

## Technical Information:

**Date:** March 2006  
**Subject:** Water Treatment - Degree Baume Scale  
**Topic :** The Term Degree Baume

Also referred to as Baumé °Bé, °B, degrees Baumé, Baume, Baumé scale.

Periodically we get calls with someone wanting to know what they should use with a chemical and give reference to a Degree Baume. E.g. 66° Baume Sulphuric Acid ? If asked most people would have no idea what this refers to.

What does °Baume mean with regards to chemical and concentration ?

The °Baume scale is an old antiquated method of measurement of a chemicals Specific Gravity. It was devised a long time ago and is a scaling on a hydrometer which measures the Specific Gravity of solutions.

To really make things confusing there are 2 ways of using this scale, one for liquids that are more dense than water and one for liquids less dense than water.

Liquids with lower S.G. than water,  $S.G = 140 / (°Bé + 130)$

Liquids with higher S.G. than water  $S.G = 145 / (145 - °Bé)$

So, if you have the °Baume of a known chemical, you could calculate the S.G. From this you can compare the S.G. of the particular chemical and see what the actual % concentration would be.

This does seem cumbersome and normally the charts of % concentration and S.G. are not so readily available.

The following 4 examples are how this conversion would be done, first 3 are for some typical chemicals used with a higher density than water and the fourth has a density less than that of water.

### **Example 1**

66 °Bé Sulphuric Acid. H<sub>2</sub>SO<sub>4</sub>

$$SG = 145 / ( 145 - \text{Bé} ) = 145 / ( 145 - 66 ) = 145 / 79 = 1.835$$

If you look at the data of Sulphuric Acid you will see that a S.G. of 1.835 represents a concentration of approx. 93%

### **Example 2**

20° Bé Sodium Hydroxide NaOH

$$SG = 145 / ( 145 - \text{Bé} ) = 145 / ( 145 - 20 ) = 145 / 125 = 1.16$$

If you look at the data of Sodium Hydroxide you will see that a S.G of 1.16 represents a concentration of approx. 15 %

### **Example 3**

22° Bé Hydrochloric Acid HCl

$$SG = 145 / (145 - \text{Bé} ) = 145 / ( 145 - 22 ) = 145 / 123 = 1.1789$$

If you look at the data of Hydrochloric Acid you will see that a S.G. of 1.1789 represents a concentration of approx. 36%

### **Example 4**

26 °Bé Ammonium Hydroxide NH<sub>4</sub>OH

$$S.G. = 140 / (\text{Bé} + 130 ) = 140 / ( 26 + 130 ) = 140 / 156 = 0.897$$

If you look at the data of Ammonium Hydroxide you will see that a S.G of 0.897 represents a concentration of approx. 29%.