The importance of being CTI-Eurovent



Summary

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Introduction

The three sections of this paper will touch the following topics:

- 1) A brief explaination of the aim of the third-part certification;
- 2) A comparison between the datasheet of a third-part certified unit and the datasheet of a non certified unit.
- 3) An evaluation of the impact of the third-part certification on the Key Parameters Indicator performances for cooling technologies.

Aim of Third-part certification

The aim of third-part certification is safety.

If you are providing a high quality product you aren't interested in saving money on the material quality or the performances of the heat transfer media, guaranteed performance is going to allow you to achieve the performance requested even if the design process wasn't perfect. Being certified prevents issues even if environmental conditions become more critical than expected and even if

operating and maintenance conditions are not optimal. Also the use of a certified product guarantees you to get the specified unit performance using the lowest possible energy.

Third part certification vs manufacturer guaranteed performance

In the following section there will be a comparison between performances of a third-party certified unit and a unit with a manufacturer's guarantee.

CERT	IFIED			NOT	CERTII	FIED	
(1) ATWE	02939904		Selection Criteria	Total Each Un	it Required Capacity	,	
Product Description	3 8-5K21 a ecarpineli	@evapco.it	Flow	47,8 lps 47,8 lps	1000 kW		
The ATWB is a prime-surface steel coil only closed circuit cooler, featuring		charge Air	Fluid	Water Water	860.010 kcal/hr		
Enhancement, designed around EVAPCO's induced draft Advanced Technol line offers the most box size configurations in the industry while also provide			Entering Fluid Temp	35,0 °C 35,0 °C	227,52 Tons		
capacity at reduced loads. This is not true for most evaporative closed circo. The ATWB is a maintenance friendly product, designed for all routine maint	uit coolers in the industry!	0	Leaving Fluid Temp	30,0 °C 30,0 °C			
from outside the unit.	tenance to be performed		Entering Wet Bulb	25,0 °C 25,0 °C			
Selection Criteria Total Each Unit Require	d Capacity						
Flow: 47,8 LPS 47,8 LPS 1.000,00 Fluid: Water Water 860,010 F		Cooled Fluid Out	Unit Selected				
Entering Fluid Temp: 35,0 C 35,0 C 227,52 To Leaving Fluid Temp: 30,0 C 30,0 C			XXXX at 103,6% cap	acity [1036,40 kW]			
Entering Wet Bulb: 25,0 C 25,0 C Entering Switchov	Dry Bulb						
Unit Selected	er:		Physical Data per Unit				
One(1) EVAPCO ATWB 8-5K21 at 103,4% capacity (1.033)	.76 kW)		Overall Dimensions [W x L x H]	2.388 mm x 6.4	01 mm x 3.632 mm		
Product line is CTI certified for water, propylene glycol or ethylene glycol		CTÍ	Operating Weight	12.143 kg			
accordance with CTI Standard 201 RS. Product line is Eurovent (ECC) certified. Selection is rated in accordance w	ith TCR ECP-04	CREETFICE	Shipping Weight	7.738 kg			
Physical Data Per Unit	IBC Design Capability		Heaviest Section	6.380 kg			
Overall Dimensions (WxLxH): 2.388mm x 6.401mm x 4.032mm	IBC Standard Structural Design						
Operating Weight: 14.869 kg Shipping Weight: 9.974 kg	1.0 Importance Factor Specified Seismic(Sos): up to 1.6 g, z/h = 0)	Fan Motor Data Per Unit			Pump Motor Data per Unit	
Heaviest Section: 8.620 kg *weights and dimensions could vary depending on options selected	Wind Load(P): up to 13.79 kPa		Number of Fans	2		N° of Pumps	1
Fan Motor Data Per Unit	Pump Motor Data per Unit					Nameplate	
Number of Fans: 2 # of Fan Motors: 2 Nameolate Power (400/3/50): 15.00 kW Per Motor	No.of Pumps: 1 Nameplate Power (400/3/50): 5,5 kW per pump m	ootor	# of Fan motors	2		Power [400/3/50]	5,5 kW
Total Connected Nameplate 30.00 kW	Design Amps: 11,4 Amps Per Mot *Design amps could vary		Nameplate Power (400/3/50)	11,00 kW per mot	or	Design Amps	11,4 Amps per Motor
Power: 50,00 km Typical Nameplate FLA: 27,9 Amps Per Motor			Total connected				
*Nameplate FLA could vary			Nameplate Power	22,00 kW			
e solutio	Additional Details Per Unit		Typical Nameplate FLA	21,7 Amps per Mo	tor		
evap c o	Air Flow: 48 m ³ /s						
cru	Coil Volume: 2.127,2 L per	unit	Additional Details Per Unit				
S C	Coil Design Pressure: 10 Bar Riser Pipe Diameter: 152,4 mm		Air Flow	47 m3/s			
St. Contraction	Riser ripe blaineter. 152,4 mm		Coil Volume	1.296,2 L per unit			
evapco	Hydraulic Data		Coil Design Pressure	10 bar			
	Spray Water Flow:	66 LPS	Riser Pipe Diameter	152,4 mm			
	Pressure Drop Through Coil: Evaporated Water Rate:	110,1 kPa					_
	cvaporated water nate:	0,34 LPS	Hydraulic Data				
			Spray Water Flow	66 lps			
			Pressure Drop Through Coil	67,8 kPa			
			Evaporated Water Rate	0,34 lps			

