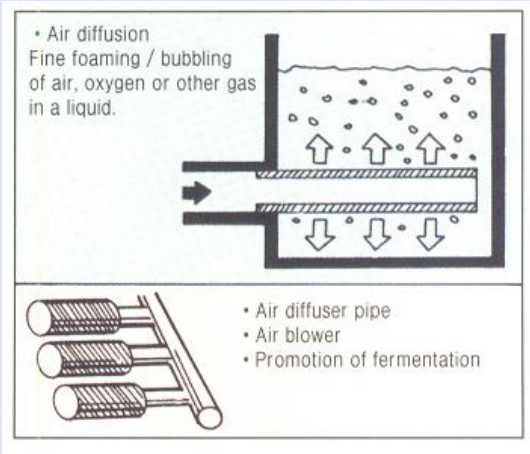
Mixing

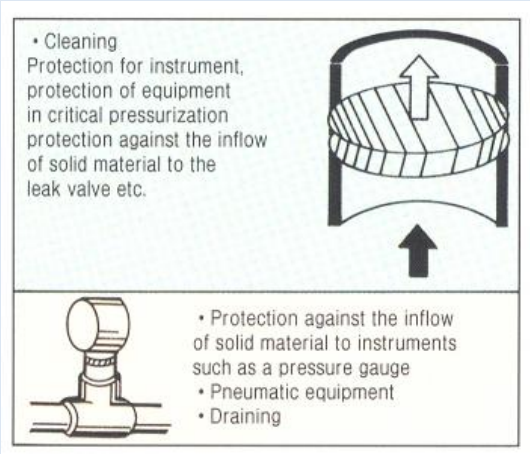


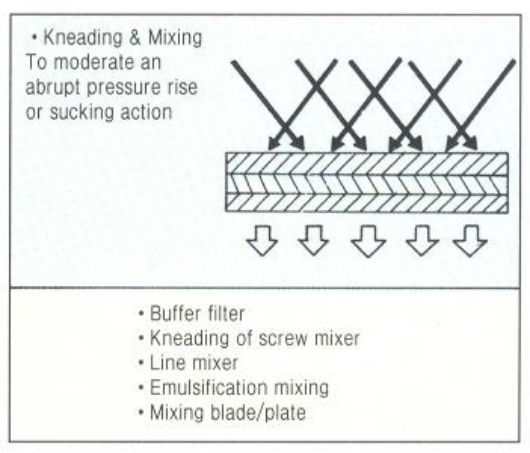
Straightening

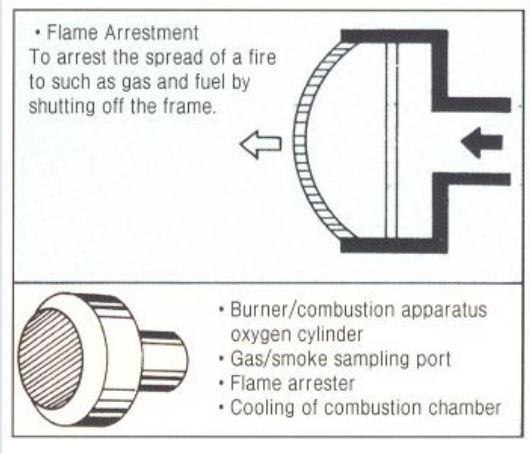
금속다공체의 응용사례

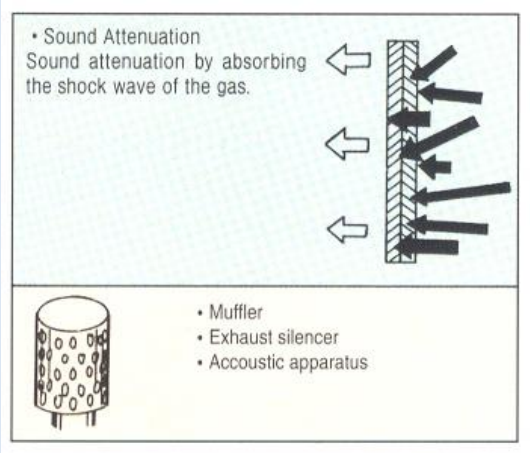








