

Report from Certification Committee

ASERCOM Annual Convention 2019

Julian Pfaffl

Chair ASERCOM Certification Programme

Brussels, 25th January 2019

- ❑ Report from Certification in 2018
 - Participants
 - Facts and Figures
 - Testing
 - Check of Published Data
 - Audits
- ❑ Certification Process for Condensing Units
- ❑ Summary

Compressor CC Members

□ Bitzer Kühlmaschinenbau GmbH	J. Pfaffl	
□ Danfoss Commercial Compressors	C. Dumas (Convenor)	
□ Emerson Climate Technologies	L. Bravenec	
□ Frascold S.p.A	M. Perri	
□ GEA Bock GmbH	M. Polzer (Convener 2019)	
□ Officine Mario Dorin S.p.A.	L. Fanetti	
□ Tecumseh Europe S.A.	F. Finet	
□ TÜV SÜD (notified body)	P. Schnepf	

In alphabetical order of Company Name

Condensing Unit CC Members

- Bitzer M. Koffler /J. Pfaffl
- Danfoss G. Renevier / C. Brac
- Dorin L. Fanetti
- Embraco F. Harcar / M. Zgliczynski
- Emerson R. Cap / F. Rinne
- Epta: Costan / Misa F. Mastrapasqua
- Frascold M. Perri / M. Bertolussi
- GEA Bock O. Friess
- SCM Frigo A. Battisti / M. Bernabei
- Tecumseh F. Finet, F. Guy
- Teko A. Wirsching
- Zanotti / Technoblock L. Bulgarelli
- TÜV süd P. Schnepf