Comparing a third-part certified unit with a non-certified unit can be very challenging when dealing with closed circuit coolers because it is not always easy to identify the differences.

THI	RD-PART	CERTIFICAT	FION		OVE	R-ESTIN	IATED	CAPA	CITY	Y
	(1) AT\A	B 8-5K21	C 02939904		Selection Criteria	Total Each Unit	Required Capacit	y .		
duct Description		D 0-JK21	 ecarpineia 	Bevapco.k	Flow	47,8 lps 47,8 lps	1000 kW			
ATWB is a prime-surface steel coil	only closed circuit cooler, featurin	g CrossCool [™] Internal Tube	Hot Saturated Dis	charge Air	Fluid	Water Water	860.010 kcal/hr			
ancement, designed around EVAPC offers the most box size configurat				-	Entering Fluid Temp	35,0 °C 35,0 °C	227,52 Tons			
city at reduced loads. This is not to	rue for most evaporative closed ci	rcuit coolers in the industry!			Leaving Fluid Temp	30.0 °C 30.0 °C				
TWB is a maintenance friendly pr outside the unit.	oduct, designed for all routine ma	intenance to be performed			Entering Wet Bulb	25.0 °C 25.0 °C				
ction Criteria To	tal Each Unit Requi	red Capacity	a	in the second	0					
47,8	LIPS 47 81PS 1,000,0	10 kW	2	Cooled Fuid	Unit Selected					
l: Wa ring Fluid Temp: 35,		0 kcal/hr Cool Tons Dry	cal/hr Coding hs Dry Retering Adv		Introvision and a second se	pacity [1036,40 kW]				
ng Fluid Temp: 30, ing Wet Bulb: 25,		a Day Bully			10000000000000	party (1000,10 km)				
0.7 200.232	Switch	over: -7,8 C	k	~	Physical Data per Unit					
ielected					Overall Dimensions [W x L x H	2.388 mm x 6.401	mm v 2 622 mm		_	
	1 at 103,4% capacity (1.03			OT	Overall Dimensions (W X L X H	2.505 mill x 0.401	nun x 5.652 nun			
roduct line is CTI certified for water, propylene glycol or ethylene glycol as process fluid. Selection is rated in				CTI	Chinese Wester	0		-25%	Wei	ght
ct line is Eurovent (ECC) certified	 Selection is rated in accordance 	with TCR ECP-04		Contracting and	Shipping Weight	7.738 kg				0
cal Data Per Unit		IBC Design Capability			Heaviest Section	6.380 kg		-10%	Hei	ght
Dimensions (WxLxH): 2.38 ing Weight: 14.8	xH): 2.388mm x 6.401mm x 4.032mm IBC Star		BC Standard Structural Design 1.0 Importance Factor Specified							
ng Weight: 9.97 st Section: 8.62	14 kg	2.0 importance Factor Specified Seismic(Sos): up to 1.6 g, z/h = 0 Wind Load(P): up to 13.79 kPa		Fan Motor Data Per Unit			Pump Motor Data	per Unit		
s and dimensions could vary de	pending on options selected	wind Load(P):	up to 13.79 kPa		Number of Fans	2		N° of Pumps		
otor Data Per Unit		- Pump Motor Data per U	nit		1179-1270 H.C.			Nameplate		
er of Fans: 2 in Motors: 2		No.0F Pumps: 1 Nameplate Power (400)(3/50): 5,5 KW per pump motor Design Amps: could vary 11,4 Amps Per Motor *Design amps could vary		# of Fan motors	2		Power [400/3/50]		5,5 kW	
Connected Nameplate 20.0	I0 kW Per Motor I0 kW				Nameplate Power (400/3/50)	11,00 kW per motor		Design Amps		11,4 Amps per M
Nameplate FLA: 27,9	Amps Per Motor				Total connected					
plate FLA could vary					Nameplate Power	22,00 kW				
		Additional Details Per U	1.16		Typical Nameplate FLA	21,7 Amps per Moto	r			
Evolution					-					
run	\bigcirc	Air Flow: Coil Volume:	48 m ³ /s 2.127.2 L per	unit	Additional Details Per Unit					
e la	X	Coil Design Pressure:	10 Bar	Service .	Air Flow	47 m3/s				
8		Riser Pipe Diameter:	152,4 mm		Coil Volume	1.296,2 L per unit		- 25%	inct	allod
evap co		II. Jac P. Date			Coil Design Pressure	10 bar		- 25 /0	nist	aneu
evapco		Hydraulic Data			Riser Pipe Diameter	152,4 mm		100	11/0	r
		Spray Water Flow:		66 LP5				P	owe	
		Pressure Drop Through Coil: Evaporated Water Rate:		110,1 kPa 0.34 LPS	Hydraulic Data	-1		Only 6	0%	of coil
		and a second the second		0,0100	and the second se	66 lms				
					Spray Water Flow	66 lps		Vo	lum	e
0.0										
					Pressure Drop Through Coil Evaporated Water Rate	67,8 kPa 0,34 lps	_			

