

## Collison Nebulizer (Aerosol Generator)

# X-Collison



There are many aerosol generators in the market and TCR TECORA<sup>®</sup> decided to develop a stable, constant and reliable polydisperse aerosol generator suitable for many applications.









X-Collison can generate aerosol from DOP, olive oil, polystyrene latex spheres or solid particles.

The key of our system is a double chamber where is possible to generate up to  $10^7$  particles/cm<sup>3</sup> on line 1 and on the second line the same of  $10^7$  particles/cm<sup>3</sup>.

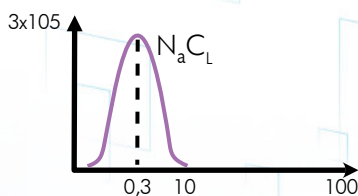
X-Collison generates sub-micrometer aerosol and can atomize solutions or suspension.

Therefore, one of the main advantages compare to the other's aerosol generator it is a double collision Jet with different size range wide the same aerosol out put.

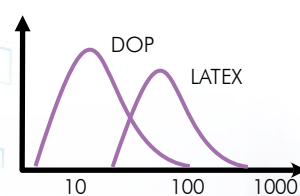
### APPLICATIONS

- |   |  |
|---|--|
|  Filter testing Efficiency       |  Research & Medical             |
|  Material synthesis              |  Test with Polydisperse aerosol |
|  Biological and medical research |  High concentration             |
|  Instrument calibration          |  Double median curve test       |

Size Distribution Line 1



Size Distribution Line 2



- ☒ DOP, Olive Oil
- ☒ PSL, Latex Spheres
- ☒ Solution for Solid Particles





*Experts in  
Aerosol Generation*

## How it works?

Pressure air is applied on the pressure IN port then air expands through an orifice to form a high-velocity jet.

Orifice can be changed according to the number median diameter of the droplets required.

Droplets with large diameter impact to an internal wall and fall down back in the solution, therefore excess liquid is drained at the bottom parts of the atomizer. The mean particle size of the generated aerosol can be regulated in a range 0.02 - 0.3 micrometer by atomizing a solution and evaporating the solvent.

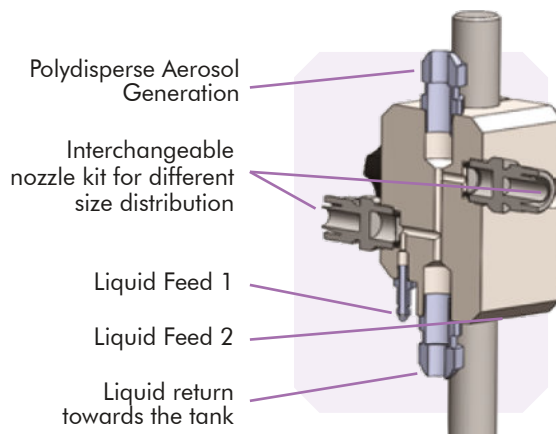
With DOP the system is working in a range from 0,03 to 1,3  $\mu\text{m}$ .

The maximum PSL size is 2  $\mu\text{m}$ .

Concerning the liquid consumption (water), the single version mode the rate is about 0,1 ml/min, in double version mode is 0,2 ml/min.

With a pressure of 2,5 Bar, the system is able to generate an air flow rate of about 3,5 l/min. Liquid flow rate is about 20,5 ml/min at 2,5 Bar.