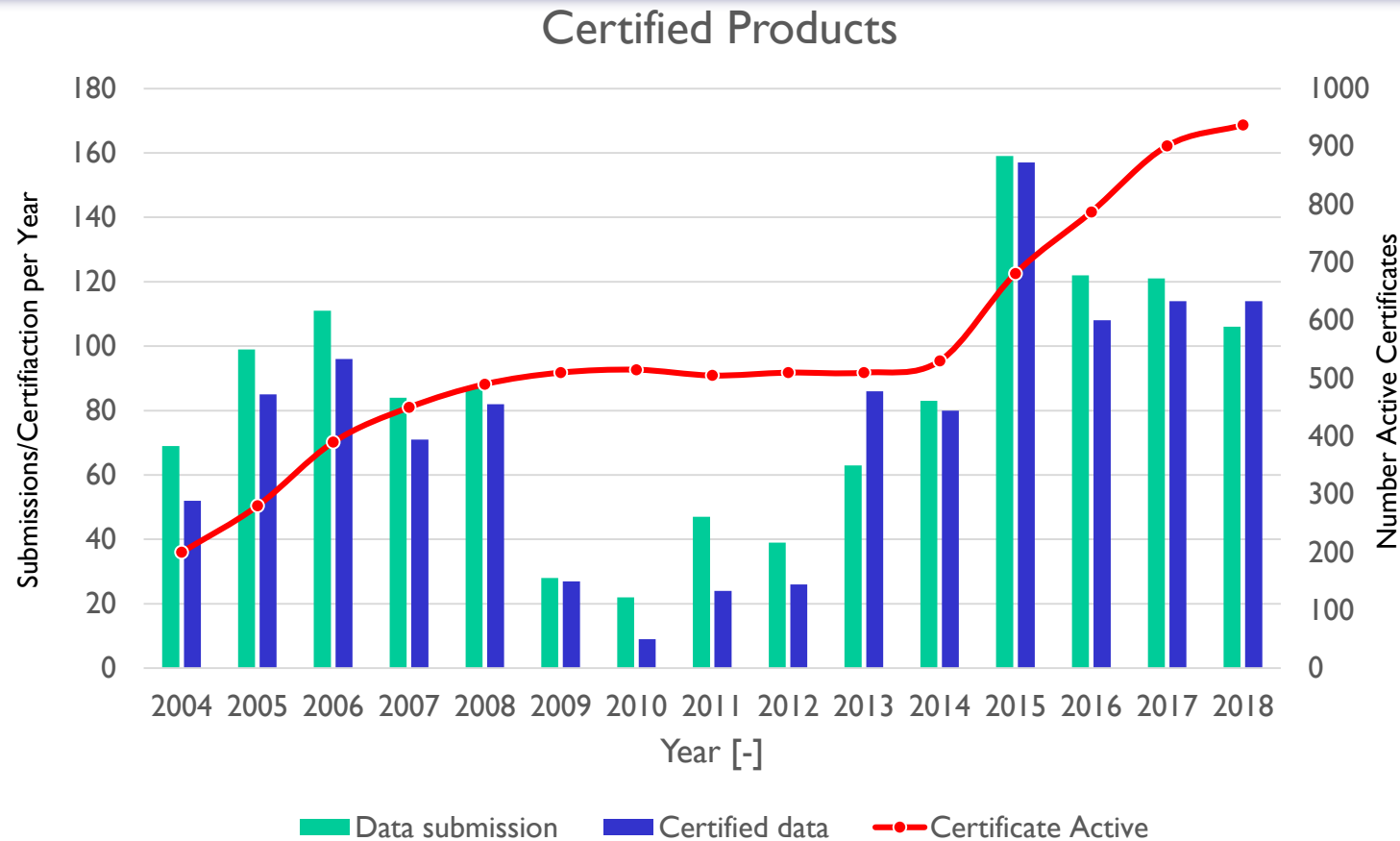
New Senior Delegate

- ❑ **Christian Desjardins retired end of 2018**
 - Leading Part to build up the Condensing Unit Certification Program
 - Was working for 4 Years as ASERCOM Senior Delegate

- ❑ **Dr.-Ing. Norbert Kämmer on board as of October 2018**
 - VP Engineering with Emerson Climate Technologies until September 2015

- ❑ **Senior delegate function like Christian Desjardins**
 - Maintain functions and responsibilities like Christian
 - Overlapping with Christian until December 2018
 - Taking over full function January 2019
 - Christian still providing support until December 2018

Certification Figures in 2018 – Compressors and Condensing Units



- ❑ 106 sets of data submitted in 3 batches
- ❑ 114 compressors and condensing units certified
- ❑ On average 13% of submitted products are tested
- ❑ 950 certified products active

Compressor and Condensing Unit Conformity Tests 2018



- ❑ 7 Condensing units have been tested out of 71 submitted units
- ❑ 8 Compressors have been tested out of 35 submitted compressors
- ❑ 4 External labs qualified and in use (ISO 17025 accreditation)

Check of Published Data (ASERCOM Checked)

Internal Market Surveillance checks

- 1376 Condensing Units have been checked by the Senior Delegate in 2018

Checked:

- Availability of the Ecodesign product datasheet
- Data from the Ecodesign datasheet

Refrigerant: R449A

Item	Symbol*	Value		Unit
Evaporating temperature	t	-10	-35	°C
Annual electricity consumption	Q	51663	31881	kWh/a
Seasonal Energy Performance Ratio	SEPR	3,26	1,84	

Point A: Parameters at full load and ambient temperature 32°C

Rated cooling capacity	P _A	27,4	7,87	kW
Rated power input	D _A	11,61	5,47	kW
Rated COP	COP _A	2,36	1,44	

Point B: Parameters at part load and ambient temperature 25°C

Declared cooling capacity	P _B	30,4	9,07	kW
Declared power input	D _B	11,02	5,57	kW
Declared COP	COP _B	2,76	1,63	

Point C: Parameters at part load and ambient temperature 15°C

Declared cooling capacity	P _C	34,7	10,85	kW
Declared power input	D _C	10,00	5,57	kW
Declared COP	COP _C	3,47	1,95	

