

表 4.1-1 以 VOMAG 系統產生單徑液體微粒測試不同多孔金屬片之內壁損失和收集效率

(a)

W=2.6mm , 3 LPM (S/W=2)				
Oleic Acid				
Dpa ( $\mu\text{m}$ )	$\sqrt{St}$	孔徑 ( $\mu\text{m}$ )	E, %	Loss, %
8	1.2	100	96.23	1.33
		40	96.02	2.52
		20	95.07	2.58
		5	95.94	1.65
		AL	95.05	3.47
6.9	1.03	100	97.70	1.12
		40	96.21	1.49
		20	95.68	1.00
		5	92.95	1.86
		AL	93.59	0.95
6.3	0.945	100	97.96	1.24
		40	98.13	0.93
		20	97.92	0.89
		5	96.59	1.25
		AL	96.43	0.87
4.9	0.738	100	94.99	0.87
		40	92.97	1.45
		20	91.76	0.53
		5	92.46	0.86
		AL	89.55	0.61

(b)

<b>W=3.6mm , 2.5 LPM (S/W=1)</b>				
<b>Oleic Acid</b>				
<b>Dpa (<math>\mu\text{m}</math>)</b>	<b><math>\sqrt{St}</math></b>	<b>孔徑 (<math>\mu\text{m}</math>)</b>	<b>E, %</b>	<b>Loss, %</b>
<b>7.9</b>	<b>0.662</b>	<b>100</b>	94.20	3.25
		<b>40</b>	93.15	3.90
		<b>20</b>	93.21	2.27
		<b>5</b>	93.88	2.60
		<b>AL</b>	95.15	2.05
<b>6.7</b>	<b>0.563</b>	<b>100</b>	96.44	1.41
		<b>40</b>	94.11	1.56
		<b>20</b>	95.89	1.79
		<b>5</b>	94.36	2.13
		<b>AL</b>	93.26	3.94
<b>6</b>	<b>0.505</b>	<b>100</b>	84.97	1.60
		<b>40</b>	83.86	1.70
		<b>20</b>	78.18	1.26
		<b>5</b>	75.51	2.00
		<b>AL</b>	88.30	0.74
<b>4.9</b>	<b>0.413</b>	<b>100</b>	29.01	1.23
		<b>40</b>	11.44	1.20
		<b>20</b>	8.67	1.82
		<b>5</b>	5.61	1.71
		<b>AL</b>	8.64	0.75

表 4.2-1 多孔金屬片和鋁箔在不同噴嘴雷諾數下之 $\sqrt{St_{50}}$ 差異性統計表

W=2.6 mm, S/W=2										
Q (LPM)	Re	AL	100 $\mu\text{m}$	Difference	40 $\mu\text{m}$	Difference	20 $\mu\text{m}$	Difference	5 $\mu\text{m}$	Difference
1.5	782	0.486	0.446	-8%	0.472	-3%	0.492	1%	0.496	2%
2	1042	0.506	0.416	-18%	0.48	-5%	0.494	-2%	0.503	-1%
2.5	1303	0.518	0.415	-20%	0.484	-7%	0.494	-5%	0.517	0%
3	1563	0.515	0.387	-25%	0.468	-9%	0.493	-4%	0.506	-2%
W=3.6 mm, S/W=1										
Q (LPM)	Re	AL	100 $\mu\text{m}$	Difference	40 $\mu\text{m}$	Difference	20 $\mu\text{m}$	Difference	5 $\mu\text{m}$	Difference
2	753	0.446	0.408	-9%	0.45	1%	0.454	2%	0.466	4%
2.5	940	0.463	0.407	-12%	0.452	-2%	0.461	0%	0.467	1%

表 4.2-2 多孔金屬片和鋁箔在不同噴嘴雷諾數下之曲線陡峭度差異性統計表

W=2.6 mm, S/W=2										
Q (LPM)	Re	AL	100 $\mu\text{m}$	Difference	40 $\mu\text{m}$	Difference	20 $\mu\text{m}$	Difference	5 $\mu\text{m}$	Difference
1.5	782	1.066	1.221	15%	1.122	5%	1.075	1%	1.060	-1%
2	1042	1.064	1.262	19%	1.105	4%	1.077	1%	1.067	0%
2.5	1303	1.075	1.260	17%	1.122	4%	1.092	2%	1.069	-1%
3	1563	1.090	1.328	22%	1.161	7%	1.112	2%	1.083	-1%

  

W=3.6 mm, S/W=1										
Q (LPM)	Re	AL	100 $\mu\text{m}$	Difference	40 $\mu\text{m}$	Difference	20 $\mu\text{m}$	Difference	5 $\mu\text{m}$	Difference
2	753	1.081	1.209	12%	1.107	2%	1.081	0%	1.064	-2%
2.5	940	1.070	1.215	14%	1.102	3%	1.085	1%	1.076	1%

表 4.3-1 不同孔隙直徑多孔金屬片之阻力係數

孔隙直徑 ( $\mu\text{m}$ )	100	40	20	5
阻力係數 (K), $\frac{1}{\text{m}^2}$	4.94E+09	4.06E+10	6.87E+10	1.02E+11

