### CMPH – Ceiling Multi Pattern - Horizontal

### Model: CMPH - Ceiling Multi Pattern - Horizontal

The CMPH series of diffusers was developed to increase the acceptable application range of multi-pattern type ceiling outlets, for the reduced volumetric flow levels typically associated with VAV systems.

It is a variation on the basic CMP series with a horizontal blade added to each blade, which increases the induction rate, resulting in rapid mixing of supply and room air, which produces a strong ceiling effect at lower flows, minimising dumping.

These diffusers are also ideal for lower than normal ceiling heights, or low fixed volume air flows such as those usually found in centre zones.

In general, they operate at higher pressure, noise level, and throw distance than the equivalent Model CMP at the same flow.

#### Construction

CMPH series diffusers are ruggedly constructed entirely of aluminium, are lightweight and have no heavy cast, or moulded components. Precision combination corner gussets and braces, keep mitres to a hairline and aluminium rivets hold the core components rigidly together, eliminating the possibility of warping, flexing, or rattling.

Panel diffusers (Type 2 on page 159D) are mechanically secured to steel panels with the unique Holyoake mounting pins, eliminating gaps and producing a super-fine junction between panel and extrusion.

#### Installation

The diffusers frame assembly is installed in the ceiling opening and attached and sealed to the supply duct. The extensive range of cores, all snap in to the frame surrounds, with nickel plated spring steel thumb clips.

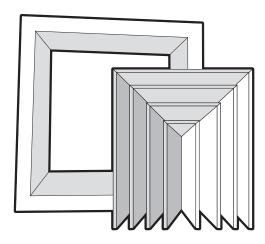
#### **Finish**

All Holyoake aluminium diffusers receive a three stage preparation, prior to final finishing; cleaning, chemical etch and drying. This preparation ensures powder coat adhesion and precludes powder peeling, or flaking after installation.

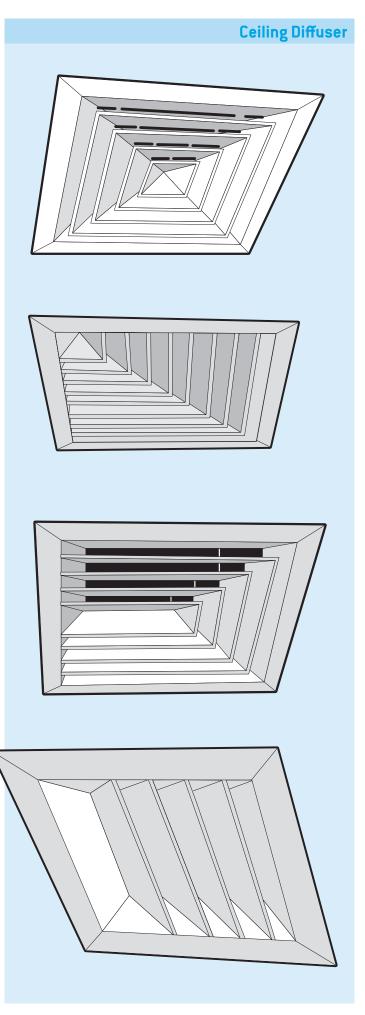
Standard colour is Holyoake White.

#### **Features**

- All aluminium lightweight construction.
- · Precision mitred corners.
- · Selection of frame styles.
- Variety of throw patterns.
- Snap-in interchangeable cores.
- Tough powder coat finish.
- Lightweight Premi-Aire and galvanised cushion head boxes available.



Due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

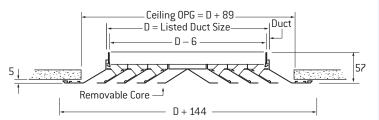


### Ceiling Multi Pattern - Horizontal - CMPH

### Model: CMPH — Ceiling Multi Pattern Diffuser - Horizontal

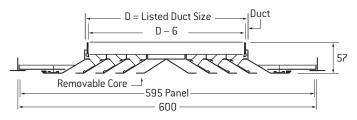
### Standard Flange Frame.

Designed for surface mounting on all types of ceilings, as well as lay-in ceiling tile applications.



#### Panel Diffuser.

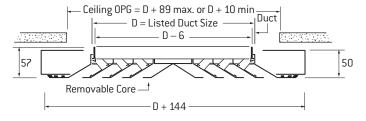
Lay-in type for installation in suspended "T-Rail" type ceilings. Standard panel overall size is  $595 \times 595$  to suit a  $600 \times 600$  grid. Size  $450 \times 450$  has an overall face size of  $595 \times 595$ . It therefore does not require a panel in a 600 grid and fits "T-Rail" spacing with clearance\*.



#### **Drop Frame.**

Lowers the face of the diffuser below the ceiling line. Can be used to reduce smudging, or against obstacles to minimise drafts. Can be supplied in any height from 50-81mm, but unless otherwise specified, frame height of 50 mm will be furnished.

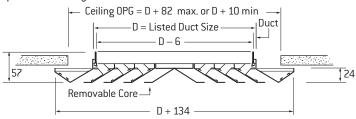
Special order only.



#### **Bevelled Drop Frame.**

Smartly styled bevelled type surround reduces ceiling smudging. For all surface mounting applications.

Special order only.



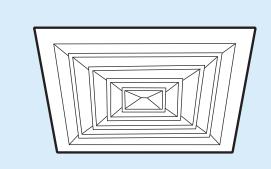
#### Construction

#### **Aluminium:**

0.75mm extruded 6063-T5 aluminium outer frame.

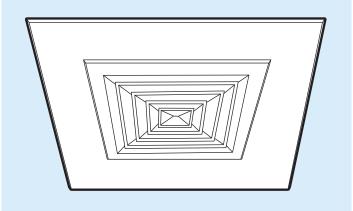
0.55mm removable aluminium core.

Note: 0.75 mm Steel Panel on CMPH Type 2.
 Product weights are shown on page 161D.