Point D: Parameters at part load and ambient temperature 5°C

Declared cooling capacity	P _D	39,1	12,68	kW
Declared power input	D _D	8,78	5,42	kW
Declared COP	COP _D	4,45	2,34	

Point E: Parameters at full load and ambient temperature 43°C (information only)

Declared cooling capacity	P _E	22,7	6,10	kW
Declared power input	D _E	12,30	5,13	kW
Declared COP	COP _E	1,85	1,19	

Other items

Capacity Control	—			
Reference temperature	Dew point temp.			
Suction gas temperature	toh	20°C		
Power voltage	Net	400V/50Hz		
Coefficient of degradation for units w/o capacity control**	Cdc	0,25		

First CO2 Condensing Unit Certified



- ❑ ASERCOM has certified the first CO2 Condensing Unit in 2018
 - 50 CO2 Compressors have already been certified
- ❑ Transcritical CO2 Unit
- ❑ 14kW Cooling Capacity
- ❑ SEPR has been verified via external Lab Test
- ❑ Working Group has been established (lead by Dr. Rinne)

Challenges:

- ❑ Update ASEVALCU to integrate transcritical process and various system configurations
- ❑ Heat exchanger module for gas coolers
- ❑ Qualify Labs for conformity testing

Certification:

- 3 Batches scheduled for compressors in 2019:
 - Batch 49, January in Brussels
 - Batch 50, April in Munich
 - Batch 51, November
- 1 Batch scheduled for condensing units:
 - Batch 9, May in Munich

Certification Process for Condensing Units

Process for Condensing Units

- In 2018 new certification statuses were introduced

Status	Meaning
Listed	Product submitted to ASERCOM (Jan 2019 4936 Products)
Checked	Ecodesign Datasheet and Ecodesign Conformity has been checked by ASERCOM Senior Delegates (Jan 2019 1376 Products)
Certified	Unit has been certified by the Certification Committee (Jan 2019 277 Products)

- **Build up a unique database of condensing units for the market**

New Process for Condensing Units

- Website has been prepared to list listed, checked and certified products
 - Includes specific search functionality for customer to look for different brands and find the right cooling capacity and refrigerant
 - Easy access to the Ecodesign documentation

Filter list by

Manufacturer:
 Refrigerant:
 Type:
 Application:
 Voltage:
 Status:

