

2.3 CHROMAGEN Collector Specifications

Mode	CR-90		CR-100		CR-110		CR-120			CR-130		CR-140	
							Regular	Sputtering					
Riser Diameter	8 mm	5/8"	8 mm	5/8"	8 mm	5/8"	8 mm	5/8"	8 mm	8mm	5/8"	8mm	5/8"
Gross Area [m ²]	1.69	1.69	2.05	2.05	2.37	2.37	2.80	2.80	2.80	2.96	2.96	3.71	3.71
Net Aperture Area [m ²]	1.52	1.52	1.85	1.85	2.15	2.15	2.56	2.56	2.56	2.73	2.73	3.44	3.44
Length [cm]	182	182	190	190	219	219	219	219	219	247	247	309	309
Width [cm]	93	93	108	108	108	108	128	128	128	120	120	120	120
Thickness [cm]	9	9	9	9	9	9	9	9	9	9	9	9	9
Weight (Empty) [kg]	27	29	31	34	35	38	41	44	44	45	49	54	60
Fluid Capacity [liter]	1.0	2.7	1.2	3.2	1.3	3.6	1.5	4.1	1.6	2.3	5.3	2.6	6.3

- Collector test pressure: 12 bar.
- Max collector operation pressure: 10 bar.
- Dimensions in cm; Aluminium frame

Coating Specifications

Type	Absorptance α	Emissivity ϵ	Stagnation Temp @1000W/m ² & ambient Temp 30°C
Selective Paint	0.9	0.45	160°C
Black Chrome	0.95	0.12	170°C
Sputtering	0.95	0.05	180°C

Due to on-going development, specifications are subject to change without notice

Glass Specifications

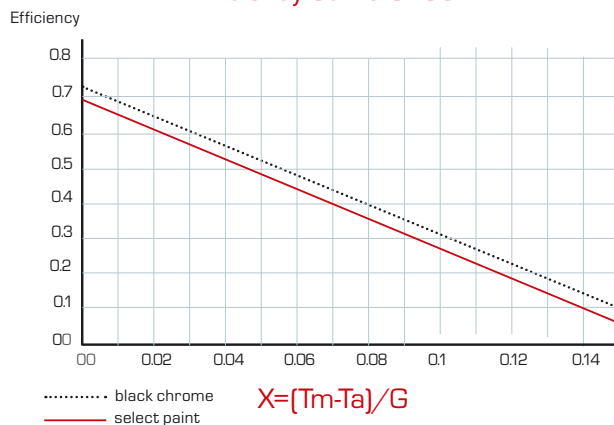
Type	Emissivity ϵ	Transmittance (Visible Light) $\tau_{0.65}$	Transmittance (Solar Radiation) τ_{sol}	Thickness t [mm]	Conduction K[W/mk]
Regular	0.85	0.90	0.86	2.8-3.5	1
Solar Tempered	0.85	0.916	0.91	3-4	1

2.4 Collector Data Sheets

CR90

Riser Diameter	8 mm	5/8"
Connection Thread BSP (female)	3/4"	3/4"
Gross Area [m ²]	1.69	1.69
Net Aperture Area [m ²]	1.52	1.52
Length [cm]	182	182
Width [cm]	93	93
Thickness [cm]	9	9
Weight (Empty) [kg]	27	29
Fluid Capacity [liter]	1	2.7
Test Pressure [bar]	12	12
Max. Operating Pressure [bar]	10	10
Efficiency Curve (black chrome)	n=0.72 - 4.10X	
Efficiency Curve (selective paint)	n=0.685 - 4.21X	

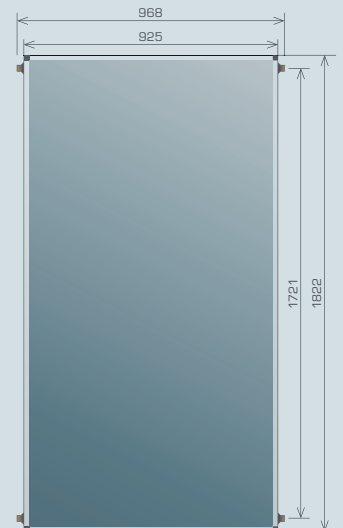
Efficiency Curve CR90



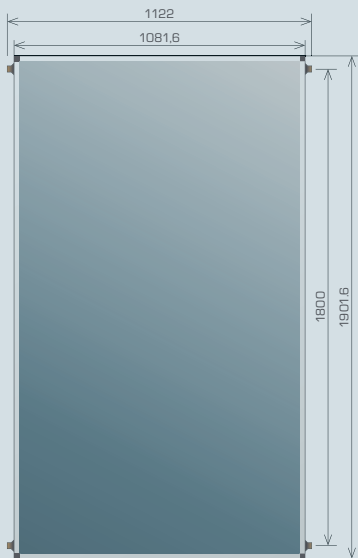
$T_m = (T_{out} + T_{in}) / 2$: Mean Water Temp
 T_a : Ambient Temp
 G : Instantaneous Solar Radiation

