

Metal Working Fluid Safety 165

The concentrate for semi-synthetic metal working fluids (MWFs) contains from 5 – 30 % severely refined lubricant-based oil, 30 – 50% water, with the remainder being other materials such as additives, emulsifiers, etc.

To work with percents such as these, the three parts of a percent problem should be identified so the known values can be substituted into the general percent formula.

$$\text{Amount} = \text{Rate} \times \text{Base}$$

$$A = R \times B$$

The base (B) is the whole or original amount the problem is based on. For this type of problem, the base would be the size of the container holding the concentrate.

The rate (R) is part of the base in percent form. The rate would be the 5 – 30% lubricant-based oil or the 30 – 50% water, depending upon what part is wanted. These percents would need to be changed to decimal values before any calculations are made.

The amount (A) is the numerical part of the base that the rate also represents. If using the percent of water in the concentrate in the percent formula, the amount found would be the amount of water in the concentrate.

EXERCISES:

1. If a 30 gallon drum of semi-synthetic MWF concentrate has 25% lubricant-based oil and 40% water, determine each of the following amounts.
 - a. Number of gallons of lubricant-based oil in the drum of concentrate.
 - b. Number of gallons of water in the drum of concentrate.
 - c. Percent of other materials in the concentrate.
 - d. Number of gallons of other materials in the drum of concentrate.

2. A 50 gallon barrel of semi-synthetic MWF concentrate contains 30% severely refined lubricant-based oil and 25% other materials like additives, etc.
 - a. Determine what percent of the concentrate is water.
 - b. How many gallons of water are contained in the 50 gallon barrel of concentrate?



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