Cooling Cap*

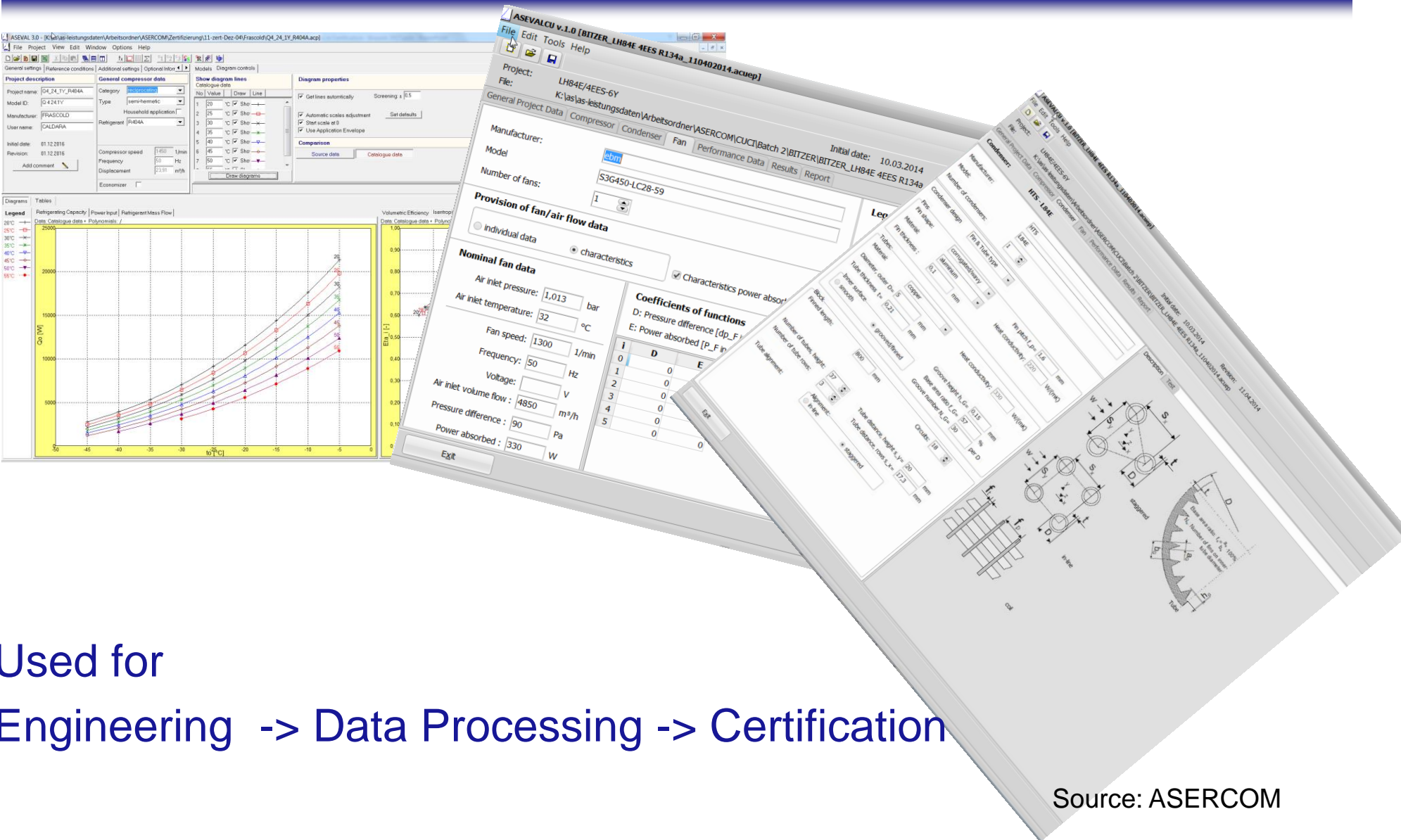
between 3.3 and 100 kW

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

Registration	Manufacturer	Unit	Refrigerant	Application	Cooling Capacity [kW]	Suc. Cond.	Type	Voltage	Status	Ecodesign data
ACU0073	GEA Bock	SHGX22e/125-4 L	R134a	MT	3,31 kW	20 °C	Piston	400/3/50	Certified	link
ACU0103	Zanotti	GCU2020RxxxE	R134a	MT	3,44 kW	20°C	Piston	400/3/50	Certified	
ACU0031	BITZER	LH44E/2EES-2	R134a	MT	3,48 kW	20°C	Piston	400/3/50	Certified	link
ACU0059	FRASCOLD	LB-D211-0Y-1M	R134a	MT	3,53 kW	20°C	Piston	400/3/50	Certified	
ACU0051	EMERSON	MC-H8-ZB26KE-TFD	R134a	MT	3,67 kW	20°C	Scroll	400/3/50	Certified	link
ACU0064	FRASCOLD	LB-D211-0Y-2M	R134a	MT	3,68 kW	20°C	Piston	400/3/50	Certified	
ACU0162	SCM FRIGO	BRQ2 B 020 MT	R134a	MT	3,76 kW	20°C	Piston	400/3/50	Certified	
ACU0035	BITZER	LH64E/2EES-3	R134a	MT	3,79 kW	20°C	Piston	400/3/50	Certified	link
ACU0206	TECUMSEH	TAGT4534YHR-TZ	R134a	MT	3,94 kW	20°C	piston	400/3/50	Certified	