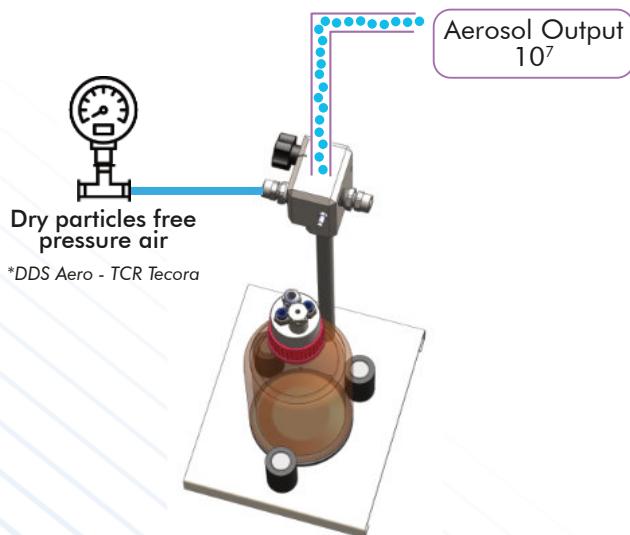
With the syringe pump it is possible to change liquid flow rate down to 0,61 ml/min (less with different air pressure rate).



### Configuration **Single Line**

up to  $10^7$  particles/cm<sup>3</sup>

≈ Ambient Pressure



Dry particles free  
pressure air

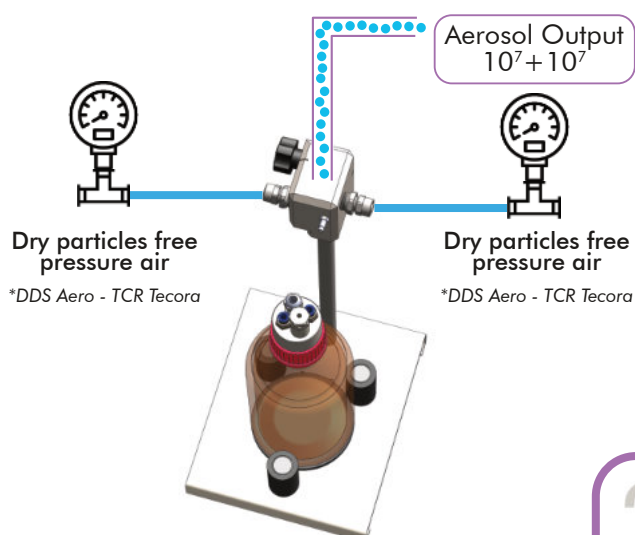
\*DDS Aero - TCR Tecora

Recirculating Mode

### Configuration **Double Line**

up to  $10^7 + 10^7$  particles/cm<sup>3</sup>

≈ Ambient Pressure



Dry particles free  
pressure air

\*DDS Aero - TCR Tecora

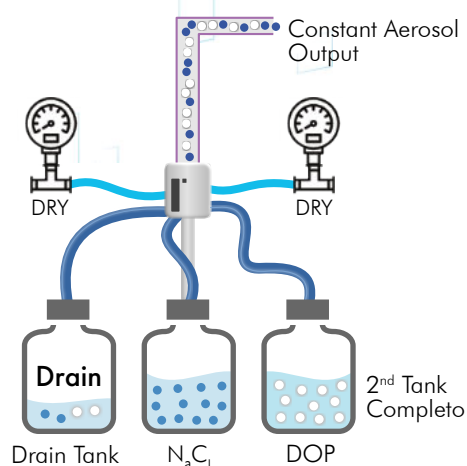
Dry particles free  
pressure air

\*DDS Aero - TCR Tecora

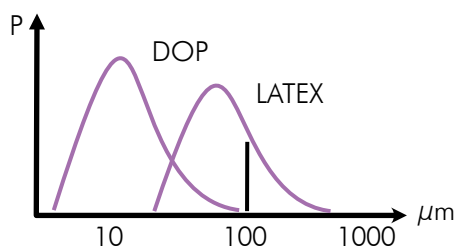
Recirculating Mode



### Configuration Double Line with different Particles non Recirculating Mode



Drain tank and connectors	AC99-121-0007SP
2° tank	AC99-121-0008SP

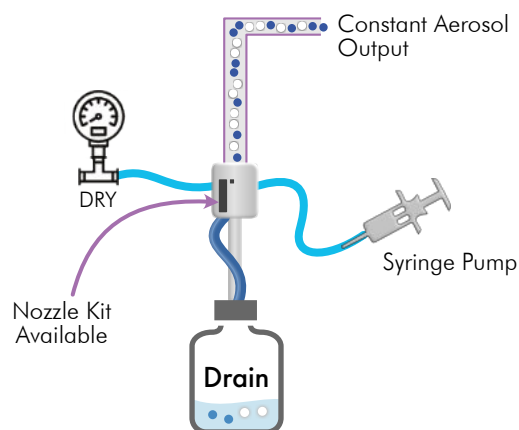


The double configuration mode of **X-Collison** allows generating an aerosol with high concentration and if used different solutions, a mixture of aerosol can be homogeneous generated in order to do research with combination of aerosol drug and bacteria directly in the aerosol.

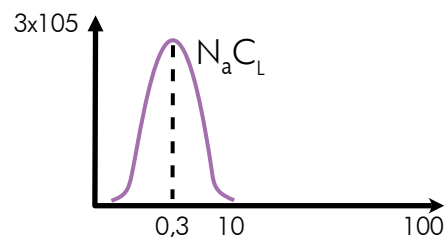
#### Applications:

- ☑ In vitro Aerosol test;