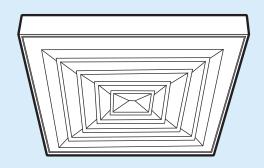


Type 2

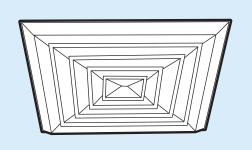
Type 1



Type 3



Type 4



## **CMPH** – Performance Data

Size in mm	Patterns	Neck Vel m/s TP Pa	1.04	1.57 10	2.10 16	2.62 24	3.15 35	3.67 48
	Return NC+1 Factors -SP=1.1 TP	Static Pa  Total m³/s  NC	0.024 - A B	0.036 - A B	0.047 - A B	0.059 - A B	0.071 23 A B	0.083 28 A B
150 x 150	<b>√</b> 41	m³/s side 0.75 throw m 0.50 0.25	0.006 0.5 0.6 0.9	0.008 0.9 1.2 2.7	0.012 1.8 2.4 5.8	0.015 2.7 3.7 6.4	0.017 3.2 4.3 7	0.021 3.4 4.6 7.3
	A 36*	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.005 0.009 0.5 0.7 0.6 0.9 0.9 1.5	0.007 0.014 0.7 1.4 0.9 1.8 2.4 3.7	0.009 0.019 1.4 2.3 1.8 3.0 3.4 6.1	0.012 0.024 2.5 3.0 3.4 4.0 6.1 7.0	0.014 0.028 3.0 3.9 4.0 5.2 6.7 7.9	0.017 0.033 3.4 4.6 4.6 6.1 7.3 8.8
AD 0.023 m <sup>2</sup>	21 51	m³/s side 0.75 throw m 0.50 0.25	0.012 0.9 1.2 1.8	0.018 1.6 2.1 5.2	0.024 2.7 3.7 6.4	0.030 3.2 4.3 7.0	0.035 4.3 5.8 8.5	0.041 4.8 6.4 9.4
	<b>□</b> 11	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.024 0.9 1.2 2.7	0.035 2.3 3.0 6.1	0.047 3.2 4.3 7.0	0.059 4.3 5.8 8.5	0.071 5.0 6.7 9.7	0.083 5.9 7.9 10.4
	Return NC+3 Factors -SP=1.3 TP	Total m³/s NC	0.052 - A B	0.080 - A B	0.106 - A B	0.132 23 A B	0.158 28 A B	0.184 33 A B
225 x 225	<b>41</b>	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.013 0.7 0.9 2.1	0.020 1.6 2.1 5.5	0.026 2.7 3.7 6.4	0.033 4.1 5.5 7.9	0.040 4.3 5.8 8.5	0.046 5.0 6.7 9.7
AD	<b>♣</b> 36*	m³/s side 0.75 throw m 0.50 0.25	0.010 0.021 0.7 0.9 0.9 1.2 1.8 2.7	0.016 0.032 1.6 2.3 2.1 3.0 3.7 6.1	0.021 0.042 2.5 3.2 3.4 4.3 6.1 7.0	0.026 0.053 3.2 4.1 4.3 5.5 7.0 8.2	0.032 0.063 3.7 5.0 4.9 6.7 7.6 9.7	0.037 0.074 4.8 5.9 6.4 7.9 9.1 11.3
AD 0.051 m <sup>2</sup>	21 51	m³/s side 0.75 throw m 0.50 0.25 m³/s side	0.026 1.1 1.5 3.0	0.040 2.5 3.4 6.1	0.053 3.2 4.3 7.0 0.106	0.066 4.3 5.8 8.5 0.132	0.079 5.5 7.3 10.1 0.158	0.092 6.2 8.2 10.7 0.184
	<b>□</b> 11	0.75 throw m 0.50 0.25	1.6 2.1 5.2	3.0 4.0 6.7	4.3 5.8 8.5	5.5 7.3 10.1	6.4 8.5 11.0	7.3 9.7 12.8
	Return NC+5 Factors -SP=1.4 TP	Total m³/s NC	0.094 - A B	0.142 - A B	0.189 - A B	0.236 28 A B	0.283 33 A B	0.330 38 A B
300 x 300	41	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.024 0.9 1.2 2.4	0.035 2.3 3.0 6.1	0.047 3.0 4.0 7.0	0.059 4.3 5.8 8.5	0.071 5.3 7.0 10.1	0.083 5.9 7.9 10.4
AD	Å 36*	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.019 0.038 0.9 1.4 1.2 1.8 2.7 3.4 0.047	0.028 0.057 1.8 2.7 2.4 3.7 5.8 6.4 0.071	0.038 0.076 3.0 3.9 4.0 5.2 5.2 7.9 0.094	0.047 0.094 3.9 5.0 5.2 6.7 7.9 9.7 0.118	0.057 0.113 5.0 5.9 6.7 7.9 9.7 10.4 0.142	0.066 0.132 5.7 6.9 7.6 9.1 10.1 12.2 0.165
0.090 m²	21 51	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	1.6 2.1 5.2	3.0 4.0 7.0	4.1 5.5 8.5	5.3 7.0 10.1 0.236	6.4 8.5 11.0	7.1 9.4 12.5
	▶ 11	m³/s side 0.75 throw m 0.50 0.25	2.3 3.0 6.1	3.9 5.2 7.9	0.189 5.5 7.3 10.1	6.4 8.5 11.6	7.3 9.7 12.8	8.0 10.7 14.9
	Return NC+5 Factors -SP=1.9 TP	Total m³/s NC	0.146 - A B	0.222 - A B	0.295 - A B	0.368 28 A B	0.441 33 A B	0.514 38 A B
375 x 375	<b>√</b> ► 41	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.036 1.4 1.8 3.4 0.029 0.059	0.055 2.7 3.7 6.4 0.044 0.089	0.074 3.9 5.2 7.9 0.059 0.118	0.092 5.0 6.7 9.7 0.074 0.147	0.110 5.9 7.9 10.4 0.088 0.177	0.128 6.6 8.8 11.9 0.103 0.206
AD	♣ 36*	m³/s side 0.75 throw m 0.50 0.25	1.1 1.8 1.5 2.4 3.0 5.8	2.5 3.2 3.4 4.3 6.1 7.0	3.4 4.6 4.6 6.1 7.3 9.1 0.147	4.8 5.7 6.4 7.6 9.4 10.1 0.184	5.5 6.9 7.3 9.1 10.1 12.2 0.220	6.4 7.8 8.5 10.4 11.0 14.3
0.141 m²	21 51	m³/s side 0.75 throw m 0.50 0.25 m³/s side	1.8 2.4 5.8	3.4 4.6 7.3	5.0 6.7 9.7 0.295	5.9 7.9 10.4 0.368	7.1 9.4 12.5	7.5 10.1 14.3
	<b>■</b> 11	0.75 throw m 0.50 0.25	2.7 3.7 6.4	4.6 6.1 8.8	5.9 7.9 10.4	7.1 9.4 12.5	8.0 10.7 14.9	18.5 11.3 15.5
	Return NC+7 Factors -SP=2.2 TP	Total m³/s NC	0.212 - A B	0.319 - A B	0.425 - A B	0.531 28 A B	0.637 33 A B	0.743 38 A B
450 x 450	<b>√</b> 41	m³/s side 0.75 throw m 0.50 0.25	0.053 1.6 2.1 4.9	0.080 3.2 4.3 7.0	0.106 4.3 5.8 8.5	0.133 5.5 7.3 10.1	0.159 6.4 8.5 11.6	0.186 7.5 10.1 13.7
4.5	Å 36*	m <sup>3</sup> /s side 0.75 throw m 0.25 0.25	0.042 0.085 1.6 2.3 2.1 3.0 4.3 6.1	0.064 0.127 3.0 3.4 4.0 4.6 6.7 7.3	0.085 0.170 4.3 5.0 5.8 6.7 8.5 9.7	0.106 0.212 5.0 6.2 6.7 8.2 9.7 11.3	0.127 0.255 6.2 7.3 8.2 9.7 10.7 12.8	0.149 0.297 7.1 8.0 9.4 10.7 12.5 14.9
AD 0.202 m <sup>2</sup>	21 51	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.106 2.5 3.4 6.1	0.159 3.9 5.2 7.9	0.212 5.5 7.3 10.1	0.265 6.6 8.8 11.9	0.319 7.5 10.1 13.7	0.371 8.2 11.0 15.2
	<b>11</b>	m³/s side 0.75 throw m 0.50 0.25	0.212 3.2 4.3 7.0	0.319 5.0 6.7 9.7	0.425 6.4 8.5 11.3	0.531 7.5 10.1 13.7	0.637 8.2 11.0 15.2	0.743 8.7 11.6 16.8

 $<sup>^{\</sup>ast}$  These cores are constructed to give as near as possible equal air flow in A & B directions.

