especial.

Refrigeration | AC & Ventilation | Heat Pumps

13.-15.10.2020

CONNECTING EXPERTS.

NÜRNBERG MESSE



ASEVALCU Software ... the bridge between

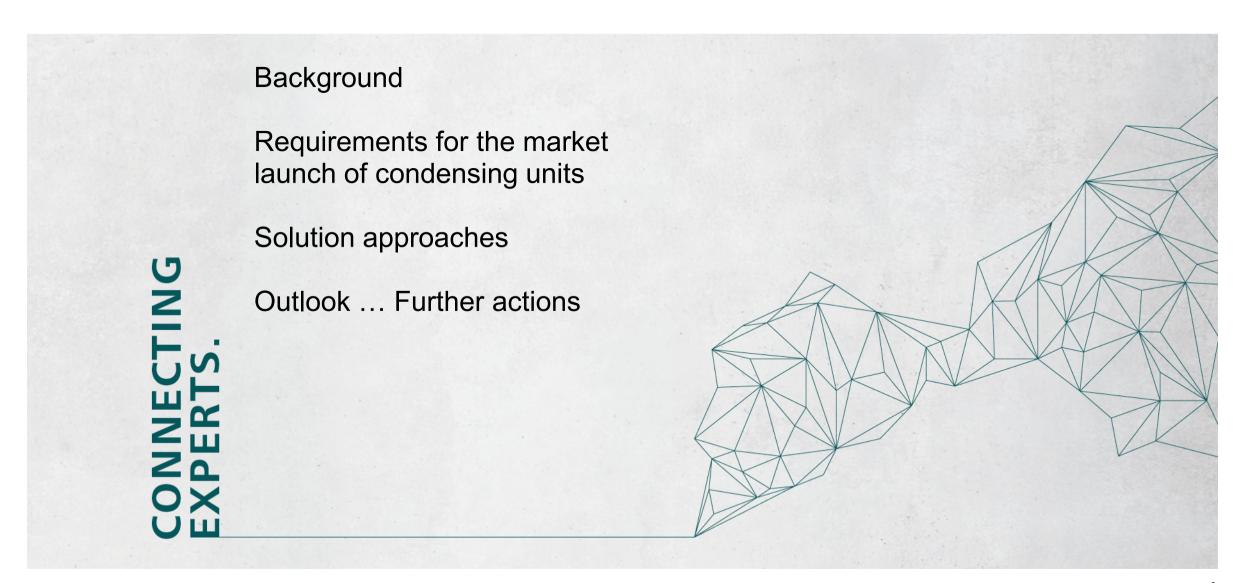
- Engineering
- Data Processing
- Certification

Wolfgang Zaremski, President ASERCOM



ASEVALCU Software







EUROPEANS 2030 targets NEW EU's climate goals

❖ 55% or 60% less CO2 emissions?





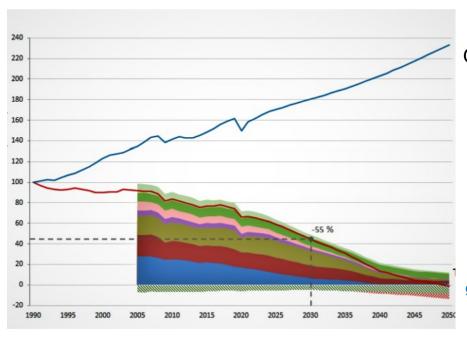
How can we reach the goal?