As a rule of thumb, be aware that the "core" of the heat transfer is the coil in a closed circuit cooler/condenser and the fill in an open cooling tower.

When possible, asking <u>the volume of the heat transfer media</u> gives an indication of the size of the heat transfer media.

Furthermore, other parameters that impact on the performances are:

a) height

- b) installed fan power
- c) weight

d) pressure drop [only for closed circuit coolers]

In this case there can be high degree of confidence on the differences between the two units in terms of thermal performance because of the clear declaration on the datasheet of

a) heat transfer media size, b) height, c) installed fan power, d) weight and e) pressure drop.

	Contraction of the second states of the second states of the	CERTIFICA	IIUII		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	R-ESTIN		
	(1) AT14	/B 8-5K21	02939904		Selection Criteria	Total Each Unit	Required Capacity	
oduct Description		10 0-JK21	ecarpineli	(Bevapco.s	Flow	47,8 lps 47,8 lps	1000 kW	
	eel coil only closed circuit cooler, featuri	ng CrossCool [™] Internal Tube	Hot Saturated Di	charge Air	Fluid	Water Water	860.010 kcal/hr	
	d EVAPCO's induced draft Advanced Tech nfigurations in the industry while also pro		-		Entering Fluid Temp	35,0 °C 35,0 °C	227,52 Tons	
city at reduced loads. This	is not true for most evaporative closed of	ircuit coolers in the industry!	1		Leaving Fluid Temp	30,0 °C 30,0 °C	OWNER	
outside the unit.	endly product, designed for all routine ma	aintenance to be performed			Entering Wet Bulb	25,0 °C 25,0 °C	OVEREST	IMALED
ection Criteria	Total Each Unit Regu	ired Capacity					THERMAI	DOWED
v:		.00 kW 10 kcal/hr coal		Cooled Fluid	Unit Selected		THERMAI	LIOWER
Fluid: Entering Fluid Temp: Leaving Fluid Temp:	Water Water 860.010 k 35,0 C 35,0 C 227,52 To 30.0 C 30.0 C	2 Tons Dry	Cal/hr Cool Dut 15 Dry Rhoning A + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +		XXXXX at 103,6% ca	pacity [1036,40 kW]		
ering Wet Bulb:	25,0 C 25,0 C Enteri	ng Dry Bulb	4			1		
Selected	Switch	lover:			Physical Data per Unit			
	8-5K21 at 103.4% capacity (1.0	33.76 kW)			Overall Dimensions [W x L x H]	2.388 mm x 6.401	mm x 3.632 mm	
luct line is CTI certified for	water, propylene glycol or ethylene glyc		in Sectionities	CTI	0	3 kg	25%	Weight
rdance with CTI Standard fuct line is Eurovent (ECC)	e with TCR ECP-04		CHETYDOLED	Shipping Weight	7.738 kg	-2.570	weigin	
					Heaviest Section	6.380 kg	-10%	Height
sical Data Per Unit all Dimensions (WxLxH):	2.388mm x 6.401mm x 4.032mm	IBC Design Capability IBC Standard Structural Design	1				1070	******
rating Weight: ping Weight:	14.869 kg 9.974 kg	Seismic(Sos):	1.0 Importance Factor Specified Seismic(Sos): up to 1.6 g, z/h = 0		Fan Motor Data Per Unit		Pump Motor Da	ta per Unit
eaviest Section: 8.620 kg Wind Lo weights and dimensions could vary depending on options selected		Wind Load(P):	Wind Load(P): up to 13.79 kPa		Number of Fans	2	N° of Pumps	
Motor Data Per Uni	t	- Pump Motor Data per	Unit				Nameplate	
