GRIMM Aerosol Technik
Newsletter

August 2013

The Grimm EDM 180 Field test kit

The need for a portable and quick field check of our Environmental Dust Monitor model EDM 180 has come to our attention and we developed and constructed such a mobile system mainly for the operation in measurement containers of our European and US-EPA approved EDM-180. This allows any qualified technician to evaluate our continuous automatic fine dust monitoring systems if they work in accordance to existing standards required by law and all this with the low maintenance and no consumable operating costs.

Introduction

To evaluate our well-engineered "All-In-One system EDM 180" to check if it satisfies customers worldwide with its high flexibility and precision of the measurements, many of our worldwide networks have to prove that the long time stability of the instrument is to specifications whenever needed. Therefore we offer two tools for the job in the field,

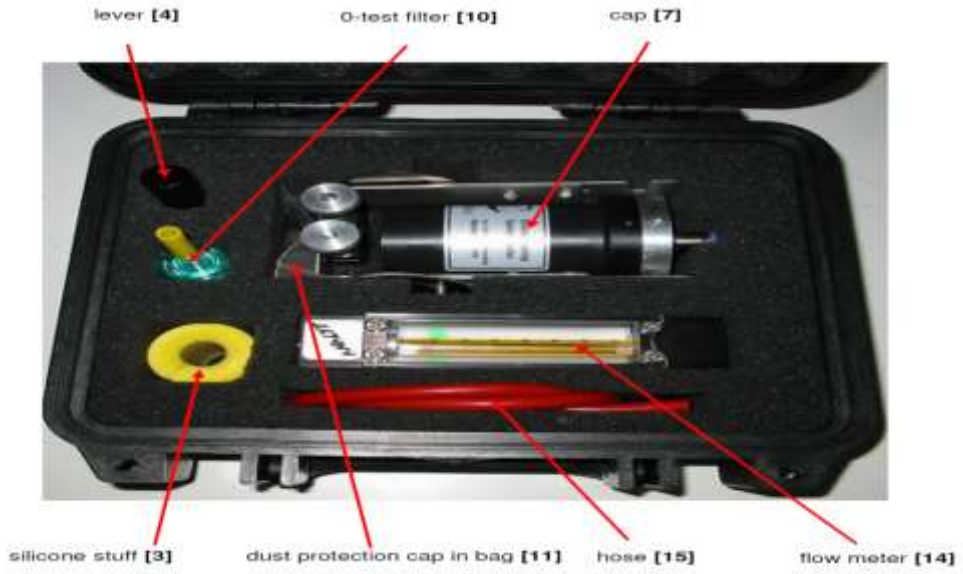

Figure 1: Grimm EDM 180 efficiency test kit

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The 186 **System Performance Tester (SPT)**

Here the user can check if the (a) sample flow is o specification and (b) the optic is clean and fully effective and (c) the air flow system is tight. This is the tool cat.-Nr: 186 and the little case is shown above.

The 188 **Count Validation Tester (CVT)**

The 2nd test kit is recommended in addition for the system test to check the proper size classification for the mass calculation. This tool allows regular size validation in the field, the prototype is shown below.