Flow [L / hr]	Pressure Drop On One 5/8" col. [Cm of Water]	Pressure Drop On One 8mm col. [Cm of Water]
50	0.1	0.3
100	0.3	1
150	0.9	2.1
200	1.4	3.5
250	2.5	6
300	3.7	8
350	5.3	10.2

- Dimensions in cm – Aluminium frame
- Efficiency curves were obtained by the Standards Institution of Israel and Chromagen Laboratories.

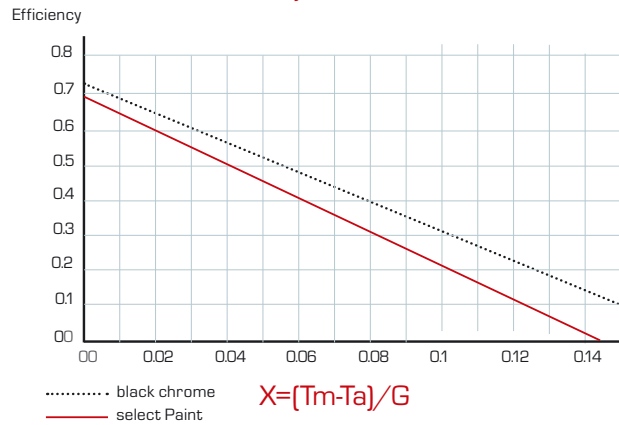


CR100



Riser Diameter	8 mm	5/8"
Connection Thread BSP	3/4"	3/4"
Gross Area [m ²]	2.05	2.05
Net Aperture area [m ²]	1.85	1.85
Length [cm]	190	190
Width [cm]	108	108
Thickness [cm]	9	9
Weight (Empty) [kg]	31	34
Fluid Capacity [liter]	1.2	3.2
Test Pressure [bar]	12	12
Max. Operating Pressure [bar]	10	10
Efficiency Curve (black chrome)	$\eta=0.73 - 4.15X$	
Efficiency Curve (Selective Paint)	$\eta=0.69 - 4.75X$	

Efficiency Curve CR100



$T_m=(T_{out}+T_{in})/2$: Mean Water Temp
 T_a : Ambient Temp
 G : Instantaneous Solar Radiation

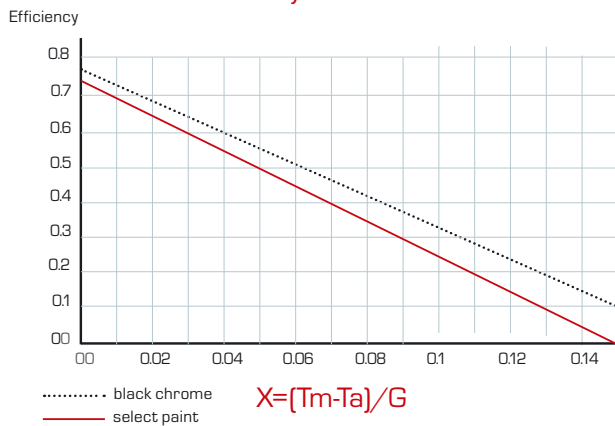
Flow	Pressure Drop On One 5/8" col.	Pressure Drop On One 8mm col.
[L/ hr]	[Cm of Water]	[Cm of Water]
50	0.2	0.6
100	0.4	0.9
150	1.0	2.5
200	1.5	4
250	2.7	6.3
300	4.0	8.5
350	5.6	10.9

- Dimensions in cm – Aluminium Frame
- Efficiency curves were obtained by the Standards Institution of Israel and Chromagen Laboratories.