ber of Fans: Fan Motors:	2 2	No.of Pumps:	No.of Pumps: 1 Nameplate Power (400/3/50): 5,5 kW per pump m Design Amps: 11,4 Amps Per Mote		# of Fan motors	2	Power [400/3/50] 5,5 kW
eplate Power (400/3/50): I Connected Nameplate	15,00 kW Per Motor 30.00 kW	Design Amps:		.p motor Motor	Nameplate Power (400/3/50)	11,00 kW per motor	Design Amps	11,4 Amps per N
	30,00 KW	*Design amps could vary		Total connected				
cal Nameplate FLA:	27,9 Amps Per Motor				Nameplate Power	22.00 kW		
cal Nameplate FLA: meplate FLA could vary					ivameptate rower	22,00 2.11		
al Nameplate FLA: seplate FLA could vary		Additional Details Por	Unit		Typical Nameplate FLA	21,7 Amps per Moto	r	
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al Nameplate FLA: neplate FLA could vary		Additional Details Per Air Flow: Coil Volume:	48 m ³ /s	unit	and the second		r	
al Nameplate FLA: neplate FLA could vary		Air Flow: Coil Volume: Coil Design Pressure:	48 m³/s 2.127,2 L per 10 Bar	unit	Typical Nameplate FLA		r	
al Nameplate FLA: neplate FLA could vary		Air Flow: Coil Volume:	48 m ³ /s 2.127,2 L per	unit	Typical Nameplate FLA Additional Details Per Unit	21,7 Amps per Moto		installed
cal Nameplate FLA: meplate FLA could vary		Air Flow: Coil Volume: Coil Design Pressure: Riser Pipe Diameter:	48 m³/s 2.127,2 L per 10 Bar	unit	Typical Nameplate FLA Additional Details Per Unit Air Flow	21,7 Amps per Moto 47 m3/s		installed
cal Nameplate FLA: meplate FLA could vary		Air Flow: Coil Volume: Coil Design Pressure: Riser Pipe Diameter: Hydraulic Data	48 m³/s 2.127,2 L per 10 Bar		Typical Nameplate FLA 	21,7 Amps per Moto 47 m3/s 1.296,2 L per unit	- 25%	
cal Nameplate FLA: meplate FLA could vary		Air Flow: Coil Volume: Coil Design Pressure: Riser Pipe Diameter:	48 m³/s 2.127,2 L per 10 Bar	unit 66 LPS 110,1 kPa	Typical Nameplate FLA Additional Details Per Unit Air Flow Coil Volume Coil Design Pressure	21,7 Amps per Moto 47 m3/s 1.296,2 L per unit 10 bar	- 25% p	ower
al Nameplate FLA: neplate FLA could vary		Air Flow: Coil Volume: Coil Design Pressure: Riser Pipe Diameter: Hydraulic Data Spray Water Flow:	48 m³/s 2.127,2 L per 10 Bar	66 LPS	Typical Nameplate FLA Additional Details Per Unit Air Flow Coil Volume Coil Design Pressure	21,7 Amps per Moto 47 m3/s 1.296,2 L per unit 10 bar	- 25% p	ower
al Nameplate FLA: neplate FLA could vary		Air Flow: Coil Volume: Coil Design Pressure: Riser Pipe Diameter: Hydraulic Data Spray Water Flow: Pressure Drop Through Coil:	48 m³/s 2.127,2 L per 10 Bar	66 LPS 110,1 kPa	Typical Nameplate FLA Additional Details Per Unit Air Flow Coil Volume Coil Design Pressure Riser Pipe Diameter	21,7 Amps per Moto 47 m3/s 1.296,2 L per unit 10 bar	- 25% p Only 6	ower 0% of coil
er in Namejate FLA: megiate FLA could vary		Air Flow: Coil Volume: Coil Design Pressure: Riser Pipe Diameter: Hydraulic Data Spray Water Flow: Pressure Drop Through Coil:	48 m³/s 2.127,2 L per 10 Bar	66 LPS 110,1 kPa	Typical Nameplate FLA Additional Details Per Unit Air Flow Coil Volume Coil Design Pressure Riser Pipe Diameter Hydraultic Data	21,7 Amps per Moto 47 m3/s 1.296.2 L per unit 10 bar 152,4 mm	- 25% p Only 6	ower