## Performance Data – CMPH

Size		Patte	rnc		Neck Vel m/s		1.04		1.57		2.10		2.62		3.15		3.67	
in mm		ratte	IIIS		TP Pa		4		10		16		24		35		48	
					Static Pa		3		8		13		20		30		40	
	Return	NC+9			Total m³/s NC		0.288		0.434		0.578 28		0.722 33		0.866 38		1.010 43	
	Factors	-SP=2	2.7 11				Δ	В	A	В	Δ	В	A	В	Δ	В	A	В
			_		m³/s side		0.072		0.109		0.144		0.180		0.217		0.252	
525		•		41		0.75 0.50	1.8 2.4		3.4 4.6		5 6.7		5.9 7.9		7.1 9.4		8 10.7	
x 525					throw m	0.50	5.8		7.3		9.7		10.4		12.5		14.9	
			À		m³/s side		0.058	0.115	0.087	0.174	0.116	0.231	0.144	0.289	0.173	0.346	0.202	0.404
			■ A	36*			1.8	2.7 3.7	3.2	4.1	4.6	5.7	5.5 7.3	6.9 9.1	6.4	7.5	7.5	8.2
				30 .	throw m	0.50 0.25	2.4 5.8	6.4	4.3 7.0	5.5 8.2	6.1 8.8	7.6 10.1	7.3 10.1	12.2	8.5 11.3	10.1 13.7	10.1 13.4	11.0 15.5
AD			▼ B		m³/s side		0.144		0.217		0.289		0.361		0.433		0.505	
0.276		24		F4		0.75	2.7		4.3		5.9 7.9		7.1 9.4		7.8		8.5	
m²		21		51	throw m	0.50 0.25	3.7 6.4		5.8 8.5		10.4		9.4 12.5		10.4 14.6		11.3 15.8	1
	•				m³/s side		0.288		0.434		0.578		0.722		0.866		1.010	
				11		0.75	3.4		5.5		7.1		8.0		8.7		9.1	
					throw m	0.50 0.25	4.6 7.3		7.3 10.1		9.4 12.5		10.7 14.9		11.6 16.2		12.2 17.4	
	Return	NC+9			Total m³/s		0.378		0.566		0.755		0.944		1.133		1.321	
	Factors		2.83 TP		NC		-		-		28		33		38		43	
			<u> </u>		m³/s side		0.094	В	0.142	В	0.189	В	0.236	В	0.283	В	0.330	В
600				41	111 / 3 3140		2.5		3.9		5.5		6.4		7.5		8.2	
X 600				41	throw m	0.50	3.4		5.2 7.9		7.3		8.5		10.1		11.0	
600			Y		m³/s side	0.25	6.1 0.076	0.151	0.113	0.227	10.1 0.151	0.302	11.3 0.189	0.378	13.7 0.227	0.453	15.5 0.264	0.529
			<b>≜</b> A		III / S SIGE		1.8	3.0	3.4	4.6	5.0	5.9	5.9	7.3	7.1	8.0	7.8	8.5
				36*	throw m	0.50	2.4 6.1	4.0 6.7	4.6 7.3	6.1 9.1	6.7 9.7	7.9 10.4	7.9 10.4	9.7 12.8	9.4 12.5	10.7 14.9	10.4 14.3	11.3 15.8
AD			▼B		m³/s side	0.25	0.188	b.r	0.283	9.1	9.r 0.378	10.4	0.472	12.0	0.566	14.9	0.661	15.0
0.36					111 / 3 3140		3.0		5.0		6.6		7.5		8.2		8.7	
m <sup>2</sup>		21		51	throw m	0.50	4.0 6.7		6.7 9.7		8.8 11.3		10.1 13.7		11.0 17.4		11.6	
	_		и		m³/s side	0.25	0.378		9.r 0.566		0.755		0.944		1.133		16.8 1.321	
				4.4	/ 5 5 14 5		3.9		5.9		7.3		8.7		8.9		9.6	
				11	throw m	0.50	5.2 7.9		7.9 10.4		9.7 13.1		11.6 15.8		11.9 17.1		12.8 18.0	
	Return	NC+9			Total m <sup>3</sup> /s	0.25	0.477		0.717		0.956		1.194		1.432		1.671	
	Factors		3.3 TP		NC						28		33		38		43	
					m³/s aida		0.119	В	A 0.179	В	A 0.239	В	A 0.298	В	0.358	В	A 0.418	В
675				4.4	m³/s side	0.75	2.7		4.6		5.7		6.9		7.8		8.5	
X		•		41	throw m	0.50	3.7		6.1		7.6		9.1		10.4		11.3	
675					m³/s side	0.25	6.4 0.095	0.191	9.1 0.143	0.287	10.4 0.191	0.382	12.2 0.239	0.478	14.6 0.286	0.573	15.8 0.334	0.668
			<u>Α</u> Δ		ni /s side		2.3	3.0	3.9	5.0	5.5	6.4	6.4	7.5	7.5	8.5	8.0	8.7
				36*	throw m	0.50	3.0	4.0	5.2	6.7	7.3	8.5	8.5	10.1	10.1	11.3	10.7	11.6
AD			₹		m³/s side	0.25	6.4 0.238	7.0	7.9 0.359	9.7	10.1 0.478	11.6	11.3 0.597	13.7	13.7 0.716	15.5	14.9 0.835	16.2
0.456			_		mi /s side		3.2		5.5		7.3		7.8		8.7		8.9	
m <sup>2</sup>		21		51	throw m	0.50	4.3		7.3		9.7		10.4		11.6		11.9	
					m³/s side	0.25	7.0 0.477		10.1 0.717		12.2 0.956		14.6 1.194		16.2 1.432		17.4 1.671	
				4.4	III / S Side		4.3		6.4		7.5		8.9		9.1		10.1	
				11	throw m	0.50	5.8		8.5		10.1		11.9		12.2		13.4	
825	Poturn	NC -0			Total m³/s	0.25	8.5 0.713		11.3 1.071		14.3 1.428		16.5 1.784		17.4 2.140		18.6 2.497	
X	Return Factors	NC+9	3.5 TP		NC NC		-		23		28		33		38		43	
825	1 40(015	- 31 -	A		m <sup>3</sup> /a aida		A 0.178	В	A 0.268	В	A 0.357	В	A 0.446	В	A 0.535	В	A 0.624	В
AD				41	m³/s side		3.0		4.8		6.6		7.5		8.0		8.7	
0.681				41	throw m	0.50	4.0		6.4		8.8		10.1		10.7		11.6	
m <sup>2</sup>						0.25	7.0		9.7		11.3		13.1		14.9		16.2	

 $<sup>^{\</sup>ast}$  These cores are constructed to give as near as possible equal air flow in A & B directions.

Guide Product Weights									
Approximate Weight in Kg.									
Size	CMPH141	CMPH241							
150 x 150	0.53	2.77							
225 x 225	0.91	2.84							
300 x 300	1.33	2.89							
375 x 375	1.79	2.94							
450 x 450	2.35	3.05							