- ☑ Aerosol combination of different bacterias;
- ☑ Medical Research and Toxicity test.

### Configuration Double Line Non Recirculating Mode



Syringe Pump Automatic	AC99-121-0009SP
Nozzle Kit Variable	AC99-121-0010SP



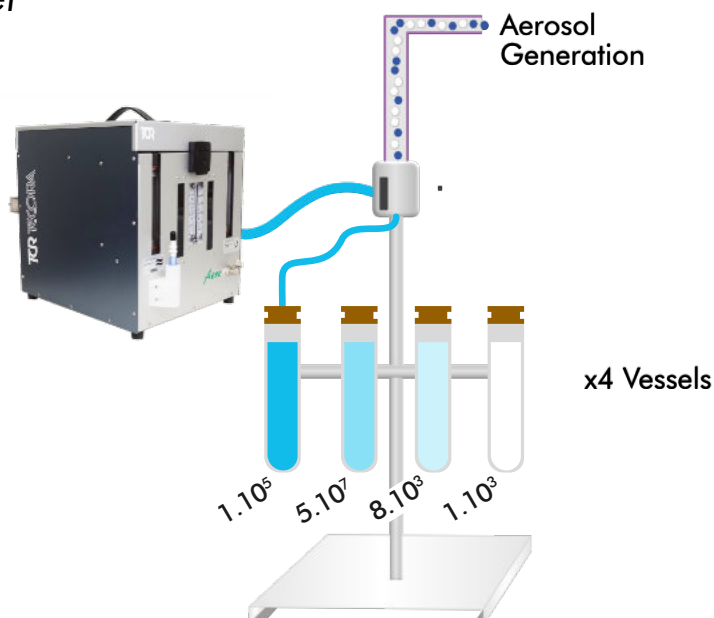
**X-Collison** can easily work with a syringe pump that provides an affordable solution of dispensing a flow control applications. Syringe pump can be controlled in automatic mode by a computer. The residual into the syringe, it is not changing aerosol distribution over too low capillary dimensions.



### Small Quantity Preparation Vessel

In this configuration can be combined different solution with a complete control of small quantity generation.

With the help of vessel holder it is possible to generate aerosol with different concentration from the same other solution.



CODE	AC99-121-0011SP
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### Zero Air Generator

It is recommended to use of dry particles free zero air at the inlet port of X-Collision TCR Tecora<sup>®</sup> developed an automatic pressure air generator with integrated HEPA Filter and Dryer, DDS Aero. It is possible to control flow and pressure to power X-Collision.

A passive generator it is the best solution if available pressure air (oil free).

