

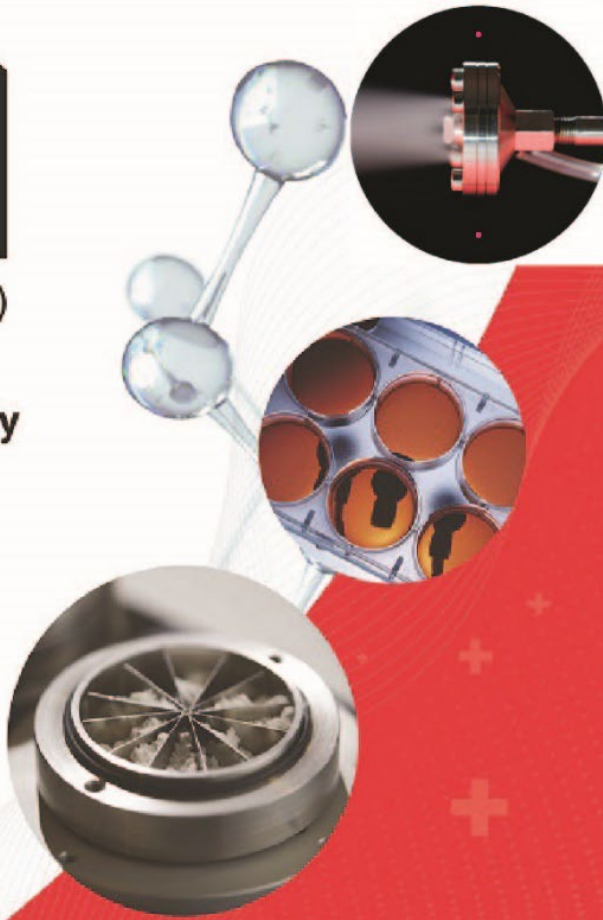
 **Inhalation Toxicology**

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## Academic Research - Case Study AR 2

**Development of an Atomizing Platform for 3 Separately Metered Immiscible Fluids**

**Because We Could!**

**Development of an Atomizing Platform for 3 Separately Metered  
Immiscible Fluids Plus Air**  
***Because We Could!***

**Problem Statement**

A CH Technologies (USA) solution that had to wait for a problem!

Having developed the Blaustein Atomizing Module (BLAM) to obtain higher generation efficiency, particularly at low airflows, than platforms such as the Collison Nebulizer, we concluded that separate delivery of immiscible or reactive fluids might be of research interest.

At the time of development, no enquiries had been received to drive the production of the new platform.

**Available Nebulizer Platforms**

Available atomizing nozzles were either recirculating (from a reservoir), syringe fed with a single fluid, or employed a combination of these feed types. Immiscible fluids could only be nebulized if emulsified formulations could be developed, and reactive fluids could only be generated using multiple individual atomizers.

CHT was already the producer of a variety of atomizer platforms including the 1, 4 and 8-jet BLAM and older 1, 3, 6 and 24-Jet Collison nebulizers but recognized the challenges of cogeneration of immiscible or reactive fluids.

CHT also accepted that the viability of microorganisms and virus particles could be reduced by the high velocity impact and desiccation associated with nebulization through a Collison platform and that alternative platforms were necessary.



**Standard BLAM with  
single fluid feed**

**CH Technologies Solution**

To overcome the perceived limitations of standard platforms, CHT concluded that an alternative version of the BLAM nozzle was needed that would deliver up to 3 fluids to the single point of atomization.

Mixing of the fluids would occur dynamically in the fluid inlet manifold, and through the jets due to the flow and expansion of the compressed gas – typically, but not necessarily air.

Two additional fluid feed lines were designed into the atomizer nozzle module.

The 4 fluid nozzle (including gas flow) added two liquid feed ports to the proven BLAM atomizer nozzle.



**BLAM 4 Jet – Close Up**

### **New Platform Flexibility?**

The new platform can be supplied with standard or low carrier gas flow making it suitable for a wide range of applications and concentrations. Different expansion plates are available for generating less vacuum on the liquid feed ports for higher precision of the test article delivery feed rate similar to the standard single jet model.



**BLAM – 4 Fluid Feed from 3 Individual Syringe Pumps**

## **Research Outcome**

In practice it turned out that the aerosol generation challenges that can be solved by the BLAM 4-Fluid platform did already exist, and in multiple fields of research! As a consequence, since its introduction into the CH Technologies (USA) catalogue of products the 4-Fluid BLAM has been sourced by Universities, Government Agencies and a broad range of businesses.



For more information visit <https://chtechusa.com>

or contact us at: [sales@chtechusa.com](mailto:sales@chtechusa.com)

Westwood, NJ 07675, USA

Office Phone: +1 (201) 666-2335