

US Patent 8,020,726

SD# 10507

Technology Readiness Level: 9

Technology proven through successful operation

Sandia's Powder Dispersion System outputs up to 60 grams per syringe and achieves dispersion rates of at least 170 mg per minute

Research and development settings sometimes require large-scale powder dispersion for experimental purposes. The best existing commercially available aerosol powder dispersion devices are small-scale powder disperser, fluidized bed aerosol generator, and powder inhaler. However, these devices generate very low powder concentration rates, with the aerosol generator producing at most 3-30 mg per minute. One commercially available dust aerosol generator model can achieve higher mass concentrations; however, it does not provide a portable container or the enhanced dispersal options provided by Sandia's solution.

Sandia researchers have developed a method and apparatus for dispersing powder material as small as one micron at a rate of 170 mg per minute. Sandia's Powder Dispersion System can employ an air eductor, which can subject particles to high shear to break apart agglomerates. It can be housed in a case with wheels for portability. The housing can also keep the unit and contents clean in a controlled environment while directing the particulate flow away from the ground. The three important features of the design are: the use of a syringe pump to move the powder to the inlet of the air eductor at a controlled rate; the configuration of the eductor inlet in the mouth of the powder-containing cylinder; and the use of a fan to provide dilution, mixing, and air flow to produce an aerosol at acceptable concentration levels while generating high powder throughput.

This unique powder dispersion system outputs up to 60 grams per syringe at a user defined rate up to 170 mg per minute. The fan provides enhanced dispersal and the case provides optimum flow direction and portability. Sandia's Powder Dispersion System economically achieves dispersion rates of at least 170 mg per minute.



Sandia's Powder Dispersion System

TECHNICAL BENEFITS

- Advanced control of powder dispersion
- Disperses high concentrations (up to 60 grams per syringe) of very fine (1 micron) powders at a rate of 170 mg per minute
- Portable, wheeled case design
- Air eductor breaks down agglomerates

INDUSTRIES & APPLICATIONS

- Automotive and Transportation
- Aerosol Research
- Filter Testing
- Pharmaceutical
- Public safety