Introduction

The standard conditions under which a pressure atomiser is tested, such as supply pressure and oil viscosity, may be different for different types of atomizers. Every single atomiser is tested under these specific conditions before leaving our factory. The output and spray angle, given on the head of each atomizer, only is valid under these standard conditions.

The data provided for disc type pressure atomisers also applies only under specific standard conditions as shown on the corresponding data sheets.

Conversion formula

Very often an atomiser or disc combination will not be operated under standard conditions, but at a different supply pressure and with a fluid of different viscosity. The following formula will enable you to determine the actual output of any pressure atomiser or disc combination under non-standard conditions:

$$\Phi_{m,o} = \Phi_{m,s} \cdot \left(1 + \frac{\upsilon_o - \upsilon_s}{100}\right) \cdot \sqrt{\frac{P_o}{P_s}}$$

where:	$\Phi_{m,o}$	=	output massflow under operating conditions	[kg/h]
	$\Phi_{m,s}$	=	output massflow under standard conditions	[kg/h]
	ν_o	=	kinematic viscosity under operating conditions	[mm²/s] or [cSt]
	ν_s	=	kinematic viscosity under standard conditions	[mm²/s] or [cSt]
	P_o	=	supply pressure under operating conditions	[bar]
	P_s	=	supply pressure under standard conditions	[bar]

Example

According to information sheet 12-E1GM-4G-E, an atomiser W2-160-50° would have an output mass flow of 160 kg/h at a supply pressure of 25 bar, using a fluid with a viscosity of 5 mm²/s and keeping the return line fully closed.

This W2-160-50° will be operated at a supply pressure of 30 bar, using a fluid with a viscosity of 12 mm²/s. What will be the output mass flow with closed return line under these conditions?

Substitution in the above mentioned formula provides the answer:

$$\Phi_{m,o} = 160 \cdot \left(1 + \frac{12 - 5}{100}\right) \cdot \sqrt{\frac{30}{25}} = 187{,}5 \text{ kg/h}$$

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