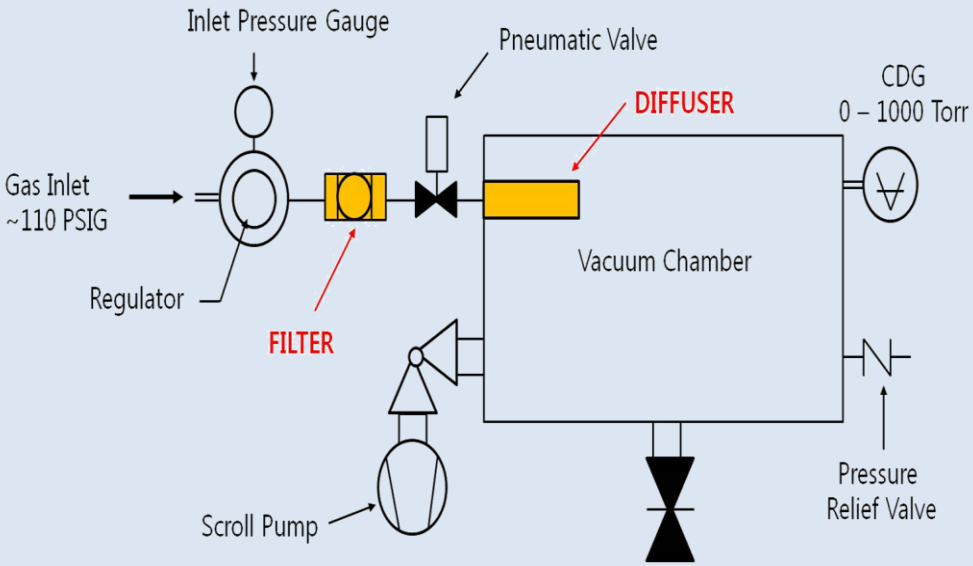


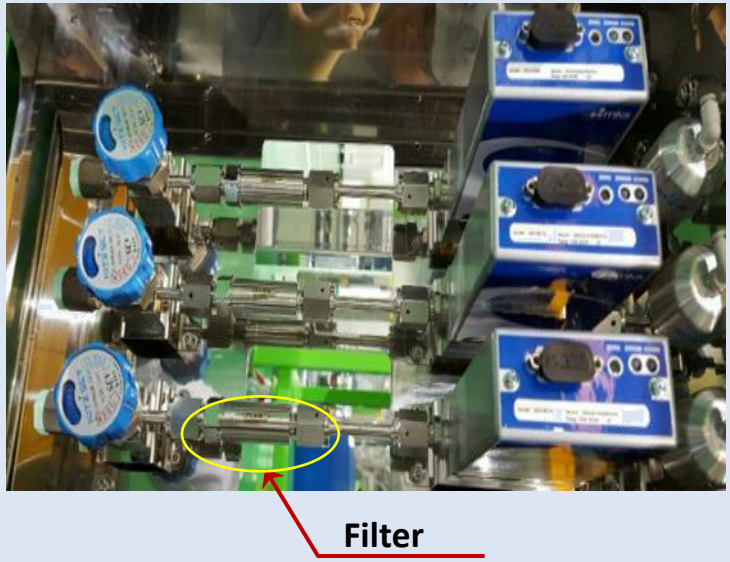


금속분말 다공체 응용사례

- 수㎚ 크기의 분진 여과 및 가스 확산 기능의 Stainless Steel 316L / Hastelloy 금속분말 소결품 공급 중

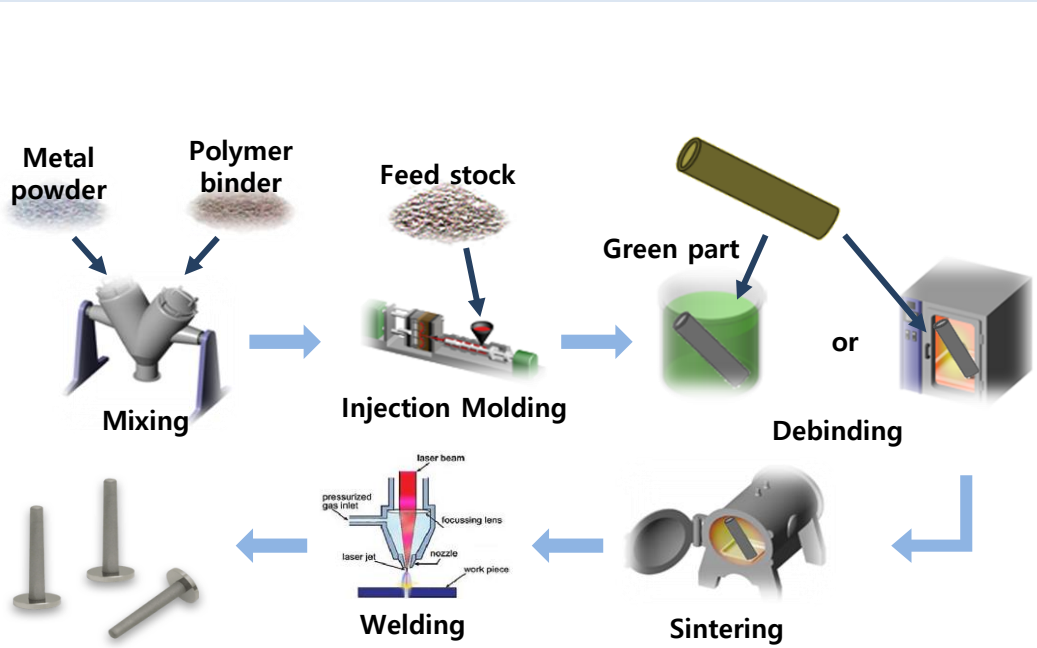
ASFLOW Diffuser / Filter Applications

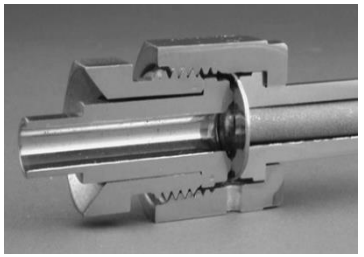


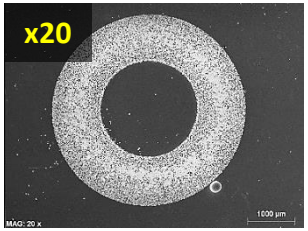


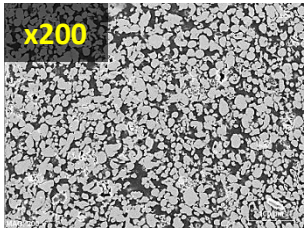
- 반도체 및 디스플레이 생산 장비의 진공 챔버 내외에 설치해서 사용
- 가스 중 이물질을 제거하고, 가스를 균일하게 확산시켜 코팅이 균일해지도록 하는 역할