CR110

Riser Diameter	8 mm	5/8"
Connection Thread BSP	3/4"	3/4"
Gross Area [m ²]	2.37	2.37
Net Aperture Area [m ²]	2.15	2.15
Length [cm]	219	219
Width [cm]	108	108
Thickness [cm]	9	9
Weight (Empty) [kg]	35	38
Fluid Capacity [liter]	1.3	3.6
Test Pressure [bar]	12	12
Max. Operating Pressure [bar]	10	10
Efficiency Curve (black chrome)	$\eta=0.76 - 4.34X$	
Efficiency Curve (selective paint)	$\eta=0.73 - 4.9X$	

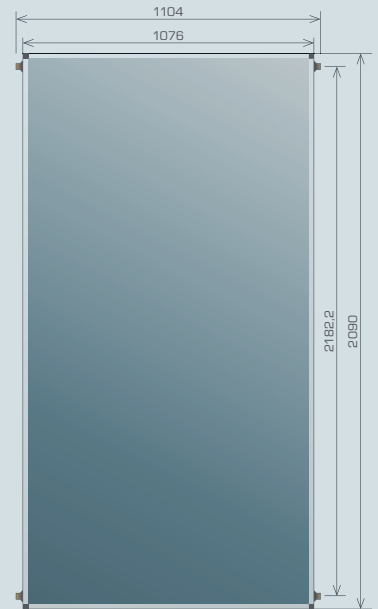
Efficiency Curve CR110



$T_m = (T_{out} + T_{in}) / 2$: Mean Water Temp
 T_a : Ambient Temp
 G : Instantaneous Solar Radiation

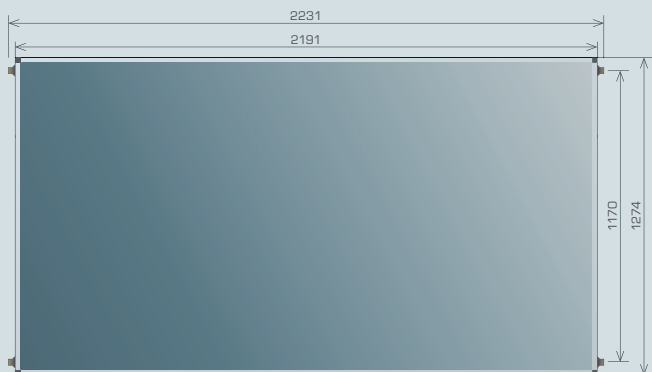
Flow [L / hr]	Pressure Drop On One 5/8" col. [Cm of Water]	Pressure Drop On One 8mm col. [Cm of Water]
50	0.25	0.75
100	0.50	1.6
150	1.25	2.6
200	2.00	5
250	3.00	7
300	4.25	8.5
350	5.75	12

- Dimensions in cm - Aluminium Frame
- Efficiency curves were obtained by the Standards Institution of Israel and Chromagen Laboratories.



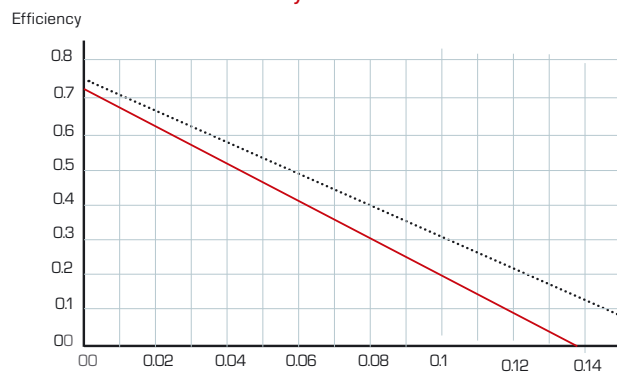
CR120

Horizontal



Riser Diameter	5/8"
Connection Thread BSP	3/4"
Gross Area [m ²]	2.80
Net Aperture Area [m ²]	2.56
Length [cm]	219
Width [cm]	128
Thickness [cm]	9
Weight (Empty) [kg]	45
Fluid Capacity [liter]	5.1
Test Pressure [bar]	12
Max. Operating Pressure [bar]	10
Efficiency Curve (black chrome)	h=0.75 - 4.1X
Efficiency Curve (selective paint)	h=0.72 - 4.8X

Efficiency Curve CR120



..... black chrome $X = (T_m - T_a) / G$
 ——— select paint

$T_m = (T_{out} + T_{in}) / 2$: Mean Water Temp
 T_a : Ambient Temp
 G : Instantaneous Solar Radiation