The safety margin given by CTI-Eurovent certification is easily verified with a direct comparison of constructive parameters of the two units on the two sides of the datasheet.

In particular we see that the unit on the right side has only 60% coil volume with respect to the unit on the left side and lower weight, height, electrical installed power and pressure drop.

According to the constructive parameters in the table, the real thermal capacity of the model on the right side should be about 80% that of the certified unit.

What happens to the process?

At nominal conditions the process outlet temperature is 30,5 °C.

20% of missing capacity means that the desired setpoint temperature of 30 °C is not reached for wet bulbs below than 23,7 °C.

Assuming Milano Linate as installation site, based on the weather data on https://ashraemeteo.info/v2.0/ this means <u>that for the unit on the right side of the table the desired setpoint</u> <u>temperature is not achieved for 175,2 hours/year.</u>

I HIKD-PAKI CI	ERTIFICATION	OVER-ESTIMATED CAPACITY				
(1) ATWB	9 EV21 0293990441	Selection Criteria	Total Each Unit Required Ca	pacity		
roduct Description	8-5K21 a ecarpinelli@evapco.it	Flow	47,8 lps 47,8 lps 1000 kV	N		
he ATWB is a prime-surface trate tool and to closed circuit cooler, featuring for one honsevenet, designed around TAVACDI induced data Mahanceet Technologe ne offers the most box size configurations in the inductry while also provides packing at reduced loads. This is not true for most very approach of circuits he ATWB is a maintenance friendly product, designed for all routine mainten on outside the unit.	yr (AT) tower. The ATWB g nominal dry cooling coolers in the industry! ance to be performed	Fluid Entering Fluid Temp Leaving Fluid Temp Entering Wet Bulb	Water Water \$60.010 kc 35,0 °C 35,0 °C 227,52 Tr 30,0 °C 30,0 °C 220,0 °C 25,0 °C 25,0 °C 0			
Selection Criteria Total Each Unit Required		Linerary recomo				
Execution Criteria rocal each time Recipine 20 Flow: 47,8 LPS 47,8 LPS 47,8 LPS 800,00 kW Rud: Water Water Water 800,01 kW Entering Rud: 50,01 Store 227,52 Tom 50,00 kW Entering Wat Bulb: 25,0 C 25,0 C 50,00 kW	Wher Cooled By Book By By Book By Book By Book By Book By Book By By Book By Book By Book By Book By Book By By Book By By Book By By Book By By By Book By	Unit Selected XXXX at 103,6% ca	pacity [1036,40 kW]	IERMAL POWER		
nit Selected		Physical Data per Unit				