EUROPEANS 2030 targets NEW EU's climate goals

How can we reach the goal?
One Solution:

The European Green Deal



GDP

INDUSTRY GOAL

Support industry to innovate and to become global leaders

greenhouse gases CO2 by sector



The Road Ecodesign Directive 2009/125/EC

This Directive establishes a framework for the setting of Community ecodesign requirements for energy-related products with the aim of ensuring the free movement of such products within the internal market

Support industry to innovate and to become global leaders



Ecodesign Directive 2009/125/EC Field of application Condensing units ENTR Lot 1

MT to -10°C LT to -35°C

Air-cooled Condensing Units

COP Coefficient of performance SEPR Seasonal Energy Performance Ratio Tier-2 Application of the regulation from July 1st, 2018 in place

application	Refrigeration capacity COP tumg. 32°C	MEPS Tier - 2	SEPR		
MT application	0,2 kW< 1 kW 1 kW - < 5 kW	1,4 1,6	5 – 50 kW		
LT application	0,1 kW - < 0,4 kW 1 kW < - 2 kW	0,8 0,95	2 – 20 kW		

CONDENSING UNITS according to EU 2015/1095



Requirements for the market launch of condensing units

> CE Confirmatory declaration regarding efficiency assessment

> MEPS

➤ Other technical requirements

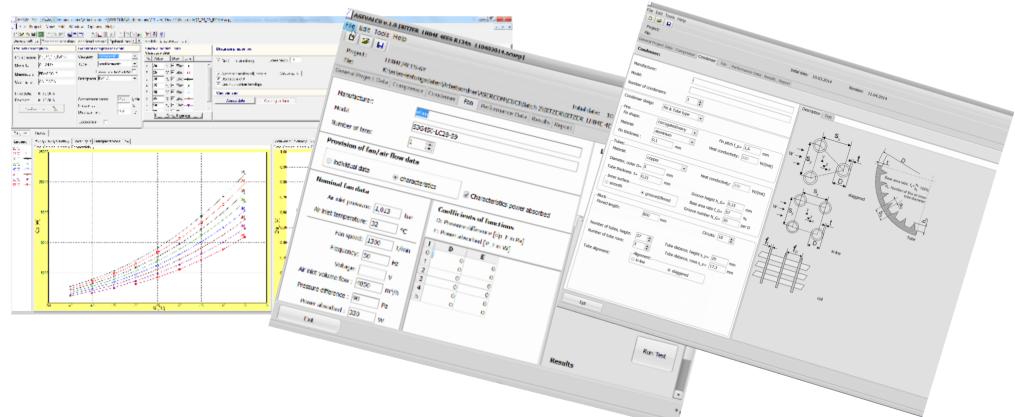






ASEVALCU the easy Engineering & Certification Tool





- Developed by ASERCOM to assist condensing unit engineering
- Assist ecodesign EU 2015/1095 certification
- Recalculates compressor and condensing unit performance
- Check plausibility
- Generate performance data for documentation and catalogues