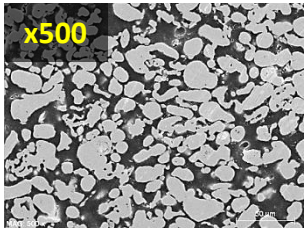
반도체 공정가스 여과용 필터





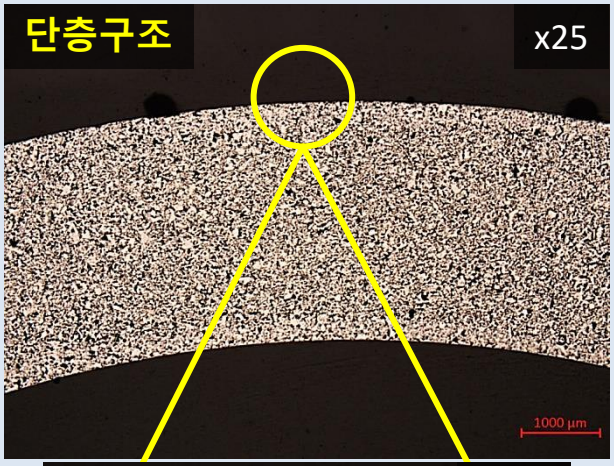


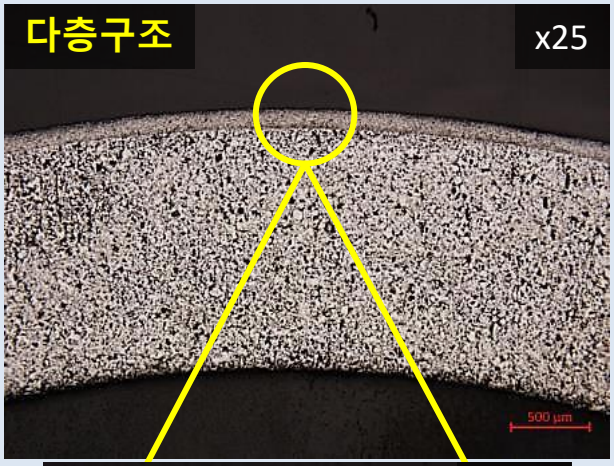




- IGS용 가스켓 필터 개발 (Dimension : Φ 4 – 25L)
- ΔP : 30kPa 이하 (@20LPM)
- 0.3um 입자 제거율 99.9% 이상