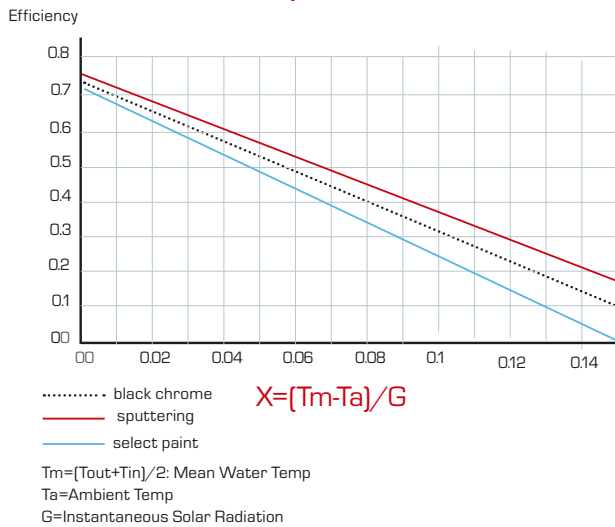
Flow	Pressure Drop On One 5/8" col.	Pressure Drop On One 8mm col.
[L / hr]	[Cm of Water]	[Cm of Water]
50	0.1	0.3
100	0.2	0.8
150	0.6	1.3
200	1	2.5
250	1.5	3.5
300	2.1	4.2
350	2.9	6.0

- Dimensions in cm- Tin Frame
- Efficiency curves were obtained by the Standards Institution of Israel and Chromagen Laboratories.

CR120

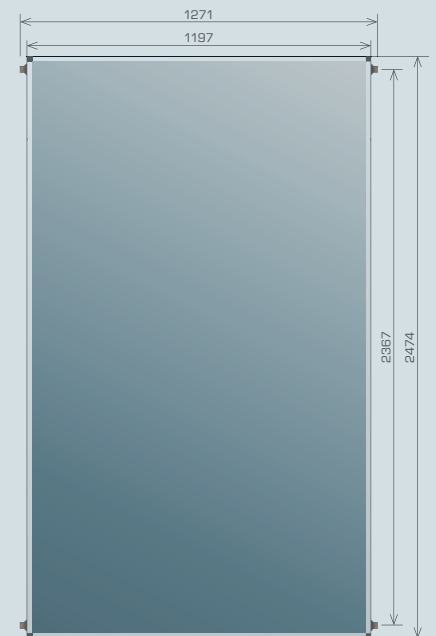
Model	CR-120		CR-120 Sputtering
Risers Diameter	8 mm	5/8"	8 mm
Connections thread BSP	3/4"	3/4"	3/4"
Gross Area [m ²]	2.80	2.80	2.80
Net Aperture Area [m ²]	2.56	2.56	2.56
Length [cm]	219	219	219
Width [cm]	128	128	128
Thickness [cm]	9	9	9
Weight (Empty) [kg]	41	44	44
Fluid Capacity [liter]	1.5	4.1	1.6
Test Pressure [bar]	12	12	12
Max. Operating Pressure [bar]	10	10	10
Efficiency Curve (black chrome)	$\eta=0.72 - 4.14X$		$\eta=0.74 - 3.9X$
Efficiency Curve (Selective paint)	$\eta=0.72 - 4.8X$		

Efficiency Curve CR120

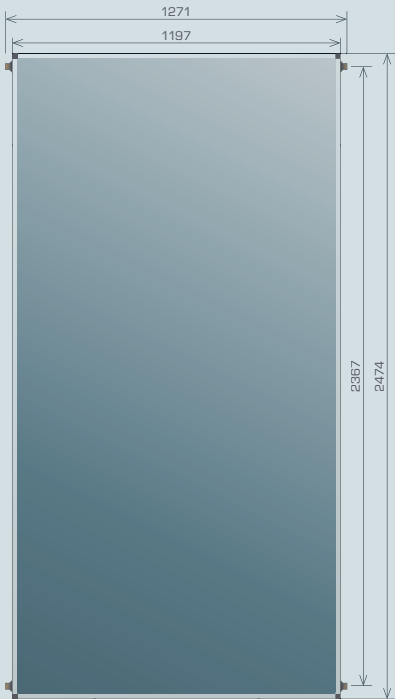


Flow	Pressure Drop On One 5/8" col.	Pressure Drop On One 8mm col.
[L / hr]	[Cm of Water]	[Cm of Water]
50	0.4	1.5
100	1	3
150	1.8	4.3
200	3	7.2
250	4.8	9.8
300	6	12.6
350	9	18

- Dimensions in cm – Aluminium Frame
- Efficiency curves were obtained by the Standards Institution of Israel and Chromagen Laboratories.