One(1) EVAPCO ATWB 8-5K21 at 103,4% capacity (1.033,76	6 kW)	Overall Dimensions [W x L x H	2.388 mm x 6.401 mm x 3.632 m	nm		
oduct line is CTI certified for water, propylene glycol or ethylene glycol as p cordance with CTI Standard 201 RS.	process fluid. Selection is rated in	0	3 kg			
cordance with CTI Standard 201 RS. oduct line is Eurovent (ECC) certified. Selection is rated in accordance with		Shipping Weight	7.738 kg			
vsical Data Per Unit	IBC Design Capability	Heaviest Section	6.380 kg			
erall Dimensions (WxLxH): 2.388mm x 6.401mm x 4.032mm	IBC Standard Structural Design	-		-25% Weight		
serating Weight: 14.859 kg ipping Weight: 9.974 kg aviest Section: 8.620 kg	1.0 Importance Factor Specified Seismic(Sos): up to 1.6 g, z/h = 0 Wind Load(P): up to 13.79 kPa	Fan Motor Data Per Unit Number of Fans	2	-10% Height		
eights and dimensions could vary depending on options selected n Motor Data Per Unit		Number of Fans	2			
mber of Fans: 2	Pump Motor Data per Unit No.of Pumps: 1	= of Fan motors		Nameplate Power [400/3/50] 5,5 kW		
d Fan Motors: 2 meplate Power (400/3/50): 15,00 kW Per Motor	Nameplate Power (400/3/50): 5,5 kW per pump motor Design Amos: 11.4 Amps Per Motor	Nameplate Power (400/3/50)	11,00 kW per motor	Design Amps 11.4 Amps per M		
al Connected Nameplate 30,00 kW	*Design amps could vary	Total connected	11,00 KW per motor	Design Anips Per 5		
ical Nameplate FLA: 27,9 Amps Per Motor Imeplate FLA could vary		Nameplate Power	22.00 kW			
		Typical Nameplate FLA	21,7 Amps per Motor			
Evolution			ing importantia	- 25% installed		
ume	ODDECT CADACITY	Additional Details Per Unit		2070 mistanea		
	ORRECT CAPACITY	Air Flow	47 m3/s	power		
		Coil Volume	1.296,2 L per unit	Only 60% of coil		
			aller with the press statistic	Only 60% of coll		
			10 har			
evapco	= SAFER FOR THE	Coil Design Pressure	10 bar			
	= SAFER FOR THE		10 bar 152,4 mm	Volume		
evapco	= SAFER FOR THE FINAL USER	Coil Design Pressure Riser Pipe Diameter				
EMB CO		Coil Design Pressure Riser Pipe Diameter Hydraulic Data	152,4 mm			
Evapco		Coil Design Pressure Riser Pipe Diameter Hydraulic Data Spray Water Flow	152,4 mm 66 lps			
evape o		Coil Design Pressure Riser Pipe Diameter Hydraulic Data	152,4 mm			

What if the comparison is not so clear?

The real challenge about the comparison of two different solutions is that sometimes is not very easy to catch the differences on the performance parameters declared.