The Tool to ENGINEERING CONDENSING UNITS



ASERCOM ASEVALCU SOFTWARE ... the easy tool

Input Data

Module to be developed

Output Data

CU GENERAL DATA

COMPRESSOR DATA

CONDENSER DATA

FAN DATA

DECLARED PERFORMANCE DATA

ASEVALCU DLL

COMPRESSOR TEST

CONDENSER TEST

FAN FITTING

CALCULATED PERFORMANCES

SEPR ANALYSIS VS MEPS

CREATE PROJECT FILE



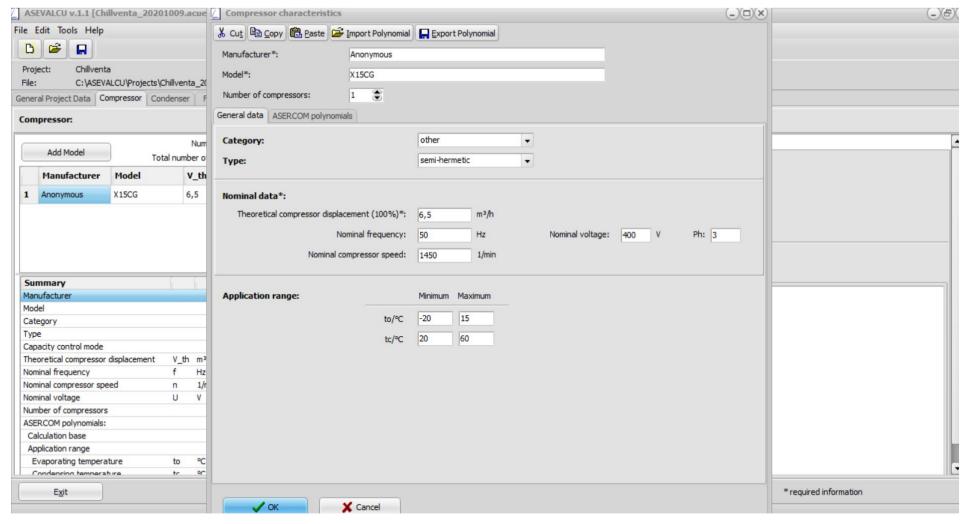
ASEVALCU Software

ASEVALCU v.1.1 [Chillventa_20201009.acuep]		(=)(=)(-
File Edit Tools Help		
<u>്</u> 🚅 📮		
Project: Chillventa	Initial date: 09.10.2020 Revision: 09.10.2020	
File: C:\ASEVALCU\Projects\Chillventa_20201009.acuep		
General Project Data Compressor Condenser Fan Performance Data Res	its Report	
Condensing unit: Sample, Condenising Unit		
Project*: Chillventa	Refrigerant: R448A ▼ other	
Manufacturer*: Sample	Cycle type—	
Model*: Condenising Unit	Cycle type: • Single	
User name: Wolfgang Zaremski	○ With economizer	
Total number of condensers: 1 Comments:	Suction gas Reference points (EN 13215)* Dtg1 = 10 K → High temperature: 5°C/10 K/32°C → Medium temperature: -10°C/10 K/32°C Low temperature: -35°C/10 K/32°C → Household: -25°C/32°C/32°C	(manufacturer reference)
	Liquid subcooling: 1 K (default)	
	Application range: Minimum Maximum Evaporating temperature: -40 -10 °C Air temperature: 30 60 °C	
Exit		* required information

Easy start with the project file



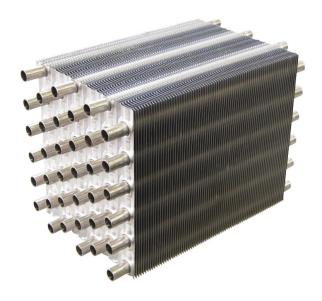
ASEVALCU Software



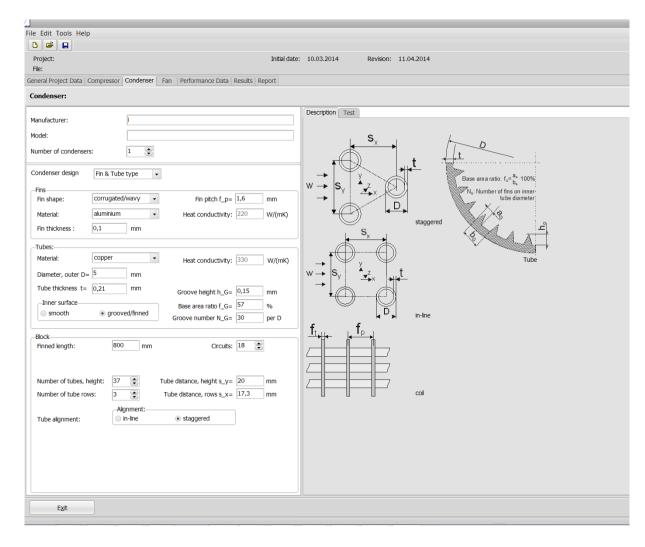
Compressor data input



ASEVALCU Software



- Condenser data input
 - Finned length
 - Fin type (flat, corrugated, louvered)
 - Fin thickness
 - Fin pitch
 - Fin material
 - Tube outside diameter