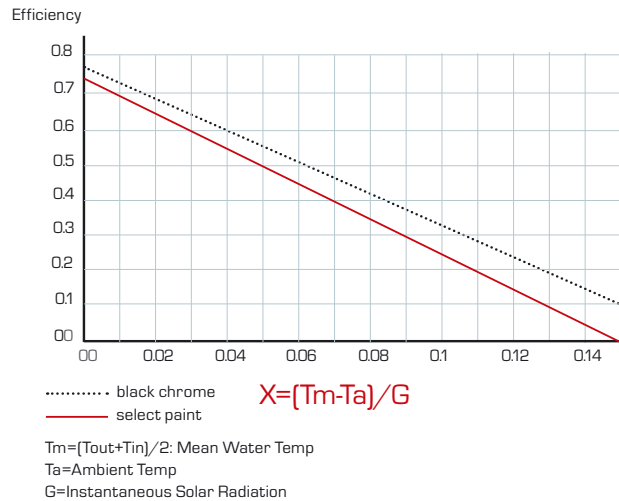


CR130



Risers Diameter	8 mm	5/8"
Connections thread BSP	3/4"	3/4"
Gross Area [m ²]	2.96	2.96
Net Aperture Area [m ²]	2.73	2.73
Length [cm]	247	247
Width [cm]	120	120
Thickness [cm]	9	9
Weight (Empty) [kg]	52	54
Fluid Capacity [liter]	2.3	5.3
Test Pressure [bar]	12	12
Max. Operating Pressure [bar]	10	10
Efficiency Curve (black chrome)	$\eta=0.74 - 4.2X$	
Efficiency Curve (Selective paint)	$\eta=0.73 - 4.9X$	

Efficiency Curve CR130



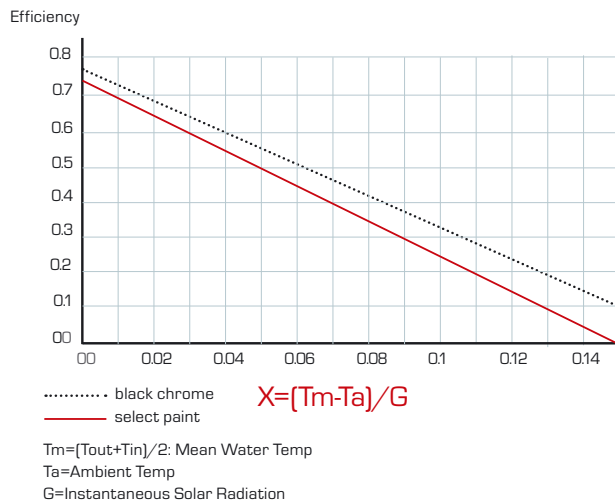
Flow [L / hr]	Pressure Drop On One 5/8" col. [Cm of Water]	Pressure Drop On One 8mm col. [Cm of Water]
50	0.3	1
100	0.9	2.8
150	1.6	4
200	2.8	7
250	4.5	9.5
300	5.8	12.3
350	7.6	16.7

- Dimensions in cm – Aluminium Frame
- Efficiency curves were obtained by the Standards Institution of Israel and Chromagen Laboratories.

CR140

Risers Diameter	8 mm	5/8"
Connections thread BSP	3/4"	3/4"
Gross Area [m ²]	3.71	3.71
Net Aperture Area [m ²]	3.44	3.44
Length [cm]	309	309
Width [cm]	120	120
Thickness [cm]	9	9
Weight (Empty) [kg]	54	60
Fluid Capacity [liter]	2.6	6.3
Test Pressure [bar]	12	12
Max. Operating Pressure [bar]	10	10
Efficiency Curve (black chrome)	$\eta=0.75 - 4.3X$	
Efficiency Curve (Selective paint)	$\eta=0.73 - 5.0X$	

Efficiency Curve CR140



Flow [L / hr]	Pressure Drop On One 5/8" col. [Cm of Water]	Pressure Drop On One 8mm col. [Cm of Water]
50	0.6	1.8
100	1.4	3.8
150	2.5	6.3
200	4	8.1
250	6	12.3
300	9	17.7
350	14	25

- Dimensions in cm - Aluminium Frame
- Efficiency curves were obtained by the Standards Institution of Israel and Chromagen Laboratories.