Source: ASERCOM

Certification Software Tools



The screenshot displays the ASEVALU v.1.0 software interface, which is used for condensing unit certification. The interface is divided into several sections:

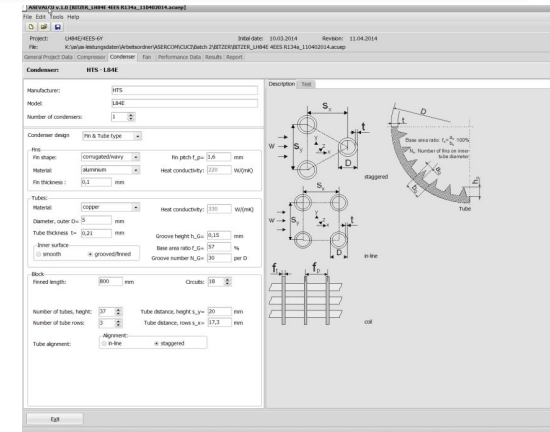
- Project Description:** Includes fields for Project name, Model ID, Manufacturer, User name, Initial date, and Revision.
- General compressor data:** Includes Category, Type, Refrigerant, Compressor speed, Frequency, Displacement, and Economizer.
- Diagram properties:** Includes options for 'Get lines automatically', 'Automatic scales adjustment', and 'Line Application Envelope'.
- General Project Data:** Includes Manufacturer (ebm), Model (S3G450-LC28-59), Number of fans (1), and Initial date (10.03.2014).
- Nominal fan data:** Includes Air inlet pressure (1,013 bar), Air inlet temperature (32 °C), Fan speed (1300 1/min), Frequency (50 Hz), Voltage, Air inlet volume flow (4850 m³/h), Pressure difference (90 Pa), and Power absorbed (330 W).
- Coefficients of functions:** A table with columns D and E, and rows 0 through 5.
- Performance Graphs:** Two graphs showing Refrigerant Mass Flow (kg/h) and Volumetric Efficiency (l/min) versus Air Inlet Temperature (°C).
- Technical Diagrams:** Detailed diagrams of the condenser and fan assembly, including dimensions and labels.

Used for
Engineering -> Data Processing -> Certification

Source: ASERCOM

Certification Software Tools

- ❑ Developed by ASERCOM
- ❑ Assists engineering by calculating and pairing different condenser designs, fans, compressors and new refrigerants
- ❑ Generate performance data for documentation and catalogues
- ❑ Check plausibility of existing performance data
- ❑ Prepare data for the certification process
- ❑ Used during certification process



	-25	-20	-15	-10	-5	0	5
30	2300	2880	3550	4350	5250	6250	7450
40	1870	2400	3000	3700	4450	5350	6350
50		1840	2370	2950	3600	4350	5150
30	2890	3550	4350	5250	6300	7500	8900
40	2490	3050	3750	4550	5450	6500	7700
50		2540	3100	3750	4550	5450	6450
30	3450	4300	5250	6350	7650	9100	10750
40	3000	3700	4550	5500	6600	7900	9350
50		3100	3750	4550	5500	6550	7800
30	4050	5000	6100	7350	8850	10550	12500
40	3500	4300	5250	6350	7650	9100	10800
50		3550	4350	5300	6400	7650	9100
30	4750	5900	7200	8700	10450	12450	14650
40	4050	5050	6200	7500	9050	10750	12750
50		4150	5100	6200	7500	9000	10750
30	5900	7300	8900	10800	12950	15400	18200
40	5100	6250	7700	9300	11200	13350	15800
50		5200	6350	7750	9350	11200	13300

Source: ASERCOM

Trusted certification since 1999

- ❑ Open scheme, large coverage, cost efficient
- ❑ Transparent unit overview for consumers
- ❑ Trustworthy information to the market supported by 3rd party review
- ❑ Fast and cost effective Software tools for
 - Condensing Unit development
 - Generation of catalogue data
 - Submission of condensing units