

North American Tip Emulsion Atomizers for #2 to #6 (light to heavy) Oils

Sheet 5643-1

Ref: Sheets 5643-3 & 4



5643 Tip Emulsion Atomizers provide atomization and flame patterns superior to those produced by conventional full emulsion atomizers, while requiring only about 25% of the steam or compressed air per gallon of oil. 5643 Atomizers provide better stability, and permit clean operation under cold conditions when used in North American series 6795, 6820 or similar types of burners. Maximum fuel oil viscosity at the burner is 100 SSU.

Table 1. 5643 Atomizer Capacities and Consumption Rates

Atomizer designation	Maximum Capacity		Indicator number	Atomizing steam rate (no oil flowing)	
	in US gal/hr of oil	litres/hr		lb steam/hr at 80 psi	kg steam/hr at 5.6 kg/cm
5643-01	40	150	42	40	18.1
5643-0	100	380	165	140	64
5643-1	200	760	824	225	102
5643-3	400	1520	2400	660	299

Minimum oil rates are not shown since turndown is dependent on the burner in which the atomizer is used. Use the following method to determine atomizing steam rate at any oil flow rate (within the limits shown above) and at a given atomizing steam pressure (not exceeding 90 psi). Because the "Indicator Number" used is an empirical figure based on US units, calculations must be made in US units, and the answer converted to the metric equivalent if desired. Multiply by $\frac{1}{3}$ to convert from lb steam/hr at 80 psi to approximate scfm atomizing air at 80 psi.

Method For Determining Atomizing Steam Rate: Select the atomizer whose maximum capacity least exceeds your desired oil flow rate. Find the Oil Ratio by dividing your desired oil flow rate in gph by the Indicator Number (Table 1) of the atomizer selected

$$\left(\text{Oil Ratio} = \frac{\text{desired oil flow rate, gph}}{\text{Indicator Number}} \right)$$

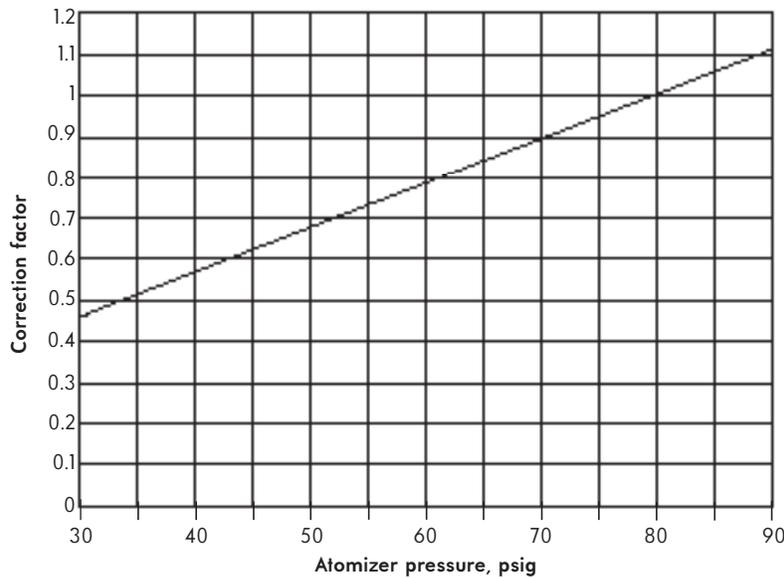
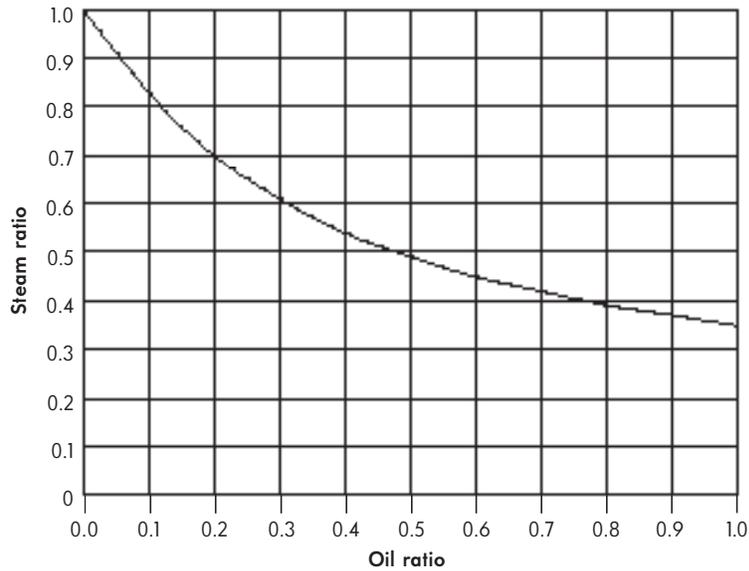
From Figure 1 on page 2, find the Steam Ratio that corresponds to the Oil Ratio just determined. Multiply the Steam Ratio times the atomizer's steam rate (Table 1) with no oil flowing to give the atomizing steam rate in lb/hr at 80 psi for the job.

To find the steam rate at pressures other than 80 psi, multiply the answer by the Correction Factor found in Figure 2 for the desired steam pressure. If using compressed air, first find the steam rate in lb/hr at 80 psi (Table 1) and convert to scfm of air at 80 psi by multiplying by $\frac{1}{3}$. Figure 2 is used to correct for differing air pressures in the same manner as for differing steam pressures. To convert answers to metric, multiply—

lb/hr by 0.4536 for kg/hr
 scfm by 1.698 for m^3/hr
 psi by 0.070 for kg/cm^2
 gph by 3.785 for litres/hr

Example: Select an atomizer for 221 gph and determine atomizing steam consumption at 70 psi.

Solution: Choose a 5643-3 Atomizer. Oil Ratio will be $221/2400 = 0.09$. From Figure 1, Steam Ratio will be 0.83. Multiplying 0.83 times 660 gives about 550 lb/hr atomizing steam consumed at 80 psi. For 70 psi steam pressure, Figure 2 shows a correction factor of 0.9, which times 550 gives a steam consumption of 495 lb/hr at 70 psi. If compressed air is used, 550 times $\frac{1}{3}$ gives 183 scfm atomizing air at 80 psi. For 70 psi multiply by 0.9 to get 165 scfm. (Multiplying 495 by $\frac{1}{3}$ also gives 165 scfm.)



WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and insurance Underwriters recommendations, and care in operation.

Figure 2. Correction Factors for atomizing medium if at a pressure other than 80 psig.



CONTACT US:
 Fives North American Combustion, Inc.
 4455 East 71st Street - Cleveland, OH 44105 - USA
 Tel: +1 216 271 6000 - Fax: +1 216 373 4237
 Email: fna.sales@fivesgroup.com

www.fivesgroup.com