

YOUR EXPERTS FOR BURNERS AND COMBUSTORS



One of a kind:

CS'S NEW ULTRASONIC NOZZLE JULIP REDUCES CONSUMPTION OF ATOMIZING AIR BY HALF

Upon multiple requests by its clients, CS Combustion Solutions has invented a unique ultrasonic nozzle that combines all the advantages of typical jet-type nozzles with a drastically reduced air demand of approximately 50%. JULIP opens up large potentials for minimizing operating costs as well as substantially enhancing the performance of thermal oxidizers and sulphuric acid production plants.

Market trends indicate that in the future, demands on the capacity of thermal oxidizers and the throughput of low calorific waste feeds will continue to grow particularly for sulphuric acid production plants.

Subsequently, the number of ultrasonic nozzles employed for these applications will rise and result in increased requirements of atomizing air. In many cases, however, a limited compressed air supply and the need to avoid an escalation of operating costs are very likely to act as constraining factors.

As an expert drawing on 30 years of experience in equipping combustors and thermal oxidizers with ultrasonic jet-type nozzles, CS has been asked by its clients to help solve this dilemma and investigate possibilities to boost plant capacity without increasing atomizing air consumption. Since ultrasonic atomizing still sets the benchmark for such applications, CS took on the challenge of refining this technology.

Major advantages of typical jet-type appliances include long-term operation without plugging, suitability for highly viscous and polluted liquids, a turn down of up to 1:10, an extended life span due to very low speed and pressure of the liquid feed, and a fine and homogeneous droplet distribution. Our objective was to develop a nozzle that retains all these benefits while simultaneously allowing a reduction of atomizer consumption and an indirectly lower OPEX respectively.

After different approaches and tests, CS has created a completely new generation of ultrasonic atomizing nozzles.

Due to a novel geometry, all of JULIP's parameters for atomizing quality (droplet size and droplet distribution) are better than those of customary appliances. The air demand is even reduced to approximately 50% of the traditional jet-type nozzle: conventional ultrasonic atomizers require approximately 20–30% of compressed air (Nm^3/hr) related to liquid throughput (l/hr), whereas JULIP runs with only 15–20% and exhibits a better spray pattern as well. Overall, this allows yearly cost savings of up to 50% (see table below for details).

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Particularly thermal oxidizers with several lances for injection of low calorific liquids and sulphur burning plants are going to profit drastically from this reduced energy consumption.

After completing the internal testing and evaluation phase, the new JULIP nozzles are already in operation at some of CS's longterm clients' plants.