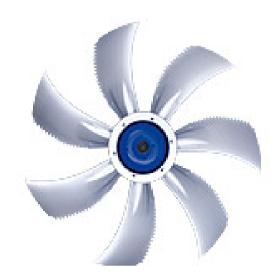




ASEVALCU Software

C:\ASEVALCU\Projects\Chillve al Project Data Compressor Condens		e Data Results Report	
nufacturer: anonymous del 4-400 mber of fans: 1 © ovision of fan/air flow data			Legends
individual data	Coefficients of func D: Pressure difference E: Power absorbed [P	e [dp_F in Pa] _F in W]	Test Input data Condenser: anonymous - 418 Air side surface: 8,048 m² Air inlet pressure: 1,013 bar
Fan speed: 1150 1/min Frequency: 50 Hz Voltage: 230 V Vir inlet volume flow: 3000 m³/h Pressure difference: 15 Pa Power absorbed: 120 W	i D 0 0 1 0 3 0	E 0 0 0 0 0 0	Air inlet temperature: 32 °C Run Test Results Air inlet volume flow: 3000 m³/h Air pressure drop: 15,15 Pa Total power absorbed: 120 W

Fan data input





ASEVALCU Software

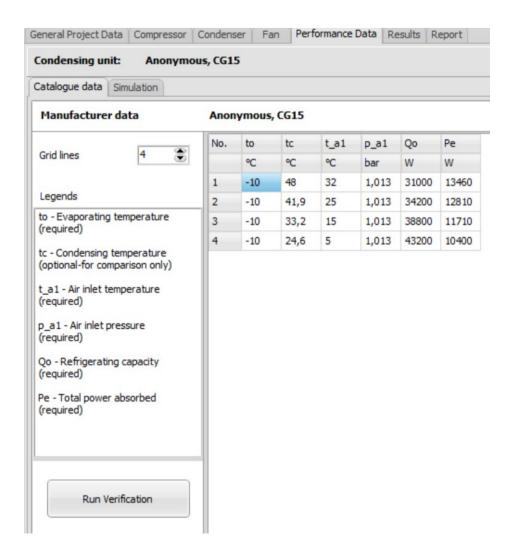
Summary								
No.	Parameter	Declared	Test	Check	Comment			
1	Condensing unit							
2	Number of data sets	4	4	OK				
3	Reference conditions defined							
4	Invalid application range to							
5	Invalid application range t_A,in							
6	Evaluation index	-	1	OK				
7								
8	Compressor			OK				
9	Polynomials			OK				
10	Application range tc_max	60	49,6	OK				
11								
12	Condenser							
13								
14	Fan			OK				
15								

First check before performance control... Parameter Input check

CERTIFICATION CONDENSING UNITS



ASEVALCU Software

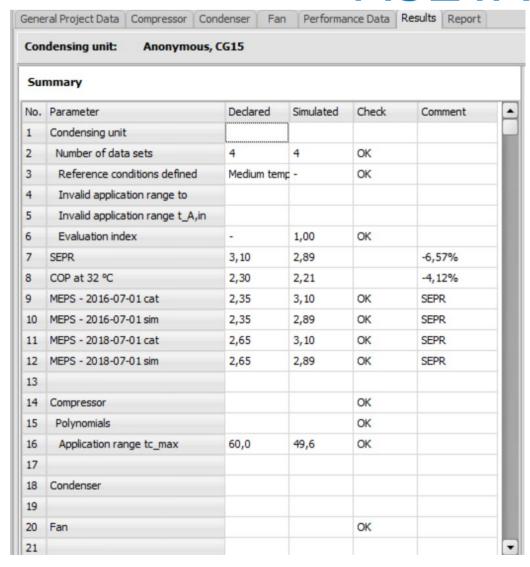


Second check Performance data check

CERTIFICATION CONDENSING UNITS



ASEVALCU Software



MEPS check according EU 2015/1095 Tier-2 since 1st July 2018



ASEVALCU the easy way for condensing unit certification especially

"Certified" performance by ASERCOM

the unit has been certified by the ASERCOM certification committee



ASERCOM web-side visit



Manufacturer		Refrigerant		Туре		Application		Voltage		Status	
- Any -	*	- Any -	*	- Any -	*	- Any -	*	- Any -	*	- Any -	*
Cooling Cap* between 2	and	3 kW Ap	ply Filter								