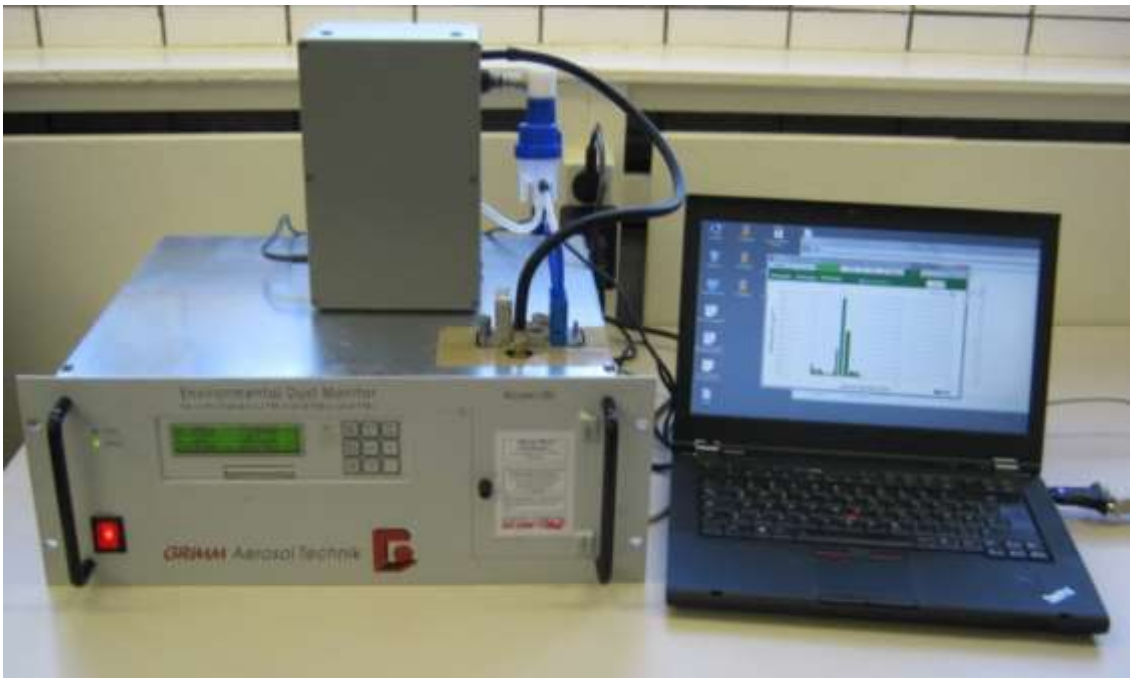

Figure 2: Grimm EDM 180 with field test kit in operation.

Working principle

The Grimm field test kit is based on the generation of a monodisperse aerosol with NIST certified polystyrene latex particles (PSL). The PSL particles are provided in an aqueous suspension which is diluted 1:400 for the use in the test kit.

The diluted suspension is nebulized with an atomizer and subsequently the aerosol is diluted with particle free, dry air. The field test kit is equipped with a precipitator for particle agglomerates in order to narrow the particle size distribution.

Results

A typical particle size distribution with 1 µm PSL particles is shown. A clearly distinguishable peak is observed at a particle diameter of 1 µm, indicating, that the instrument is calibrated correctly. At small particle diameters stabilizers from the PSL suspension as well as residues from the water can be observed. These contributions can be neglected and do not influence the validation. Now the raw spectra obtained from the validation measurement are interpreted by the Grimm validation software, which corrects for contributions from residues and stabilizers as well as agglomerates (see figure 3).

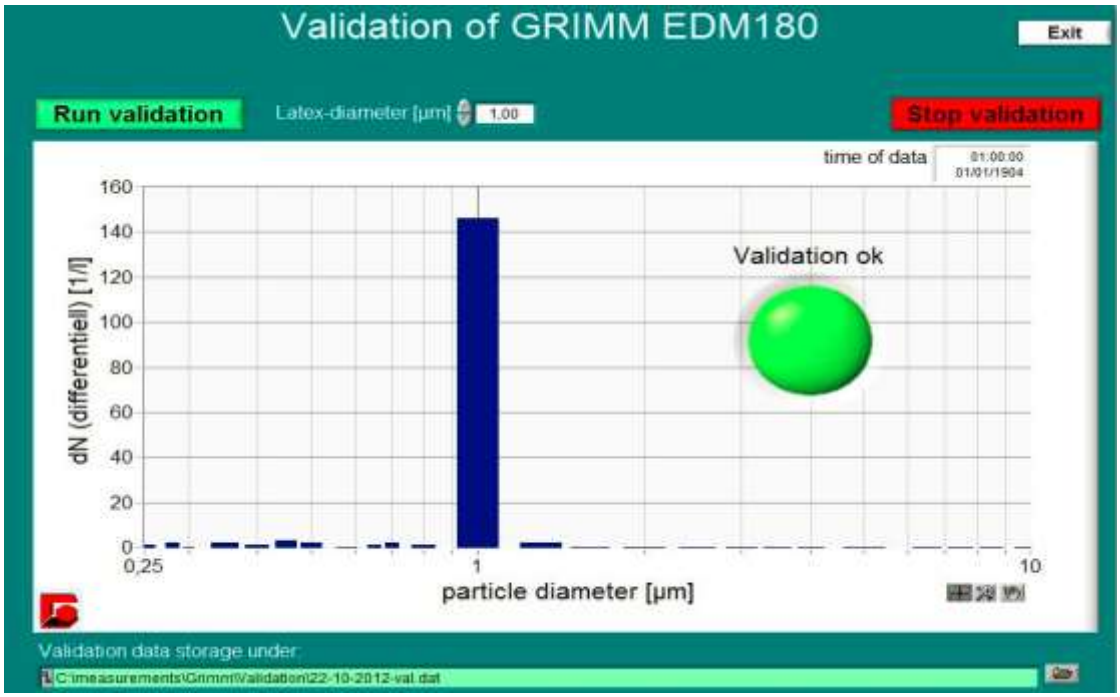

Figure 3:

Grimm validation software showing a successful validation measurement with the EDM 180 field test kit.

end