반도체 공정가스 여과용 필터



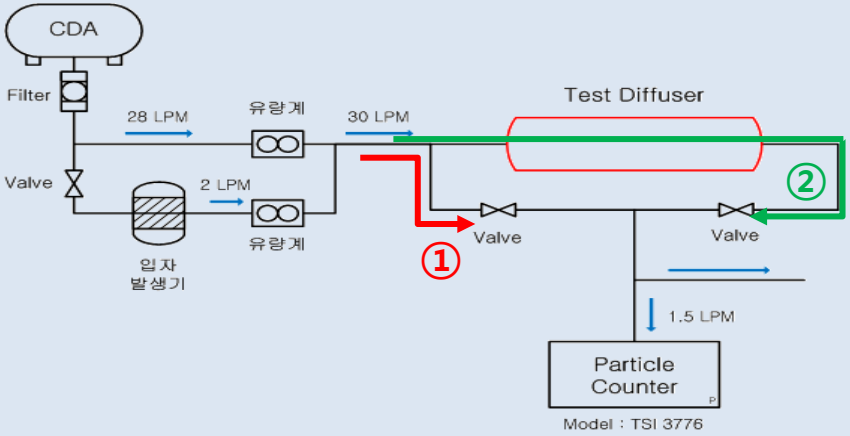


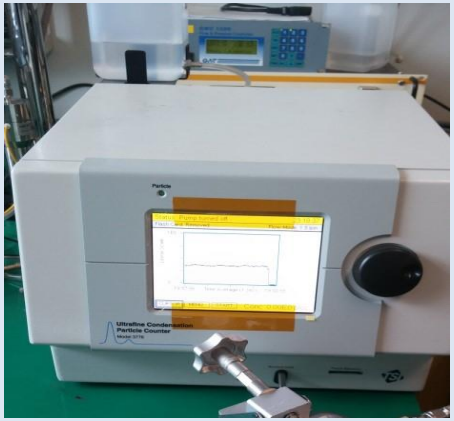
- 미세여과층을 포함하는 다층 구조의 대유량 필터 개발

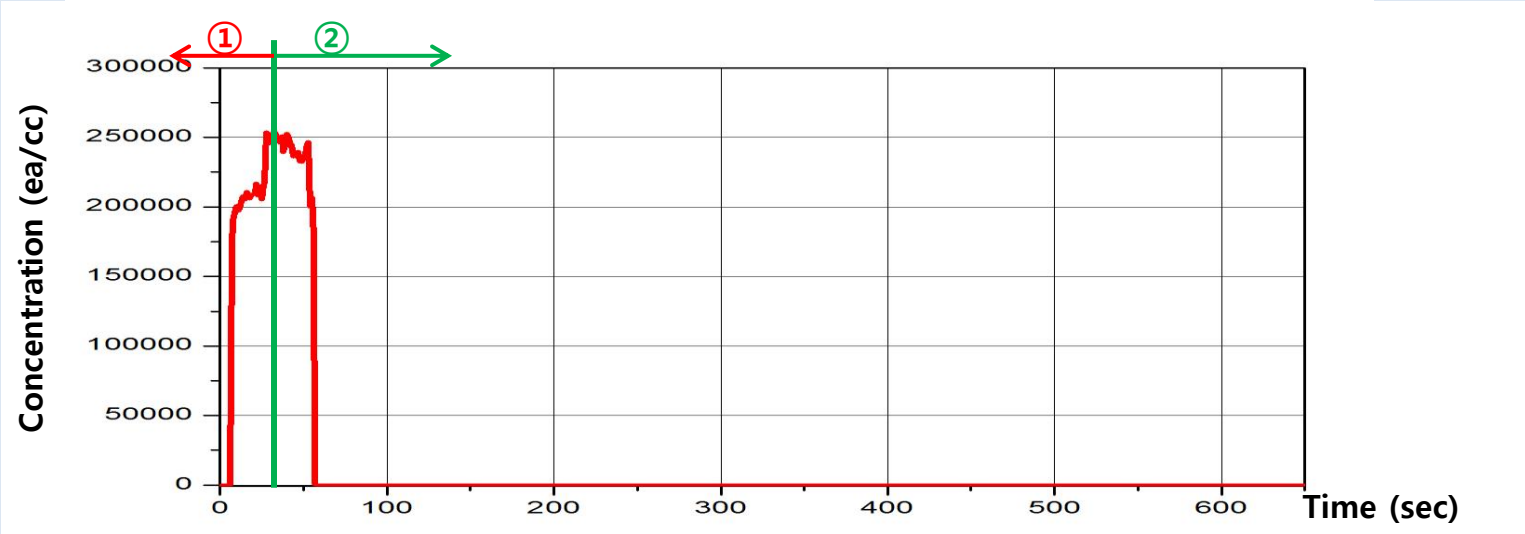
금속분말 다공체 기공율 제어기술

Particle retention

분석장비	**TSI 3776**
분석범위	0.0025 ~ 3 ㎛
검출유량	1.5 LPM
사용물질	Ag (Silver)
입자크기	0.007 ㎛
입자농도	200,000 ea/cc
측정시간	600 sec
사용유량	30 LPM