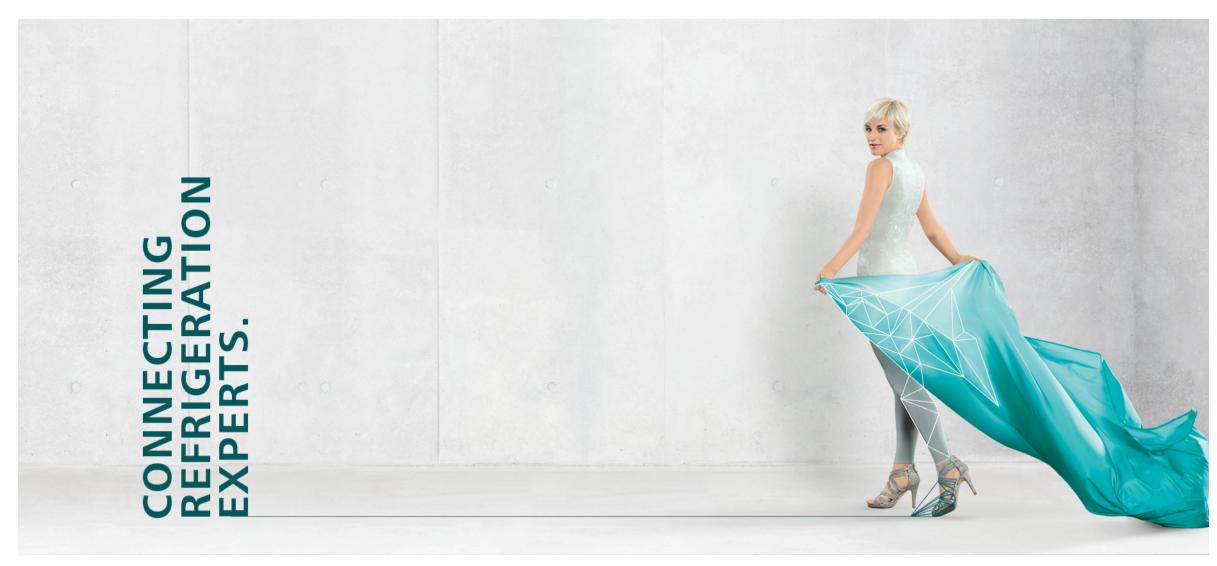
*Cooling Cap at to/tamb=-10°C/32°C or -35°C/32°C

Registration	Manufacturer	Unit	Refrigerant	Application	Cooling Capacity [kW]	Suc. Cond.	Туре	Voltage	Status	Ecodesign data
ACU0127	BITZER	LH33E/2HES-2	R134a	MT	2,01 kW	20°C	Piston	400/3/50	Certified	link
ACU0102	ZANOTTI	GCU1015UxxxE	R134a	MT	2,08 kW	20°C	Piston	230/1/50	Certified	
ACU0115	TECHNOBLOCK	UTLU1015	R134a	MT	2,08 kW	20°C	Piston	230/1/50	Certified	
ACU0070	GEA BOCK	SHGX12P/75-4 L	R134a	MT	2,14 kW	20°C	Piston	400/3/50	Certified	link
ACU0048	EMERSON	MC-D8-ZB15KE-TFD	R134a	MT	2,19 kW	20°C	Scroll	400/3/50	Certified	
ACU0091	TECUMSEH	SILFH4518Y-FZ	R134a	MT	2,22 kW	20°C	piston	230/1/50	Certified	
ACU0092	TECUMSEH	SILFH4518Y-TZ	R134a	MT	2,24 kW	20°C	piston	400/3/50	Certified	
ACU0150	EMERSON	ZXME020E-TFD	R134a	MT	2,25 kW	20°C	Scroll	400/3/50	Certified	
ACU0177	TECUMSEH	FHT4518YHR-FZ	R134a	MT	2,26 kW	20°C	piston	230/1/50	Certified	
ACU0178	TECUMSEH	TFHT4518YHR-TZ	R134a	MT	2,28 kW	20°C	piston	400/3/50	Certified	
ACU0128	BITZER	LH33E/2GES-2	R134a	MT	2,33 kW	20°C	Piston	400/3/50	Certified	link
ACU0129	BITZER	LH44E/2GES-2	R134a	MT	2,39 kW	20°C	Piston	400/3/50	Certified	link
ACU0049	EMERSON	MC-D8-ZB19KE-TFD	R134a	MT	2,50 kW	20°C	Scroll	400/3/50	Certified	
ACU0071	GEA BOCK	SHGX12P/90-4 L	R134a	MT	2,52 kW	20°C	Piston	400/3/50	Certified	link
ACU0151	EMERSON	ZXME025E-TFD	R134a	MT	2,65 kW	20°C	Scroll	400/3/50	Certified	
ACU0072	GEA BOCK	SHGX12P/110-4 L	R134a	MT	2,90 kW	20°C	Piston	400/3/50	Certified	link
ACU0130	BITZER	LH44E/2FES-3	R134a	MT	2,90 kW	20°C	Piston	400/3/50	Certified	link
	BITZER	LH33E/2HES-1	R134a	MT	2,01 kW	20°C	Piston	400/3/50	Checked	link
	TECUMSEH	WINAJ9513Z-FZ	R452A	MT	2,02 kW	20°C	piston	230/1/50	Checked	
	TECUMSEH	FHT4518YHR-FZ	R513A	MT	2,02 kW	20°C	piston	230/1/50	Checked	