## **CMPH** – Performance Data

Size in mm	Patterns	Neck Vel m/s TP Pa	1.04 4	1.57 10	2.10 16	2.62 24	3.15 35	3.67 48
	Return NC+0 Factors -SP=1.3 TP	Static Pa  Total m³/s  NC	0.035 -	0.052 -	0.071 -	20 0.087 23	0.104 28	0.123 33
150 X	42 43 B 43	m <sup>3</sup> /s side 0.75 throw m 0.50	A B 0.012 0.006 0.7 0.5 0.9 0.6	A B 0.017 0.008 1.4 0.9 1.8 1.2	A B 0.024 0.012 2.6 1.8 3.4 2.4	A B 0.029 0.015 3.2 2.8 4.3 3.7	A B 0.035 0.017 4.1 3.2 5.5 4.3	A B 0.041 0.020 4.8 3.5 6.4 4.6
225	31	0.25 m <sup>3</sup> /s side 0.75 throw m	2.1 0.9 0.014 0.007 0.7 0.5 0.9 0.6	4.3 2.7 0.021 0.010 1.6 1.1 2.1 1.5	6.1 5.8 0.030 0.012 2.8 1.8 3.7 2.4	7 6.4 0.037 0.015 3.5 2.8 4.6 3.7	8.2 7 0.044 0.018 4.4 3.5 5.8 4.6	9.4 7.3 0.052 0.021 5.0 3.9 6.7 5.2
	32	0.25 m <sup>3</sup> /s side 0.75	1.8 1.2 0.013 0.011 0.7 0.7 0.9 0.9	5.5 3.0 0.020 0.017 1.6 1.1 2.1 1.5	6.4 5.8 0.027 0.022 3.0 2.3 4.0 3.0	7.3 6.4 0.033 0.028 3.9 3.0 5.2 4.0	8.5 7.3 0.040 0.033 4.6 3.7 6.1 4.9	9.7 7.9 0.046 0.039 5.5 4.4 7.3 5.8
	A 22, 23	0.25 m <sup>3</sup> /s side 0.75	2.1 1.5 0.018 0.8	4.6 3.0 0.026 2.0	6.7 6.1 0.035 3.6	7.9 7.0 0.043 4.7	9.1 7.6 0.052 5.5	10.1 8.5 0.061 6.6
AD 0.033	52	throw m 0.50 0.25 m <sup>3</sup> /s side 0.75	1.1 2.6 0.023 0.120 1.1 0.5	2.6 5.5 0.035 0.017 2.6 1.1	4.8 8.0 0.047 0.024 3.5 1.8	6.2 9.5 0.058 0.029 4.6 2.8	7.3 11.0 0.069 0.035 5.5 3.5	8.8 12.1 0.082 0.041 6.2 3.9
m²	55 53 53	throw m 0.50 0.25 m <sup>3</sup> /s side 0.75	1.5 0.6 3.0 1.2 0.035 1.7	3.4 1.5 6.1 3.0 0.052 3.3	4.6 2.4 7.3 5.8 0.071 4.4	6.1 3.7 8.8 6.4 0.087 6.1	7.3 4.6 10.1 7.3 0.104 6.8	8.2 5.2 10.7 7.9 0.123 8.1
	Return NC+2	throw m 0.50 0.25 Total m <sup>3</sup> /s NC	2.2 4.0 0.047	4.4 7.7 <b>0.071</b>	5.9 9.5 <b>0.094</b>	8.1 11.7 0.118 23	9.1 12.4 0.142 28	10.8 13.5 0.165 33
150	Factors -SP=1.7 TP	m <sup>3</sup> /s side 0.75	A B 0.018 0.006 0.7 0.7	A B 0.027 0.009 1.6 0.9	A B 0.035 0.012 3.0 2.0	A B 0.044 0.015 3.5 3.0	A B 0.053 0.018 4.4 3.5	A B 0.062 0.021 5.0 4.4
300 X	42 43 A43	throw m 0.50 0.25 m <sup>3</sup> /s side 0.75	0.9 0.9 2.4 1.5 0.020 0.006 0.7 0.7	2.1 1.2 4.6 2.7 0.031 0.009 1.8 1.4	4.0 2.7 6.7 8.1 0.041 0.012 3.0 2.6	4.6 4.0 7.3 6.7 0.052 0.015 3.9 3.0	5.8 4.6 8.5 7.3 0.062 0.018 5.0 3.9	6.7 5.8 10.1 8.5 0.072 0.021 5.7 4.6
	31	throw m 0.50 0.25 m <sup>3</sup> /s side 0.75	0.9 0.9 2.1 1.5 0.023 0.012 0.9 0.9	2.4 1.8 5.8 3.7 0.035 0.018 2.3 1.6	4.0 3.4 7.0 6.1 0.047 0.024 3.2 2.6	5.2 4.0 7.9 7.0 0.060 0.029 4.4 3.2	6.7 5.2 9.7 7.9 0.071 0.035 5.0 4.1	7.6 6.1 10.1 9.1 0.083 0.041 5.9 5.0
	32 A	throw m 0.50 0.25 m <sup>3</sup> /s side 0.75	1.2 1.2 2.7 2.1 0.024 1.1	3.0 2.1 6.1 5.5 0.035 2.2	4.3 3.4 7.0 6.1 0.047 3.8	5.8 4.3 8.5 8.5 0.059 5.2	6.7 5.5 9.7 8.2 0.071 6.0	7.9 6.7 10.4 9.7 0.083 7.1
AD 0.045	22, 23	throw m 0.50 0.25 m <sup>3</sup> /s side 0.75	1.5 3.3 0.036 0.011 1.4 0.7	2.9 5.9 0.054 0.017 2.8 1.4	5.1 8.4 0.071 0.023 3.9 2.6	6.9 10.2 0.090 0.028 5.0 3.0	8.0 11.7 0.108 0.034 5.9 3.9	9.5 12.4 0.125 0.040 6.6 4.6
m²	52 55 55 53	throw m 0.50 0.25 m <sup>3</sup> /s side 0.75	1.8 0.9 3.4 1.5 0.047 2.0	3.7 1.8 6.4 3.7 0.071 3.6	5.2 3.4 7.9 6.1 0.094 5.3	6.7 4.0 9.7 7.0 0.118 6.3	7.9 5.2 10.4 7.9 0.142 7.7	8.8 6.1 12.2 9.1 0.165 8.5
	Return NC+2	throw m 0.50 0.25 Total m <sup>3</sup> /s NC	2.6 6.2 0.059	4.8 8.4 <b>0.087</b>	7.0 10.2 <b>0.118</b>	8.4 12.1 0.146 23	10.2 13.2 0.175 28	11.3 15.0 0.205 33
150	Factors -SP=2.0 TP	m³/s side 0.75	A B 0.029 1.4	A B 0.044 3.0	A B 0.059 4.1	A B 0.073 5.5	A B 0.087 6.6	A B 0.103 7.7
x 375	22, 23	throw m 0.50 0.25 m³/s side 0.75	1.8 3.7 0.047 0.012 1.6 0.9	4.0 7.3 0.070 0.017 3.2 1.6	5.5 8.8 0.094 0.024 4.4 2.8	7.3 11.0 0.117 0.029 5.5 3.2	8.8 12.1 0.140 0.035 6.2 4.1	10.2 13.2 0.165 0.040 7.1 5.0
AD	52 55 54 53	throw m 0.50 0.25 m <sup>3</sup> /s side	2.1 1.2 5.5 2.1 0.059	4.3 2.1 7.0 3.7 0.087	5.8 3.7 8.5 6.4 0.118	7.3 4.3 10.1 7.0 0.146	8.2 5.5 10.7 8.2 0.175	9.4 6.7 12.5 9.7 0.205
0.056 m²	Return NC+3	0.75 throw m 0.50 0.25 Total m³/s	2.2 2.9 7.0 <b>0.071</b>	3.8 5.1 8.4 <b>0.106</b>	5.5 7.3 11.0 <b>0.142</b>	6.8 9.1 12.1 <b>0.177</b>	8.3 11.0 14.6 0.212	9.1 12.1 15.7 0.248
150	Factors -SP=2.8 TP	MC m³/s side	A B 0.035	- A B 0.053	- A B 0.071	23 A B 0.088	A B 0.106	33 A B 0.124
450 AD	<sup>A</sup> 22, 23	throw m 0.50 0.25 m <sup>3</sup> /s side	1.7 2.2 4.0 0.071	3.3 4.4 7.7 0.106	4.4 5.9 9.5 0.142	6.0 8.0 11.7 0.177	6.8 9.1 12.4 0.212	8.0 10.6 13.6 0.248
0.068 m²	12, 13	0.75 throw m 0.50 0.25 Total m <sup>3</sup> /s	2.5 3.3 7.3 0.083	4.1 5.5 8.8 <b>0.123</b>	6.1 8.1 11.7 <b>0.165</b>	7.1 9.5 12.4 <b>0.205</b>	8.5 11.3 15.0 <b>0.245</b>	9.6 12.8 17.6 <b>0.288</b>
150 X 525	Return NC+4 Factors -SP=3.4TP	NC	- A B	- A B 0.123	- A B	23 A B 0.205	28 A B 0.245	33 A B 0.288
AD 0.079 m <sup>2</sup>	12, 13	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	2.5 3.3 7.3	4.4 5.9 9.1	6.3 8.4 12.1	7.4 9.9 12.8	9.1 12.1 15.7	9.6 12.8 17.9
	Return NC+5 Factors -SP=4.1 TP	Total m³/s NC	0.071 - A B	0.106 - A B	0.142 - A B	0.177 28 A B	0.212 33 A B	0.248 38 A B
225 x 300	42 <b>B</b> 43	m <sup>3</sup> /s side <sub>0.75</sub> throw m 0.50 0.25	0.023 0.013 0.9 0.7 1.2 0.9 2.7 2.1	0.033 0.020 2.3 1.6 3.0 2.1 6.1 5.5	0.044 0.027 3.0 2.8 4.0 3.7 7.0 6.4	0.056 0.033 4.4 3.2 5.8 4.3 8.5 7.0	0.066 0.040 5.3 4.1 7.0 5.5 9.7 8.2	0.078 0.046 5.9 5.3 7.9 7.0 10.4 10.1
	<b>31</b>	m <sup>3</sup> /s side <sub>0.75</sub> throw m <sub>0.50</sub> <sub>0.25</sub>	0.029 0.013 1.1 0.7 1.5 0.9 3.0 2.4	0.043 0.020 2.6 1.6 3.4 2.1 6.1 5.5	0.058 0.027 3.5 2.8 4.6 3.7 7.3 6.4	0.072 0.033 4.6 3.5 6.1 4.6 9.1 7.3	0.086 0.040 5.5 4.4 7.3 5.8 10.1 8.5	0.101 0.046 6.2 5.3 8.2 7.0 10.7 9.7
0.068 m <sup>2</sup>	32	m <sup>3</sup> /s side <sub>0.75</sub> throw m 0.50 0.25	0.023 0.023 1.4 0.9 1.8 1.2 3.4 2.4	0.035 0.035 2.8 1.8 3.7 2.4 6.4 5.8	0.047 0.047 3.7 3.0 4.9 4.0 7.9 6.7	0.059 0.059 5.0 3.9 6.7 5.2 9.7 7.9	0.071 0.071 5.7 4.6 7.6 6.1 10.4 9.1	0.083 0.083 6.6 5.3 8.8 7.0 11.3 9.1
	52 B 54 53	m <sup>3</sup> /s side <sub>0.75</sub> throw m <sub>0.50</sub> <sub>0.25</sub>	0.045 0.026 1.8 0.7 2.4 0.9 5.8 2.4	0.066 0.040 3.5 1.6 4.6 2.1 7.3 5.5	0.089 0.053 4.6 2.8 6.1 3.7 8.8 6.4	0.111 0.066 5.7 3.5 7.6 4.6 10.1 7.3	0.133 0.079 6.4 4.4 8.5 5.8 11.3 8.5	0.155 0.093 7.3 5.3 9.7 7.0 13.1 9.7

