



Portable breath regulated nebuliser

Effective nebulisation is all about:

- High lung deposition
- Ease of use
- Patient acceptance
- Minimising wastage

Based on the ultrasonic technique the Nequilizer is:

- Portable - handheld, rechargeable
- Intelligent - only operates when horse breathes
- Rapid - delivers 5 ml of medication in 15-20 breaths or 4-5 minutes
- Direct - no tubing or large mask for aerosol to be deposited on
- Acceptable – low resistance, quiet operation..... will not alarm horses
- Optimised – small median particle size (2.8um) with 90% of particles <5.5um
- Versatile – can be used with any water based solution
- User-friendly – light weight, ergonomic handle
- Visible – clear plastic chamber with indicator to confirm correct operation



NEQUILIZER 

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MEQUIVET



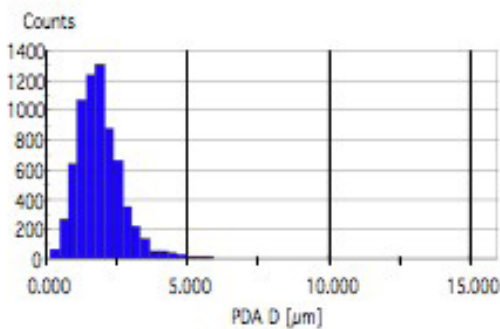


Laboratory Performance of the Nequilizer

Particle size analysis was undertaken using Dantec Dynamics laser based system for Particle Characterisation and Particle Dynamics Analysis (PDA). The Particle Dynamics Analysis (PDA) system measures on-line the size, velocity and concentration of spherical particles, droplets or bubbles suspended in gaseous or liquid flows. The common application of the equipment is in the analysis of atomised liquids (sprays), for example in fuel injection, spray painting, liquid metal spraying and pharmaceutical sprays.

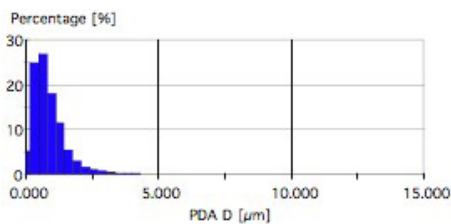
Simulation: Front valve removed, Medium nebulisation rate (5 min. for 5 ml medicine), Chamber emptied every 6 seconds simulating a breathing rate of 10 breaths/minute. The laser sampling area is ~5 cm in front of the mask. The data shows that the excellent droplet sizes are the result of the optimised design of the Nequilizer and is relatively insensitive to external parameters.

Performance of the Nequilizer using tapped water



Dv0.1 [µm]	Dv0.5 [µm]	Dv0.9 [µm]
1,79	2,78	5,52

Performance of the Nequilizer using a mixture of Atrovent/Ipratropium bromide (0,25 mg/ml)



Dv0.1 [µm]	Dv0.5 [µm]	Dv0.9 [µm]
1,21	3,28	10,06

In vivo evaluation of pulmonary distribution using the Nequilizer

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Three healthy adult horses were used for the radioisotope deposition studies.

The horses were sedated with intravenous detomidine immediately prior to nebulisation and imaging.

⁹⁹Tc-diaminetriaminopentaacetic acid (^{99m}Tc-DTPA) diluted in saline was loaded into the Nequilizer.

The solution was nebulised for 5 min while the nebuliser and scavenging system were connected to the horse.

Images were obtained using a large field of view gamma camera fitted with a low-energy general-purpose collimator linked to a dedicated nuclear medicine computer (dynamic acquisition, 128 x 128 matrix acquiring 60 x 2 second frames).

Acquisition of the first image was within 5 min of nebulisation to limit uptake of ^{99m}Tc-DTPA into the pulmonary circulation or movement away from the site of deposition.

The pattern of distribution of the aerosol in the lung was very good, with a deposition pattern confirming good peripheral distribution of the aerosol generated by the Nequilizer, consistent with the in vitro particle size validation studies.

Pulmonary deposition of ^{99m}Tc-DTPA in an adult horse following nebulisation of saline using the Nequilizer.

