

## Deliverable D8.2: Final Report on Access to the ECAC infrastructure

Stephanie Schüttauf, Alfred Wiedensohler, Evelyn Freney, Jean-Philippe Putaud

Work package no	WP8
Deliverable no.	D8.2.
Lead beneficiary	TROPOS
Deliverable type	<input type="checkbox"/> <b><u>R (Document, report)</u></b> <input type="checkbox"/> DEC (Websites, patent fillings, videos, etc.) <input type="checkbox"/> OTHER: please specify .....
Dissemination level	<input type="checkbox"/> <b><u>PU (public)</u></b> <input type="checkbox"/> CO (confidential, only for members of the Consortium, incl Commission)
Estimated delivery date	Month 48
Actual delivery date	09/05/2019
Version	1
Comments	

The European Centre for Aerosol Calibration, ECAC, consists of 3 installations, the World Calibration Centre for Aerosol Physics (WCCAP), the Aerosol Chemical Speciation Monitor Calibration Centre (ACMCC), and the European Reference Laboratory for Air Pollution (ERLAP). The ECAC represents a facility for calibrating and testing new instrumentations within the European Aerosol community and beyond. The main goals of the ECAC are the quality-assurance of physical, optical and chemical in-situ measurements as well as the capacity building to perform high-quality physical, optical and chemical in-situ aerosol characterization. These aims are achieved through the organization of instrument intercomparison and calibration workshops, round-robin tests and on-site intercomparison with reference instruments.

### [Access to ECAC](#)

#### ECAC-WCCAP

The first call for access via TNA was launched in July 2015. Since then, 85 calibration- and intercomparison workshops have been carried out, addressing the following instruments: (1) Absorption Photometer, (2) Condensation Particle Counter, (3) Mobility Particle Size Spectrometer, (4) Integrating Nephelometer and (5) Extinction Monitor. There was also the possibility to apply for On-Site Intercomparison.

For TNA, a total of 228 applications were received and reviewed. All proposals met the evaluation criteria. Due to technical problems or other liabilities 46 applicants could not attend the workshop. 211 out of 228 were EU-members and 17 non-EU-members. 644 out of 605 RWDs have been used. 96% of the applications were related to universities and research institutes, 2% were SMEs and 2% OTHs. Regarding the participants: 24% were female and 76% male.

Beside the TNA, the WCCAP received also national requests for calibration. In total, 351 calibrations have been requested. All applicants attended the workshops. The work done for these calibration and intercomparison workshops equals 1020 RWDs. 56% of the applications came from universities or research institutions and 42% from the public sector. SMEs accounted for 2% of the calibration participants. The numbers of instruments related to the individual workshops as well as the used RWDs are listed in Table 1.

Table 1: overview of participated instruments related to the single workshops

Workshop related to...	No. of instruments		No. of RWD	
	TNA	National	TNA	National
Absorption photometer	38	17	152	68
Condensation Particle Counter	70	216	140	432
Mobility Particle Size Spectrometer	40	64	160	256
Integrating Nephelometer	25	6	100	24
Extinction Monitor	3	/	12	/
CCNC	4	/	20	/
On-Site Intercomparison	2	48	20	240

#### ECAC-ACMCC

The 1<sup>st</sup> call for the TNA was launched in October 2015, the 2<sup>nd</sup> in April 2018. A total of 31 applications were received and reviewed. All proposals met the evaluation criteria. Due to technical problems or other liabilities 5 applicants could not attend the workshops. The choice to perform two back to back intercomparison workshops in 2016 was driven to meet the need to accommodate all applicants during a short period, as well as to compare the newer model of the ACSM instrument (the Time of Flight ACSM (ToF-ACSM)) with the traditional model. All participants were EU-members. 91% of the proposals have been from universities and research institutes and 9% from the private/public sector. Related to the participants: 54% of them were female, 46% male. Altogether the ACMCC provided 290 RWD.

Similar to the WCCAP, the ACMCC was open to national requests. Within the performed intercomparison, 4 applications came from French national facilities from the research sector.

ECAC-ERLAP

The 1<sup>st</sup> call for TNA was launched in November 2015, other calls followed: one in 2016, two in 2017, one in 2018 and one in 2019. A total of 107 applications were received and evaluated by the reviewer panel. All proposals met the requirements of the scientific criteria. Due to technical problems or other liabilities 8 applicants could not attend the workshops. Up to now 6 round-robin-tests were carried out. Most of the participants were EU-members or related to associated countries. Only 2 participants were non-EU. 85% of the proposals came from universities and research institutes, 7% from the private/public sector and 8% form OTH. Related to the participants: 58% of them were female, 42% male. To date, ERLAP provided an access of 300 RWD out of the 135 RWD planned for the entire duration of the project.

Quality of the data

The quality of data within the ECAC is related to the conditions of the instruments, which took part in the workshops. Therefore we provide here an overview about the percentage of systems, which passed and failed the requirements of the calibration- and intercomparison workshops (for TNA, figure 1, and for national requests, figure 2).