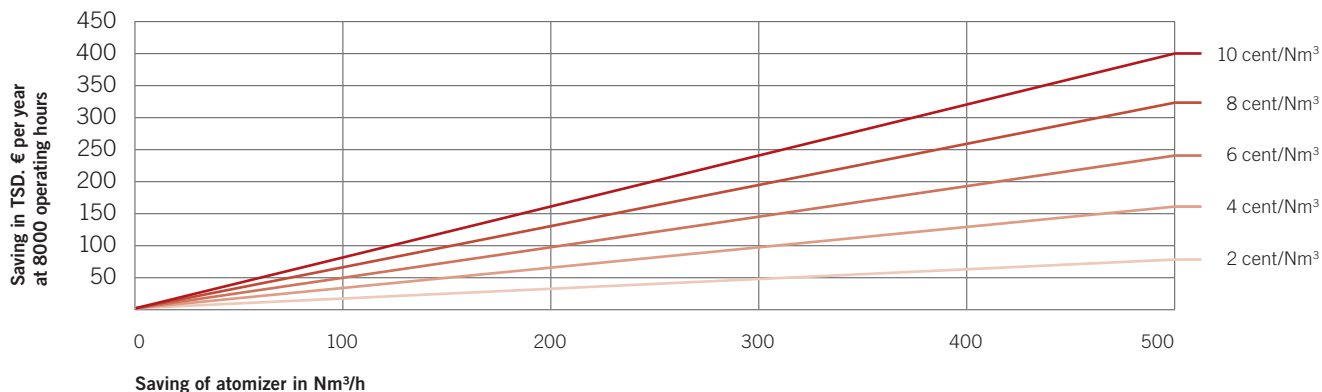
ANNUAL COST SAVINGS UP TO 50 % DUE TO LESS ATOMIZER DEMAND

Case study based on our most used jet nozzle **CS 6/4" I-S**

	conv. Nozzle	JULIP
Liquid medium	1700 kg/h at a density of 1000 kg/m ³	
Atomizer requirement	460 Nm ³ /h	230 Nm³/h
Droplet size	110 μm	112 μm

At a price for atomizer air of 6 Eurocent/Nm³ this leads to **savings of € 110.400 of operational costs per year**. This calculation is based on **8,000 operating hours per year**. The size of the jet nozzle used for the study is a medium size nozzle.

Savings of atomizer in € per year with JULIP

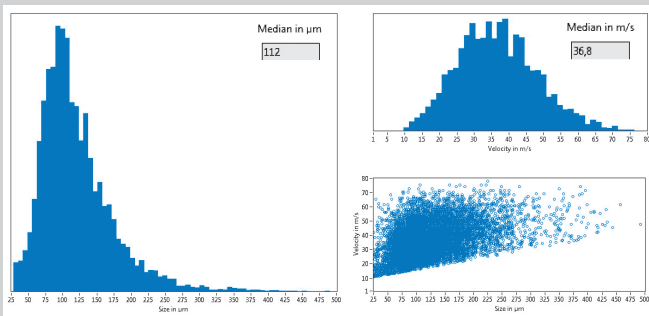


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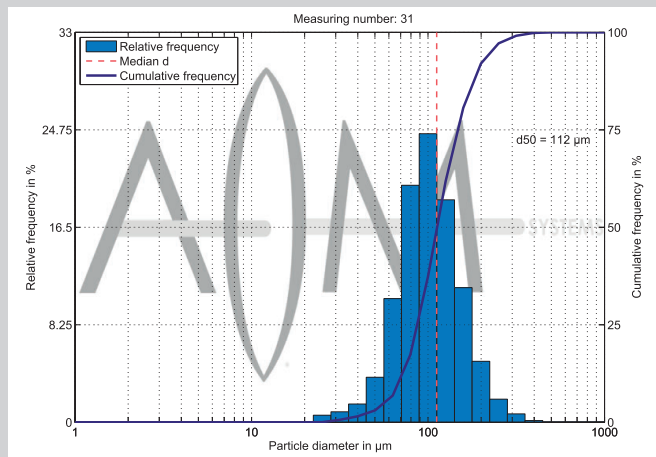


TECHNICAL DATA OF THE NEW ULTRASONIC JULIP NOZZLE

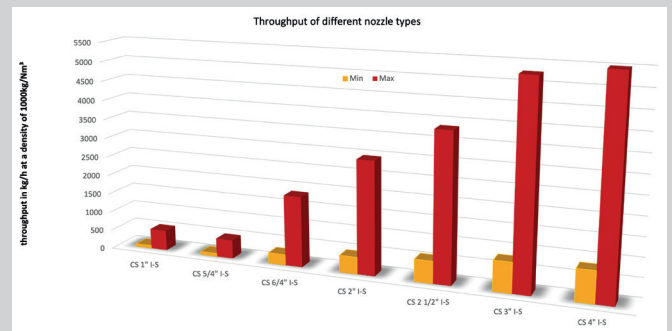
These data were recorded during testing of the new atomizing system. For testing water as liquid media and air as atomizer was used. The tests are based on a load case of 1500 kg/h water and 220 Nm³/h atomizer air. See below the droplet size, speed of droplets and the distribution of those:



Cumulative percentage and relative frequency of droplet size



CS JULIP nozzles available on the market



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August 2021

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