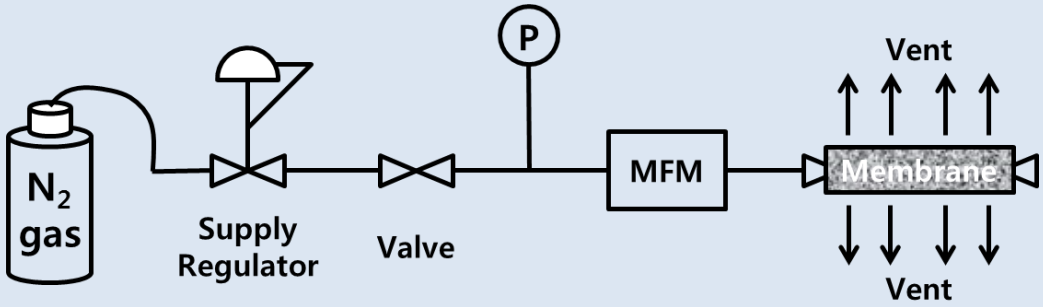


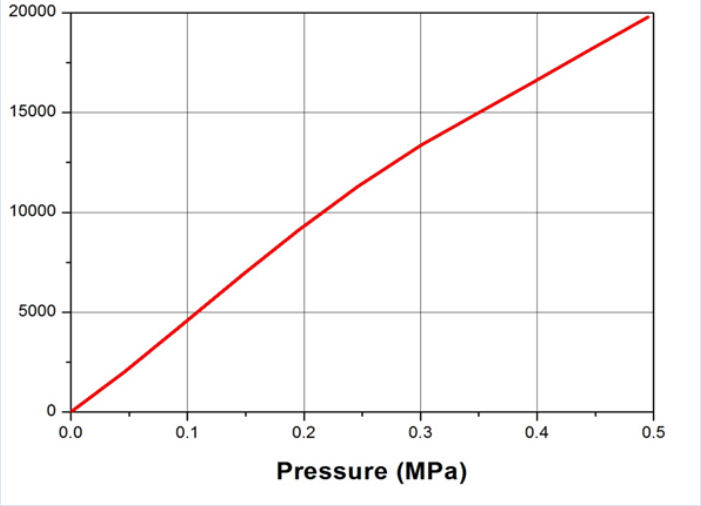


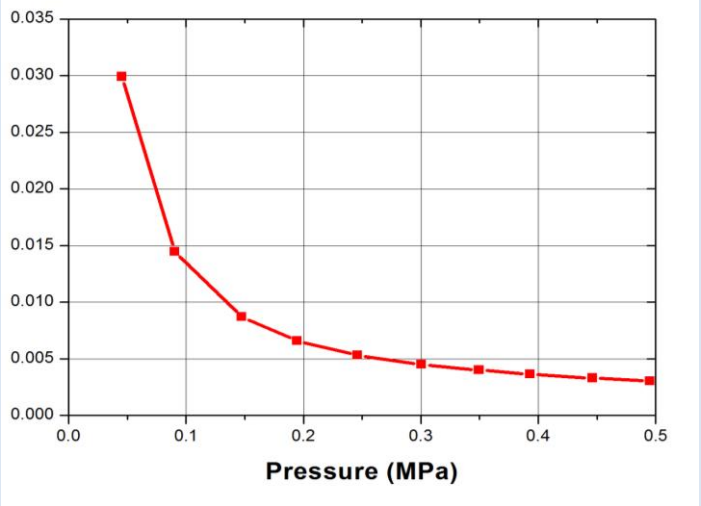


금속분말 다공체 기공율 제어기술

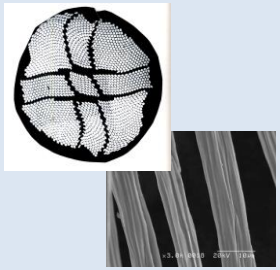
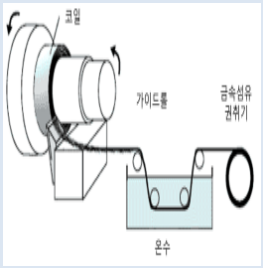
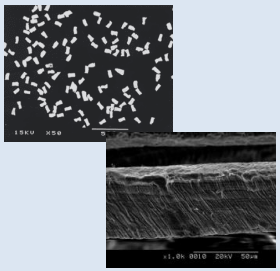
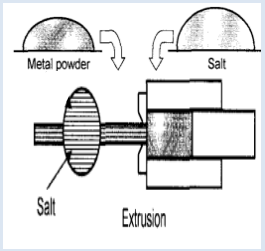
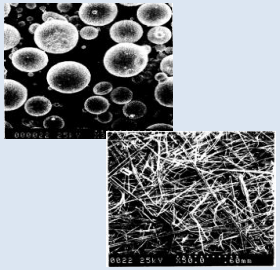
Flow rate

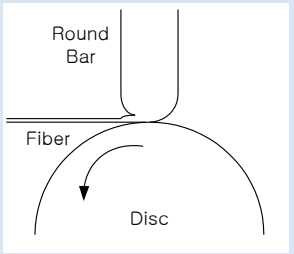
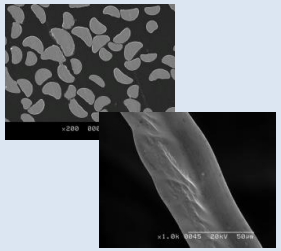
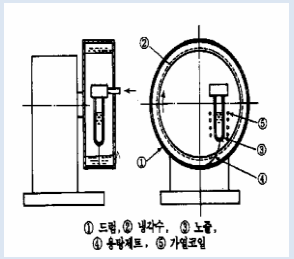
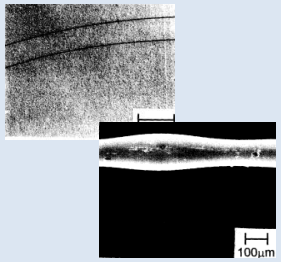