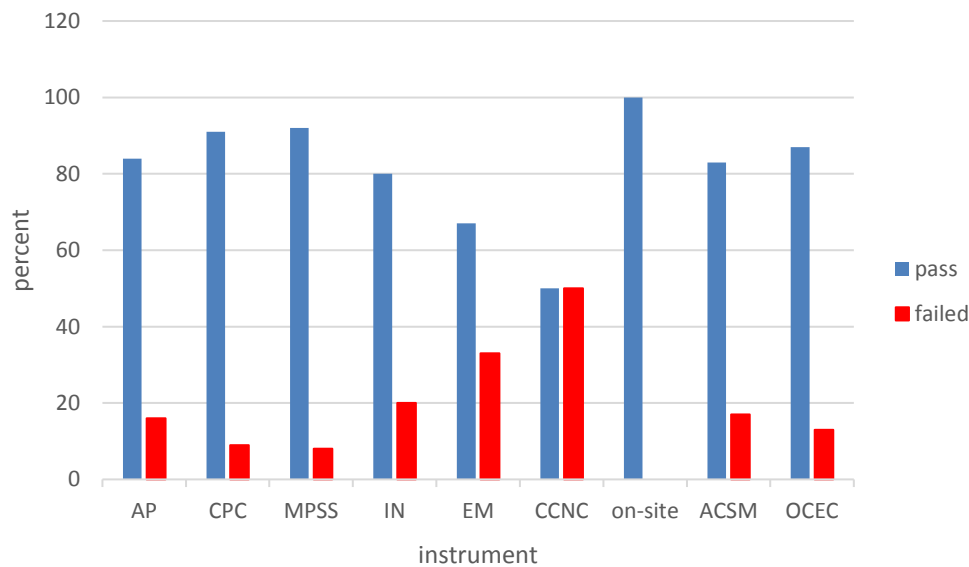


Figure 1: TNA - percentage of instruments which passed/failed the workshops

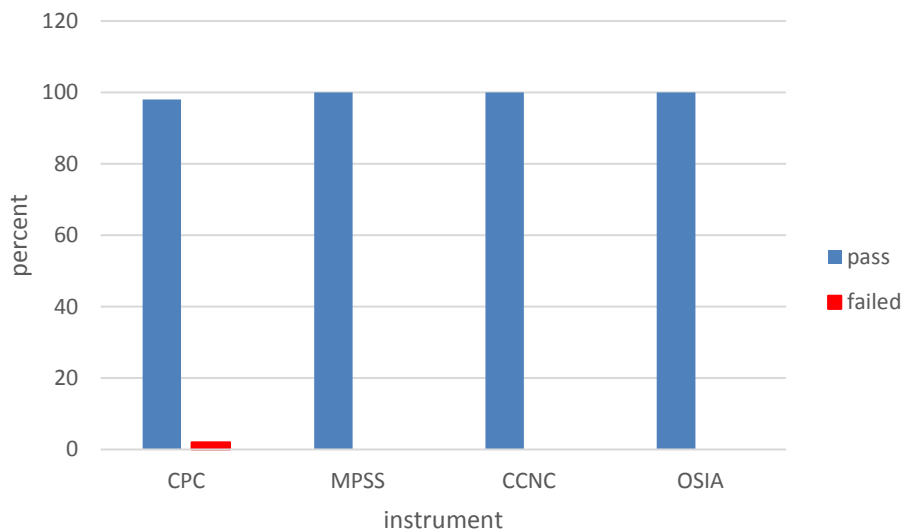


Figure 2: national – percentage of instruments which passed/failed the workshops

For more information, we also show an overview about the conditions of the systems before (pre-status) and after the workshops (final status). A system was in ‘good condition’ when it met the requirements of the “normal” working condition. This means e.g. complete hardware, running software, no need to change parts of the instruments, no significant deviations related to the reference instrument etc. The term ‘poor conditions’ refers e.g. to missing hardware, need to change parts of the instruments, significant deviations related to the reference instruments, etc.

For the WCCAP, the states of the systems before and after the calibration and intercomparison workshops sorted by instrument types are shown in Table 2. Altogether, for TNA, 87% of the instruments at the WCCAP passed the final calibration and intercomparison tests and met the requirements of ACTRIS and GAW. Only 13% did not pass these requirements.

Related to the national facilities, 99% of the applicants passed the final calibration and intercomparison tests and met the requirements of ACTRIS and GAW. Only 1% failed.

Table 2: overview of pre-status and final-status of the systems related to the single instrument types

	Pre-status				Final status			
	Good conditions [%]		Poor conditions [%]		Passed [%]		Failed [%]	
	TNA	National	TNA	National	TNA	National	TNA	national
Absorption Photometer	79	100	21		84		16	
Condensation Particle Counter	76	93	24	7	91	98	9	2
Mobility Particle Size Spectrometer	38	77	62	23	92	100	8	0
Integrating Nephelometer	40	100	60	50	80	100	20	0
Extinction Monitor	100	/	/	/	67	/	33	/
CCNC	25	100	75	/	50	100	50	/
On-Site Intercomparison	100	57	/	43	100	100	0	0

Related to TNA, 67% of the instruments at ACMCC showed ‘good conditions’ within the pre-tests at the beginning of the workshops. Only 33% showed larger deviations. After the calibration and intercomparison 83% of all instruments passed the requirements and only 17% failed.

The instruments of the national applicants were in good conditions at the beginning of the workshop. They also passed the requirements.

For the round-robin tests steered by ERLAP, OC&EC analyzers access the calibration facility remotely only, therefore the shape of the instruments can not be assessed. More details about the participants’ performance can be provided if the results obtained for each round robin test are discussed separately.

For more information about the instruments, which already took part in the calibration and intercomparison workshops, have a look at the individual reports of the ECAC. These reports can be found under <http://www.actris-ecac.eu/reports.html>.