# Performance Data – CMPH

Size in mm	Patterns	Neck Vel m/s TP Pa	1.04 5	1.57 10	2.10 16	2.62 24	3.15 35	3.67 48
	Return NC+4	Static Pa Total m³/s NC	0.088	0.132 -	0.177 -	20 0.221 28	0.266 33	0.310 38
225 x	Factors -SP=1.8 TP  A A B B 43	m <sup>3</sup> /s side 0.75 throw m 0.50	A B 0.031 0.013 1.1 0.7 1.5 0.9	A B 0.046 0.020 2.6 1.8 3.4 2.4	A B 0.062 0.027 3.5 2.8 4.6 3.7	A B 0.078 0.033 4.6 3.5 6.1 4.6	A B 0.093 0.040 5.5 4.4 7.3 5.8	A B 0.109 0.046 6.2 5.5 8.2 7.3
375	31	0.25 m³/s side 0.75 throw m	3.0 2.4 0.037 0.013 1.4 0.7 1.8 0.9	6.1 5.8 0.056 0.020 2.8 1.8 3.7 2.4	7.3 6.4 0.075 0.027 3.7 3.0 4.9 4.0	9.1 7.3 0.094 0.033 5.0 3.9 6.7 5.2	10.1 8.5 0.113 0.040 5.7 4.6 7.6 6.1	11 10.1 0.132 0.046 6.6 5.5 8.8 7.3
	32	0.25 m³/s side 0.75 throw m 0.50	3.4 2.4 0.037 0.026 1.6 0.9 2.1 1.2	6.4 5.8 0.055 0.039 3.0 2.3 4.0 3.0	7.9 6.7 0.074 0.052 3.9 3.0 5.2 4.0	9.7 7.9 0.092 0.064 5.3 4.4 7.0 5.8	10.4 9.1 0.111 0.078 6.2 5.0 8.2 6.7	11.3 10.1 0.129 0.090 7.1 5.9 9.4 7.9
	A 22, 23	0.25 m³/s side 0.75 throw m	4.6 2.7 0.044 2.0 2.6	6.7 6.1 0.066 3.6 4.8	8.2 7.0 0.089 4.7 6.2	10.1 8.5 0.111 6.3 8.4	10.7 9.8 0.133 7.4 9.9	12.5 10.4 0.155 8.5 11.3
AD 0.084 m <sup>2</sup>	52 B 54 53	0.25 m³/s side 0.75 throw m 0.50	5.5 0.062 0.026 1.8 0.7 2.4 0.9	8.0 0.093 0.039 3.5 1.8 4.6 2.4	9.9 0.124 0.053 5.0 3.0 6.7 4.0	12.1 0.155 0.066 5.9 3.9 7.9 5.2	12.8 0.159 0.067 6.8 5.0 9.1 6.7	15.0 0.218 0.092 7.6 5.5 10.1 7.3
	12, 13	0.25 m <sup>3</sup> /s side 0.75 throw m 0.50	5.8 2.4 0.088 2.8 3.7	7.3 5.8 0.132 4.4 5.9	9.8 6.7 0.177 6.3 8.4	10.4 7.9 0.221 7.7 10.2	12.2 9.8 0.266 9.1 12.1	13.7 10.1 0.310 9.6 12.8
	Return NC+4 Factors -SP=2.2 TP	Total m <sup>3</sup> /s	7.3 0.105 -	9.1 0.159 -	12.1 0.213 -	13.2 0.265 28	15.7 0.319 33	17.9 0.372 38
225 X 450	42 4 B 43	m <sup>3</sup> /s side 0.75 throw m 0.50	A B 0.040 0.013 1.4 0.9 1.8 1.2	A B 0.060 0.020 2.8 2.0 3.7 2.7	A B 0.080 0.027 3.9 3.0 5.2 4.0	A B 0.100 0.033 5.0 3.9 6.7 5.2	A B 0.120 0.040 5.7 4.8 7.6 6.4	A B 0.140 0.046 6.6 5.7 8.8 7.6
450	A 31	0.25 m³/s side 0.75 throw m 0.50	3.7 2.7 0.046 0.013 1.6 0.9 2.1 1.2	6.4 6.1 0.070 0.020 3.0 2.3 4.0 3.0	7.9 6.7 0.093 0.027 3.9 3.2 5.2 4.3	9.8 7.9 0.116 0.033 5.3 4.4 7.0 5.8	10.1 9.4 0.140 0.040 6.2 5.0 8.2 6.7	11.9 10.1 0.163 0.046 7.1 5.9 9.4 7.9
	^ 22, 23	0.25 m³/s side 0.75 throw m 0.50	4.6 2.7 0.053 2.0 2.6	6.7 6.1 0.080 3.8 5.1	8.2 7.0 0.107 5.2 6.9	10.1 8.5 0.133 6.6 8.8	10.7 9.8 0.160 7.7 10.2	12.5 10.4 0.186 9.1 12.1
0.101 m <sup>2</sup>	52 B 54 53	0.25 m³/s side 0.75 throw m 0.50	0.079 0.026 2.3 0.9 3.0 1.2	8.4 0.120 0.039 3.7 2.3 4.9 3.0	10.2 0.160 0.053 5.3 3.2 7.0 4.3	12.1 0.200 0.065 6.6 4.4 8.8 5.8	13.5 0.240 0.079 7.4 5.0 9.8 6.7	15.7 0.280 0.092 8.0 5.9 10.7 7.9
	55 21, 13	0.25 m³/s side 0.75 throw m 0.50	6.1 2.7 0.105 3.3 4.4	7.6 6.1 0.159 5.2 6.9	10.1 7.0 0.213 6.6 8.8	11.3 8.5 0.265 8.3 11.0	12.8 9.8 0.319 9.6 12.8	14.9 10.4 0.372 9.9 13.2
	Return NC+5 Factors -SP=2.6 TP	0.25 Total m³/s NC	7.7 0.123 -	10.2 0.185	12.4 0.248 23	14.6 0.309 28	17.2 0.372 33	18.3 0.434 38
225 X 525	42 43 A43	m³/s side 0.75 throw m 0.50	A B 0.049 0.013 1.4 0.9 1.8 1.2	A B 0.073 0.020 3.0 2.0 4.0 2.7	A B 0.097 0.027 3.9 3.2 5.2 4.3 7.9 7.0	A B 0.122 0.033 5.0 4.1 6.7 5.5	A B 0.146 0.040 5.9 5.0 7.9 6.7	A B 0.171 0.046 6.8 5.9 9.1 7.9
525	31	0.25 m³/s side 0.75 throw m 0.50 0.25	4.3 2.7 0.055 0.013 1.6 0.9 2.1 1.2 5.2 2.7	6.7 6.1 0.083 0.020 3.2 2.3 4.3 3.0 7.0 6.1	7.9 7.0 0.111 0.027 4.4 3.5 5.8 4.6 8.5 7.3	10.1 8.2 0.138 0.033 5.5 4.4 7.3 5.8 10.1 8.5	10.4 9.8 0.166 0.040 6.4 5.3 8.5 7.0 11.0 10.1	12.2 10.4 0.194 0.046 7.4 6.2 9.8 8.2 12.8 10.7
0.118 m <sup>2</sup>	<sup>A</sup> 22, 23	m <sup>3</sup> /s side 0.75 throw m 0.50	0.062 2.2 2.9 6.9	0.093 3.8 5.1 8.4	0.124 5.5 7.3 11.0	0.155 6.8 9.1 12.1	0.186 8.3 11.0 14.6	0.217 9.3 12.4 17.2
	52 55 55 55 54 53	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.097 0.026 2.6 0.9 3.4 1.2 6.4 2.7	0.146 0.039 3.9 2.3 5.2 3.0 7.9 6.1	0.196 0.052 5.3 3.5 7.0 4.6 10.1 7.3	0.244 0.065 6.6 4.4 8.8 5.8 11.3 8.5	0.294 0.078 7.6 5.3 10.1 7.0 13.1 10.1	0.342 0.092 8.3 6.2 11.0 8.2 15.5 10.7
	Return NC+3 Factors -SP=1.7 TP	Total m³/s NC	0.117 - A B	0.177 - A B	0.236 23 A B	0.295 28 A B	0.354 33 A B	0.413 38 A B
300 X 375	43 A 43	m³/s side 0.75 throw m 0.50 0.25	0.036 0.023 1.4 0.9 1.8 1.2 4.3 2.7	0.053 0.035 3.0 2.0 4.0 2.7 6.7 6.1	0.071 0.047 3.9 3.2 5.2 4.3 7.9 7.0	0.089 0.059 5.0 4.1 6.7 5.5 9.7 8.2	0.106 0.071 5.9 5.0 7.9 6.7 10.4 9.8	0.123 0.083 6.8 5.7 9.1 7.6 12.2 10.1
	31	m³/s side 0.75 throw m 0.50 0.25	0.047 0.023 1.6 0.9 2.1 1.2 5.2 2.7	0.071 0.035 3.0 2.3 4.0 3.0 6.7 6.1	0.095 0.047 4.4 3.2 5.8 4.3 8.5 7.0	0.118 0.059 5.3 4.4 7.0 5.8 10.1 8.5	0.142 0.071 6.4 5.3 8.5 7.0 11.0 10.1	0.165 0.083 7.1 6.2 9.4 8.2 12.5 10.7
	<b>△ A B B</b>	m³/s side 0.75 throw m 0.50 0.25	0.037 0.040 1.1 1.8 1.5 2.4 3.0 5.8	0.055 0.061 2.8 3.2 3.7 4.3 6.4 7.0	0.074 0.081 3.5 4.6 4.6 6.1 7.3 9.1	0.092 0.101 4.8 5.7 6.4 7.6 9.4 10.1	0.111 0.122 5.5 6.8 7.3 9.1 10.1 12.2	0.129 0.142 6.4 7.8 8.5 10.4 11.0 14.3
	A 22,23	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.059 2.2 2.9 6.9	0.088 3.8 5.1 8.4	0.118 5.5 7.3 11.0	0.148 6.8 9.1 12.1	0.177 8.3 11.0 14.6	0.207 9.3 12.4 17.2
0.113 m <sup>2</sup>	52 55 54 55 53	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.070 0.047 2.6 0.9 3.4 1.2 6.4 2.7	0.106 0.071 3.9 2.3 5.2 3.0 7.9 6.1	0.142 0.094 5.3 3.5 7.0 4.6 10.1 7.3	0.177 0.118 6.6 4.4 8.8 5.8 11.3 8.5	0.212 0.142 7.6 5.3 10.1 7.0 13.1 10.1	0.248 0.165 8.3 6.2 11.0 8.2 15.5 10.7
	12, 13	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.117 3.3 4.4 7.7	0.177 5.2 6.9 10.2	0.236 6.6 8.8 12.4	0.295 8.3 11.0 14.6	0.354 9.9 13.2 17.6	0.413 10.1 13.5 18.7