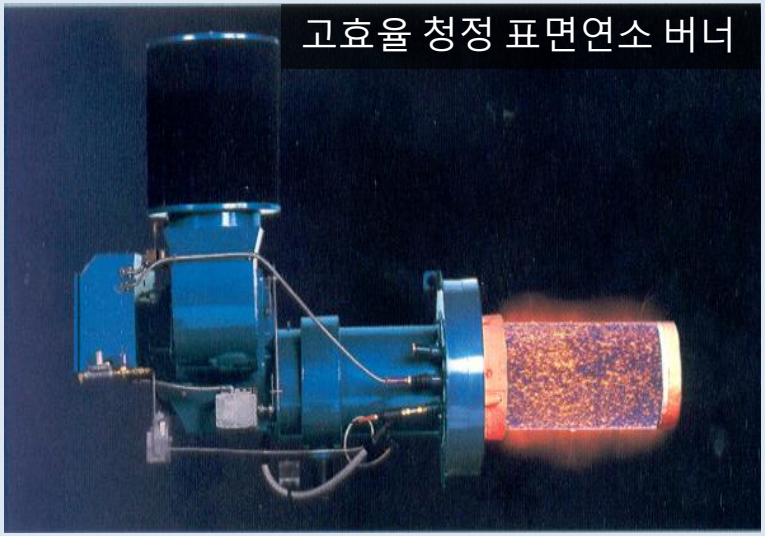


기타 : 금속섬유 제조기술

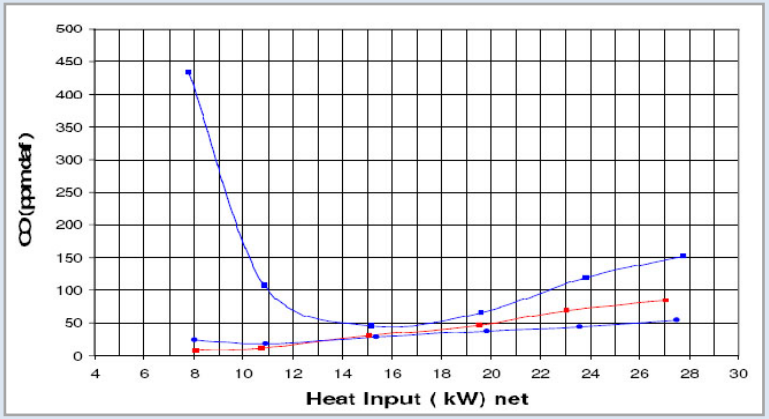
기계가공법	공 법		금속섬유형상	
	다발인발 법 (Bundle Drawing)			
	절삭법 (Shaving)			
	분말압출법 (Powder Extrusion)			

급냉응고법	공 법		금속섬유형상	
	CME 공법 (Crucible Melt Extraction)			
	PDME (Pendant Drop Melt Extraction)			
	In-Rotating-Water-Spinning			

기타 : 금속섬유 다공체 응용사례



면속도 (㎝/s)	집진효율 (%)	선경	압력손실 (Pa)
3.5	99.996 (0.3 ㎛)	1 ㎛	261.55
3.5	99.99 (0.3 ㎛)	2 ㎛	800
1.25	99.983 (0.3 ㎛)	5 ㎛ Fiber	9
1.25	99.05 (0.3 ㎛)	5 ㎛ Powder	74
1.7	98.5 (0.5 ㎛)	5~10 ㎛	-
8.3	97.7 (0.5 ㎛)	5~10 ㎛	-



나가며

진공 장비용 금속필터 / 디퓨저 기술

아스플로가 선도하겠습니다.

“감사합니다!”

Thank you

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