#### DDS Aero Zero Air Generator



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#### Basic Aero Drying / Cleaning System



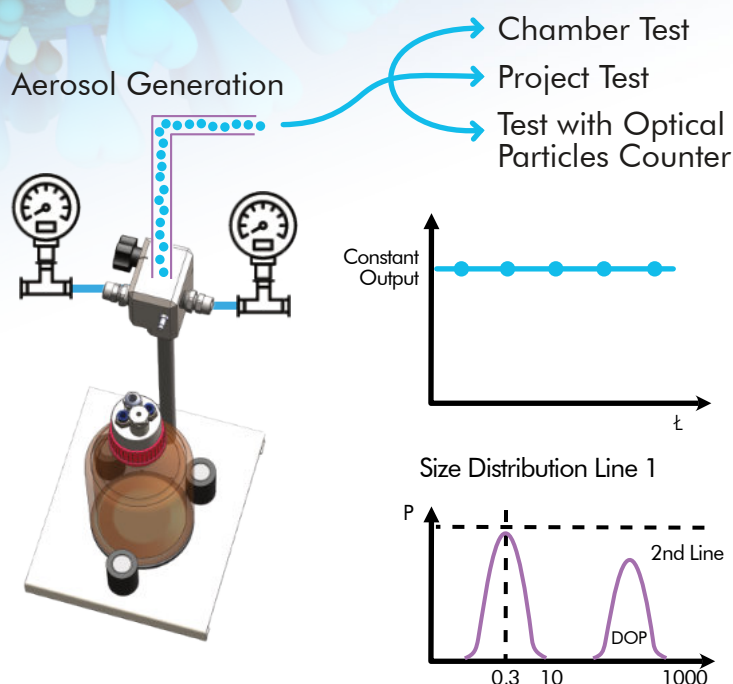
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# TCRTECORA<sup>®</sup>

## POLLUTION CHECK



CODE AC99-121-0003SP

Select a solute for generating the aerosol. Common solutes for solid particles are sodium chloride, uranine, and methylene sucrose; for oil particles are dioctyl phthalate (DOP) and olive oil. The recommended solvent for solid particles is fresh distilled water; for oil particles, use clean, reagent-grade alcohol.

Usually 0.0001 gram of solute per cubic centimeter of solvent is convenient for most applications; in the case of a liquid, however, use 0.0001 cubic centimeter of solute per cubic centimeter of solvent. Refer to Chapter 5 for information on the relationship between particle size and solute concentration

### Note:

Using solvent for solid particles concentration into the tank may be change during elapsed time - due to solvent evaporation (in recirculation mode).

## TECHNICAL SPECIFICATIONS

X-Collision Nebulizer (Aerosol Generator)	X-Collision-3	X-Collision-1	X-Collision-15
Tank volume (other sizes on request)	1,1 L	0,5 L	0,25 L
Flowrate (indicative max with dilution system)	1 ÷ 10* l/min	1 ÷ 10* l/min	1 ÷ 10* l/min
Particles / Volume	> 10 <sup>7</sup> particles/cm <sup>3</sup>	> 10 <sup>7</sup> particles/cm <sup>3</sup>	> 10 <sup>7</sup> particles/cm <sup>3</sup>
Chambers Materials	Pyrex Glass	Pyrex Glass	Pyrex Glass
Solution duration (max dispensing) Recirculation Mode	> 10 h	> 5 h	> 2 h
Nozzle pressure	1,5 ÷ 3 Bar	1,5 ÷ 3 Bar	1,5 ÷ 3 Bar
CODE	AC99-121-0003SP	AC99-121-0013SP	AC99-121-0014SP

Zero Air Generators	DDS Aero	BASIC Aero
Dimensions (mm)	250 x 250 x 260 mm (b x p x h)	300 x 250 x 250 mm (b x p x h)
Weight KG	6 Kg	5 Kg
Main power supply	220 / 240 Volt 50 ÷ 60 Hz	1 ÷ 3 Bar
Secondary power supply (option)	Internal Battery 12 Vdc	—
Zero Air flow	0.4 ÷ 20 l/min	0.4 ÷ 20 l/min
Nozzle pressure	0.1 ÷ 3 Bar	1 ÷ 3 Bar
CODE	AC99-120-0000SP	AC99-121-0012SP

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