Even if the datasheet doesn't include all the parameters indicated or even if one of those information is not correct, the strength of the CTI-Eurovent certification is not on the entity of the numbers declared themselves, but on the reliability of the numbers declared.

If the customer is doubtful about the performance declared, if he wants to be sure of the equipment in their plant, the certification entities CTI and Eurovent give the possibility to the customer to re-verify the thermal performances of the units according to the ongoing protocol.

And If the thermal performances certified are not satisfied the customer has the right to be refunded for the deficiency.

That's the second strength point of the marks below, reliability.



Impact of certification on Key Performance Indicators of evaporative cooling technologies



Key Performance Indicators of a cooling tower are 1) Capacity (Thermal Performance); 2) Energy consumption; 3) Sound emissions and 4) Water consumption.

3.1) Thermal performances

Chapter 2 on "Third part certification vs manufacturer guaranteed performance" already sums up well the impact of CTI-Eurovent certification on thermal performances.

To stress again the concepts note that the following equivalence is valid:

Third part certification = Manufacturer forced to declare the correct capacity = safer product for the final user = no need to over-size the equipment since under-sizing the unit is forbidden by the third part entity = <u>setpoint temperature always achieved</u>.

3.2) Energy consumption

If a customer has a long-term vision of his plant he should consider that in most cases energy costs are higher than the costs of the initial investment itself.

If we take into account again the comparison of the two models in the table above, through our newer Energy and Water Analysis tool we have been able to estimate that energy consumption is much lower for the certified unit.



As a general rule note that for units operated under variable frequency drive, 20% of ratio on thermal capacity is about 50% ratio on the energy consumption.

Please note that a huge difference in energy terms comes from a minor difference on setpoint tempertatures, since you had only 0,5 °C temperature difference on the setpoint [30 °C achieved by Certified unit, 30.5 °C achieved by non-certified unit].

3.3) Sound Emission

When sound is an issue (especially in urban applications) many solutions exists to limit noise created by the unit.

Evapco features forced draft solutions with inlet and outlet attenuation systems and induced draft solutions featuring mostly sound attenuation solutions without loss of thermal capacity (water silencers, super low sound fans, offset sound attenuation walls).

It must be underlined that CTI-Eurovent itself is a further warranty of the reduction of the noise emission, because having an implicit safety factor on the thermal performances means that in real conditions units are going to operate at lower fan speed.



3.4) Water Consumption and possibility to achieve dry performances.

Evapco features fully evaporative to fully dry units.

For open circuit cooling towers there is no possibility to achieve water savings on the evaporative part, but only on the blowdown of the unit.

For closed circuit coolers/condensers (from fully evaporative to fully dry) there are several possibilities to achieve water savings. Water savings on evaporative part will automatically bring water savings and also on the blowdown part through reduced consumption of chemical products.

The Key Parameter Indicators of Water saving are the followings:

- 1) Dry Bulb Switch-Over for evaporative and hybrid coolers;
- 2) Percentage of dry load [specifically for eco-ATWB-H];
- 3) Depressed Dry Bulb for Adiabatic coolers;
- 4) For dry coolers/condensers only dry mode exists.





All of them are indicated at 100% thermal power on Evapco's datasheet and the safety factor implicit in the third-part certification process makes the possibility to achieve water savings very interesting as well.



As we can see after running a Water analysis according to our newest software of advanced calculation, the water consumption of the unit not certified is 20% more than the Evapco's certified ATWB. Please note that ATWB is a unit with smooth coil with limited capacity of working in dry mode. Only due to CTI-ECC certification of thermal performance it can achieve 20% of water savings with respect to a not certified unit.

Conclusion

CTI-Eurovent certification not only assures thermal performance but also limits noise pollution and promotes water and energy conservation, aligning with global sustainability objectives.

In conclusion, CTI-Eurovent certification transcends mere compliance, embodying a commitment to performance, efficiency, and sustainability in evaporative cooling technologies. Its impact resonates throughout the industry, shaping standards, and driving innovation towards a more resilient and resource-efficient future.