Total Number today: more than 6000 units on the *ASERCOM* web-side

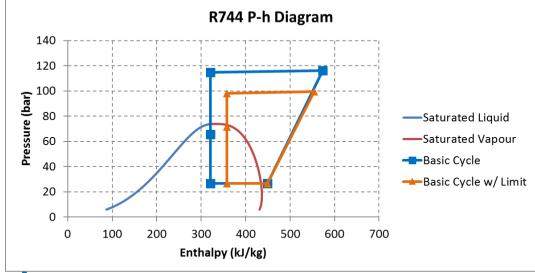
OUTLOOK...further action





Ongoing Software development for ASEVALCU





Target projects in 2020

- ➤ Tool for CO₂ gas cooler unit system simulation
 - Including gas cooler simulation
- Microchannel heat exchanger modul

Outlook ... Further actions



- Expanding ASERCOMs condensing unit certification program in European Market Place
- ASERCOMs certification program is open for none ASERCOM member
- Supporting local Market Surveillance Agencies if requested
- Focus on natural refrigerants
- ASEVALCU is ready for condensing unit certification with natural refrigerants

Outlook ... Further actions ASERCOM Market Surveillance activities



- Missing market surveillance activities lead to unfair competition between non-compliant products and compliant products
- Market Surveillance Agencies does not have the budget or the expertise to proper condensing units control
- ASERCOM certification program is very well accepted
- Private product certification schemes lead by HVAC & R industry help to fill this gap
- ASERCOMs certification program could be the answer



ASERCOM's Certification Software Tools

> Several Software tools developed by ASERCOM

> ASEVALCU

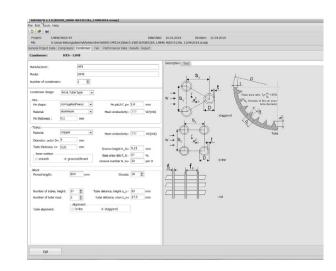
- Assists engineering by calculating and pairing different condenser fans, compressors and new refrigerants
- Generates performance data for documentation and catalogues
- Extension with CO2 units calculations

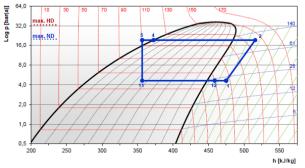
> ASEVAL

Assists creating compressor performance data and documentation

> ASEREP II

> ASERCOM refrigerant library for all upcoming and existing refrigerants to be used in engineering, certification and the official selection software products of the manufacturers





Outlook ... Further actions



ASEVALCU Software The easy tool to support EU's CO2 reduction plan





Thank you for your attention.