## **CMPH** – Performance Data

Size	Patterns	Neck Vel m/s TP Pa	1.04	1.57 10	2.10 16	2.62 24	3.15 35	3.67 48
in mm	Return NC+4	Static Pa Total m³/s	5 3 0.140	0.212	13 0.283 23	20 0.354 28	30 0.425 33	40 0.496 38
200	Factors -SP=2.0 TP	NC m³/s side	A B 0.047 0.023	A B 0.071 0.035	A B 0.095 0.047	A B 0.118 0.059	A B 0.142 0.071 6.4 5.3	A B 0.165 0.083
300 X 450	B 42	0.75 throw m 0.50 0.25	1.6 1.1 2.1 1.5 5.2 2.7 0.059 0.023	3.2 2.3 4.3 3.0 6.7 6.1	5.8 4.6 8.5 7.3	7.3 5.8 10.1 8.5	8.5 7.0 11.0 10.1	9.8 7.9 12.8 10.4
	31	m <sup>3</sup> /s side 0.75 throw m 0.50	1.6 1.1 2.1 1.5	0.088 0.035 3.2 2.6 4.3 3.4	0.118 0.047 4.4 3.5 5.8 4.6	0.147 0.059 5.7 4.6 7.6 6.1	0.177 0.071 6.6 5.9 8.8 7.9	7.6 6.4 10.1 8.5
	A 22	0.25 m³/s side 0.75	5.5 3.0 0.053 0.044 2.0 1.4	7.0 6.1 0.079 0.066 3.5 2.8	8.5 7.3 0.106 0.089 5.0 3.7	10.1 8.8 0.133 0.111 5.9 5.0	11.3 10.4 0.159 0.133 7.1 5.7	13.1 11.0 1.860 0.155 8.0 6.6
	32	throw m 0.50 0.25 m³/s side	2.7 1.8 6.1 3.4 0.070	4.6 3.7 7.3 6.4 0.106	6.7 4.9 9.8 7.9 0.142	7.9 6.7 10.4 9.8 0.177	9.4 7.6 12.5 10.4 0.213	10.7 8.8 14.6 11.3 0.248
	<sup>A</sup> 22, 23	0.75 throw m 0.50 0.25	2.5 3.3 7.3	4.1 5.5 8.8	6.0 8.0 11.7	7.1 9.5 12.4	8.5 11.3 15.0	9.6 12.8 17.6
0.135 m <sup>2</sup>	52 54 53 54	m <sup>3</sup> /s side 0.75 throw m 0.50	0.093 0.047 2.8 1.1 3.7 1.5	0.141 0.071 4.1 2.6 5.5 7.1	0.189 0.094 5.7 3.5 7.6 4.6	0.236 0.118 7.1 4.6 9.4 6.1	0.283 0.142 7.8 5.7 10.4 7.6	0.331 0.165 8.5 6.4 11.3 8.5
		0.25 m <sup>3</sup> /s side 0.75 throw m 0.50	6.4 3.0 0.140 3.6	8.2 3.4 0.212 5.5	10.4 7.3 0.283 7.1	12.5 8.8 0.354 8.5	14.3 10.4 0.425 9.9	15.8 11.0 0.496 10.4
	Return NC+6	throw m 0.50 0.25 Total m <sup>3</sup> /s	4.8 8.0 <b>0.165</b>	7.3 10.6 <b>0.248</b>	9.5 12.8 <b>0.330</b>	11.3 15.0 <b>0.413</b>	13.2 17.9 0.496	13.9 19.4 <b>0.578</b>
	Factors -SP=2.3 TP	NC	- А В	- A B	23 A B	28 A B	33 A B	38 A B
300 X	42 43	m <sup>3</sup> /s side 0.75 throw m 0.50	0.060 0.023 1.8 1.1 2.4 1.5	0.089 0.035 3.2 2.6 4.3 3.4	0.118 0.047 4.4 3.5 5.8 4.6	0.148 0.059 5.7 4.6 7.6 6.1	0.177 0.071 6.6 5.5 8.8 7.3	0.206 0.083 7.6 6.2 10.1 8.2
525	, .	0.25 m³/s side 0.75	5.8 3.0 0.083 2.5	7.0 6.1 0.124 4.1	8.5 7.3 0.165 6.0	10.1 8.8 0.207 7.1	11.3 10.1 0.248 8.5	13.4 10.7 0.289 9.6
0.158 m <sup>2</sup>	22, 23	throw m 0.50 0.25 m³/s side	3.3 7.3 0.118 0.047	5.5 8.8 0.177 0.071	8.0 11.7 0.236 0.094	9.5 12.4 0.295 0.118	11.3 15.0 0.355 0.141	12.8 17.6 0.413 0.165
	52 54 55 53	0.75 throw m 0.50 0.25	2.8 1.4 3.7 1.8 6.4 3.4	4.4 2.8 5.8 3.7 8.5 6.4	5.9 3.7 7.9 4.9 10.4 7.6	7.4 4.8 9.8 6.4 12.8 9.4	8.0 5.9 10.7 7.9 14.9 10.4	8.7 6.6 11.6 8.8 16.2 11.3
300	Return NC+6	Total m³/s NC	0.187	0.283	0.378 23	0.472 28	0.566 33	0.661 38
600	Factors -SP=2.7 TP	m³/s side	A B 0.071 0.023	A B 0.106 0.035	A B 0.142 0.047	A B 0.177 0.059	A B 0.212 0.071	A B 0.248 0.083
AD 0.180 m <sup>2</sup>	42 43 A43	0.75 throw m 0.50 0.25	1.8 1.4 2.4 1.8 58 3.4	3.2 2.8 4.3 3.7 7.0 6.4	4.6 3.5 6.1 4.6 9.1 7.3	5.9 4.8 79 6.4 10.4 9.1	6.8 5.5 9.1 7.3 12.2 10.1	7.8 6.4 10.4 8.5 14.0 11.0
	Return NC+5 Factors -SP=2.1 TP	Total m³/s NC	0.177	0.264 -	0.354 23	0.441 28	0.532 33	0.618 38
375 X	▲ A	m³/s side 0.75	0.052 0.037 1.8 1.1	A B 0.077 0.055 3.0 2.8	A B 0.103 0.074 4.6 3.5	A B 0.129 0.092 5.7 4.6	A B 0.155 0.111 6.8 5.5	A B 0.180 0.129 7.6 6.2
450	42 43 A 43	throw m 0.50 0.25 m³/s side	2.4 1.5 5.8 3.0 0.069 0.037	4.0 3.7 6.7 6.4 0.105 0.055	6.1 4.6 9.1 7.3 0.140 0.074	7.6 6.1 10.1 8.8 0.175 0.092	9.1 7.3 12.2 10.1 0.210 0.111	10.1 8.2 13.4 10.7 0.245 0.129
AD 0.169	31	0.75 <b>throw m</b> 0.50 0.25	2.0 1.4 2.7 1.8 6.1 3.4	3.5 2.8 4.6 3.7 7.3 6.4	5.0 3.7 6.7 4.9 9.8 7.6	5.9 5.0 7.9 6.7 10.4 9.8	7.1 5.9 9.4 7.9 12.5 10.4	8.0 6.6 10.7 8.8 14.6 11.3
m <sup>2</sup>	32	m <sup>3</sup> /s side 0.75	0.053 0.061 1.6 2.3 2.1 3.0	0.079 0.093 3.0 3.7 4.0 4.9	0.106 0.124 3.9 5.0 5.2 6.7	0.133 0.155 5.3 6.2 7.0 8.2	0.159 0.186 6.2 7.4 8.2 9.8	0.186 0.217 7.1 8.0 9.4 10.7
	Return NC+6	0.25 Total m³/s	4.6 6.1 0.205	6.7 7.6 0.309	8.2 10.1 0.413 23	10.1 10.7 0.516 28	10.7 12.8 0.620 33	12.5 14.9 0.723 38
	Factors -SP=2.2 TP	NC	A B	A B	A B	A B	A B	A B
375 X 525	31	m <sup>3</sup> /s side 0.75 throw m 0.50	0.084 0.037 2.0 1.4 2.7 1.8	0.127 0.055 3.7 3.0 4.9 4.0	0.170 0.074 5.3 3.9 7.0 5.2	0.212 0.092 6.2 5.3 8.2 7.0	0.255 0.111 7.6 5.9 10.1 7.9	0.297 0.129 8.0 6.8 10.7 9.1
525	A 32	0.25 m³/s side 0.75	6.4 4.3 0.072 0.067 2.0 1.8	7.6 6.7 0.108 0.100 3.9 3.2	9.8 7.9 0.145 0.134 5.5 4.4	10.7 10.1 0.181 0.168 6.4 5.5	13.1 10.4 0.217 0.202 7.6 6.4	14.9 11.6 0.253 0.235 8.3 7.4
	32	throw m 0.50 0.25 m³/s side	2.7 2.4 6.4 5.5 0.103	5.2 4.3 8.2 8.2 0.155	7.3 5.8 10.1 8.5 0.207	8.5 7.3 11.0 10.1 0.258	10.1 8.5 13.7 11.6 0.310	11.0 9.8 15.2 12.8 0.362
	<sup>A</sup> 22, 23	0.75 <b>throw m</b> 0.50 0.25	2.8 3.7 7.7	4.7 6.2 9.9	6.6 8.8 12.1	7.7 10.2 13.2	9.1 12.1 16.5	9.9 13.2 18.3
AD 0.197 m <sup>2</sup>	52	m <sup>3</sup> /s side 0.75 throw m 0.50	0.132 0.073 3.0 1.4 4.0 1.8	0.199 0.110 4.8 3.0 6.4 4.0	0.266 0.147 6.2 3.9 8.2 5.2	0.332 0.184 7.6 5.3 10.1 7.0	0.399 0.221 8.3 5.9 11.0 7.9	0.465 0.258 8.7 6.8 11.6 9.1
		0.25 m³/s side	7.0 4.3 0.205 3.8	9.4 6.7 0.309 6.1	10.7 7.9 0.413 8.0	13.7 9.1 0.516 9.1	15.2 10.4 0.620 10.1	16.5 11.6 0.723 10.7
	12, 13	0.75 throw m 0.50 0.25	5.1 8.4	8.1 11.7	10.6 13.5	12.1 17.2	13.5 18.7	14.3 19.8
	Return NC+7 Factors -SP=2.7TP	Total m³/s NC	0.234	0.353	0.473 23	0.590 28	0.709 33	0.826 38
375	A B	m³/s side 0.75	0.080 0.037 2.3 1.4	A B 0.122 0.055 3.5 3.0	A B 0.163 0.074 5.0 3.9	A B 0.203 0.092 6.2 5.0	A B 0.244 0.111 7.1 5.9	A B 0.284 0.129 7.8 6.6
600 X	B 42	throw m 0.50 0.25 m³/s side	3.0 1.8 6.1 4.3 0.117	4.6 4.0 7.3 6.7 0.177	6.7 5.2 9.8 8.2 0.237	8.2 6.7 10.7 9.8 0.295	9.4 7.9 12.5 10.4 0.355	10.4 8.8 14.6 11.6 0.413
	<sup>A</sup> 22, 23	0.75 <b>throw m</b> 0.50 0.25	3.3 4.4 7.7	5.2 6.9 10.2	6.8 9.1 12.1	8.0 10.6 13.9	9.3 12.4 17.6	10.1 13.5 19.0
AD 0.225 m <sup>2</sup>	52	m <sup>3</sup> /s side 0.75 throw m 0.50	0.161 0.073 3.2 1.6 4.3 2.1	0.243 0.110 5.0 3.2 6.7 4.3	0.325 0.148 6.4 4.4 8.5 5.8	0.405 0.185 7.6 5.5 10.1 7.3	0.487 0.222 8.5 6.2 11.3 8.2	0.567 0.259 8.9 7.1 11.9 9.4
	<u></u>	m <sup>3</sup> /s side 0.75	7.0 5.2 0.234 3.8	9.8 6.7 0.353 6.1	11.3 8.2 0.473 8.3	13.7 10.1 0.590 9.3	15.5 10.7 0.709 10.1	16.8 12.5 0.826 10.7
	12, 13	throw m 0.50 0.25	5.8 5.1 8.8	8.1 11.7	8.3 11.0 14.6	9.3 12.4 17.6	10.1 13.5 19.4	10.7 14.3 20.1

# Performance Data – CMPH

Size in mm	Patterns	Neck Vel m/s TP Pa Static Pa	1.04 5	1.57 10	2.10 16	2.62 24	3.15 35	3.67 48
	Return NC+6	Total m³/s	3 0.246	0.371	13 0.496	20 0.619	30 0.744	0.867
	Factors -SP=2.3 TP	NC	- A B	A B	23 A B	28 A B	33 A B	38 A B
450 x 525	31	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.097 0.05 2.6 1.6 3.4 2.1 6.4 5.2 0.123	3 0.146 0.079 3.9 3.2 5.2 4.3 7.9 6.7 0.186	0.195 0.106 5.3 4.4 7.0 5.8 10.1 8.5 0.248	0.243 0.133 6.6 5.5 8.8 7.3 11.3 10.1 0.310	0.292 0.159 7.6 6.2 10.1 8.2 13.7 10.7 0.372	0.341 0.186 8.3 7.4 11.0 9.8 15.2 12.8 0.434
AD	<sup>A</sup> 22, 23	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25 m <sup>3</sup> /s side	3.3 4.4 7.7 0.193 0.05	5.2 6.9 10.2	6.8 9.1 12.1 0.390 0.106	8.0 10.6 14.6 0.487 0.132	9.3 12.4 17.9 0.585 0.159	10.1 13.5 19.4 0.681 0.186
0.236 m²	52 B 54 53	0.75 throw m 0.50 0.25 m³/s side	3.2 1.6 4.3 2.1 7.0 5.2 0.246	5.0 3.2 6.7 4.3 9.8 6.7 0.371	6.6 4.4 8.8 5.8 11.6 8.5 0.496	7.6 5.5 10.1 7.3 14.0 10.1 0.619	8.5 6.2 11.3 8.2 15.5 10.7 0.744	8.9 7.4 11.9 9.8 16.8 12.8 0.867
	12, 13	0.75 throw m 0.50 0.25	4.1 5.5 8.8	6.3 8.4 12.1	8.5 11.3 15.0	9.9 13.2 17.6	10.4 13.9 19.8	10.7 14.3 20.5
	Return NC+7 Factors -SP=2.6 TP	Total m³/s NC	0.281 - A B	0.424	0.567 23 A B	0.707 28 A B	0.851 33 A B	0.991 38 A B
450 X 600	42	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.088 0.05 2.6 1.6 3.4 2.1 6.4 5.2	3.9 3.0 5.2 4.0 7.9 7.0	0.178 0.106 5.5 4.1 7.3 5.5 10.1 8.5	0.221 0.133 6.4 5.3 8.5 7.0 11.3 10.1	0.267 0.159 7.6 6.4 10.1 8.5 13.7 11.0	0.310 0.186 8.3 7.1 11.0 9.4 15.5 12.5
	31	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25 m <sup>3</sup> /s side	0.114 0.05 2.8 1.8 3.7 2.4 6.4 5.8 0.094 0.09	4.4 3.2 5.8 4.3 8.5 7.0	0.230 0.106 5.7 4.6 7.6 6.1 10.1 8.8 0.189 0.189	0.287 0.133 6.8 5.7 9.1 7.6 12.2 10.1 0.236 0.236	0.346 0.159 8.0 6.6 10.7 8.8 14.6 11.3 0.284 0.284	0.403 0.186 8.5 7.6 11.3 10.1 15.5 13.1 0.330 0.330
	32	0.75 throw m 0.50 0.25 m <sup>3</sup> /s side	3.0 2.0 4.0 2.7 6.7 6.1	4.6 3.5 6.1 4.6 8.8 7.3 0.212	5.9 5.0 7.9 6.7 10.4 9.8	7.1 5.9 9.4 7.9 12.5 10.4 0.354	8.0 7.1 10.7 9.4 14.9 12.5 0.426	8.7 8.0 11.6 10.7 16.2 14.6 0.496
AD	A 22, 23	0.75 throw m 0.50 0.25 m <sup>3</sup> /s side	3.6 4.8 8.0 0.228 0.05	5.5 7.3 10.6	7.1 9.5 12.4 0.461 0.106	8.5 11.3 15.0 0.574 0.133	9.6 12.8 18.3 0.691 0.160	10.4 13.9 19.8 0.805 0.186
0.270 m²	52 55 55 55 54 53	0.75 throw m 0.50 0.25 m³/s side	3.5 1.8 4.6 2.4 7.3 5.8 0.281	5.3 3.2 7.0 4.3 10.1 7.0 0.424	6.8 4.6 9.1 6.1 12.2 8.8 0.567	7.8 5.7 10.4 7.6 14.3 10.1 0.707	8.7 6.6 11.6 8.8 15.8 11.3 0.851	9.2 7.6 12.2 10.1 17.1 13.1 0.991
	12, 13	0.75 throw m 0.50 0.25	4.1 5.5 8.8	6.8 9.1 12.4	8.5 11.3 15.4	10.1 13.5 17.9	10.4 13.9 20.1	11.0 14.6 20.9
	Return NC+9 Factors -SP=3.2 TP	Total m³/s NC	0.369 - A B	0.556 - A B	0.744 23 A B	0.928 28 A B	1.116 33 A B	1.301 38 A B
525 X 675	31	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.148 0.07 3.0 2.0 4.0 2.7 6.7 6.1	2 0.224 0.108 4.6 3.5 6.1 4.6 9.1 7.3	0.300 0.145 5.9 5.0 7.9 6.7 10.4 9.8	0.374 0.181 7.1 5.9 9.4 7.9 12.5 10.4	0.450 0.217 8.5 7.1 11.3 9.4 15.5 12.5	0.524 0.253 8.7 7.8 11.6 10.4 16.2 13.7
	A 32	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.125 0.11 3.2 2.3 4.3 3.0 7.0 6.1	5.0 3.9 6.7 5.2 9.8 7.9	0.252 0.239 6.4 5.0 8.5 6.7 11.0 10.1	0.315 0.298 7.6 6.4 10.1 8.5 13.4 11.6 0.464	0.379 0.359 8.3 7.6 11.0 10.1 15.2 13.1	0.441 0.418 18.9 8.0 11.9 10.7 16.5 14.9
	<sup>A</sup> 22, 23	m <sup>3</sup> / <b>s side</b> 0.75 <b>throw m</b> 0.50 0.25	0.185 3.8 5.1 8.4	0.278 6.0 8.0 11.7	0.372 7.7 10.2 13.2	9.1 12.1 16.1	0.558 9.9 13.2 18.7	0.651 10.7 14.3 20.1
0.354 m <sup>2</sup>	52 55 54 55 53	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.297 0.07 3.7 2.0 4.9 2.7 7.6 6.1	5.5 3.5 7.3 4.6 10.4 7.3	0.599 0.145 7.1 5.0 9.4 6.7 12.5 9.8	0.748 0.180 8.0 5.9 10.7 7.9 14.9 10.4	0.899 0.217 8.7 7.1 11.6 9.4 16.2 12.5	1.048 0.253 9.4 7.8 12.5 10.4 17.4 13.7
	12, 13	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.369 4.7 6.2 9.5	0.556 7.1 9.5 12.8	0.744 8.8 11.7 15.7	0.928 10.4 13.9 19.0	1.116 10.7 14.3 20.5	1.301 11.6 15.4 21.6
525 X 825	Return NC+9 Factors -SP=3.3 TP	Total m³/s NC	0.450 - A B		0.910 23 A B	1.135 28 A B	1.364 33 A B	1.590 38 A B
0.433 m <sup>2</sup>	43 43	m <sup>3</sup> / <b>s side</b> 0.75 <b>throw m</b> 0.50 0.25	0.153 0.07 3.0 2.3 4.0 3.0 6.7 6.1	2 0.232 0.108 4.6 3.5 6.1 4.6 8.8 7.3	0.310 0.145 5.9 5.0 7.9 6.7 10.4 9.7	0.387 0.181 7.1 5.9 9.4 7.9 12.5 10.4	0.465 0.217 8.0 7.1 10.7 9.4 15.2 12.5	0.542 0.253 8.7 7.6 11.6 10.1 16.2 13.7
600	Return NC+9 Factors -SP=3.5TP	Total m³/s NC	0.468 - A B	0.707 - A B	0.945 23 A B	1.179 28 A B	1.418 33 A B	1.652 38 A B
750	42 43 A43	m³/s side 0.75 throw m 0.50 0.25	0.140 0.09 3.0 2.3 4.0 3.0 6.7 6.1	4 0.212 0.141 4.8 3.5 6.4 4.6 9.1 7.3	0.284 0.189 6.2 5.0 8.2 6.7 10.7 9.8	0.354 0.236 7.4 6.2 9.8 8.2 12.8 10.7	0.425 0.284 8.0 7.1 10.7 9.4 15.2 12.5	0.496 0.330 8.9 8.3 11.9 11.0 16.5 14.6
0.450 m <sup>2</sup>	<b>▲</b> 32	m <sup>3</sup> /s side 0.75 throw m 0.50 0.25	0.161 0.14 3.2 2.6 4.3 3.4 7.3 6.4		0.325 0.295 6.8 5.7 9.1 7.6 12.2 10.4	0.405 0.368 7.8 6.6 10.4 8.8 14.6 11.9	0.487 0.443 8.5 7.8 11.3 10.4 16.2 14.6	0.568