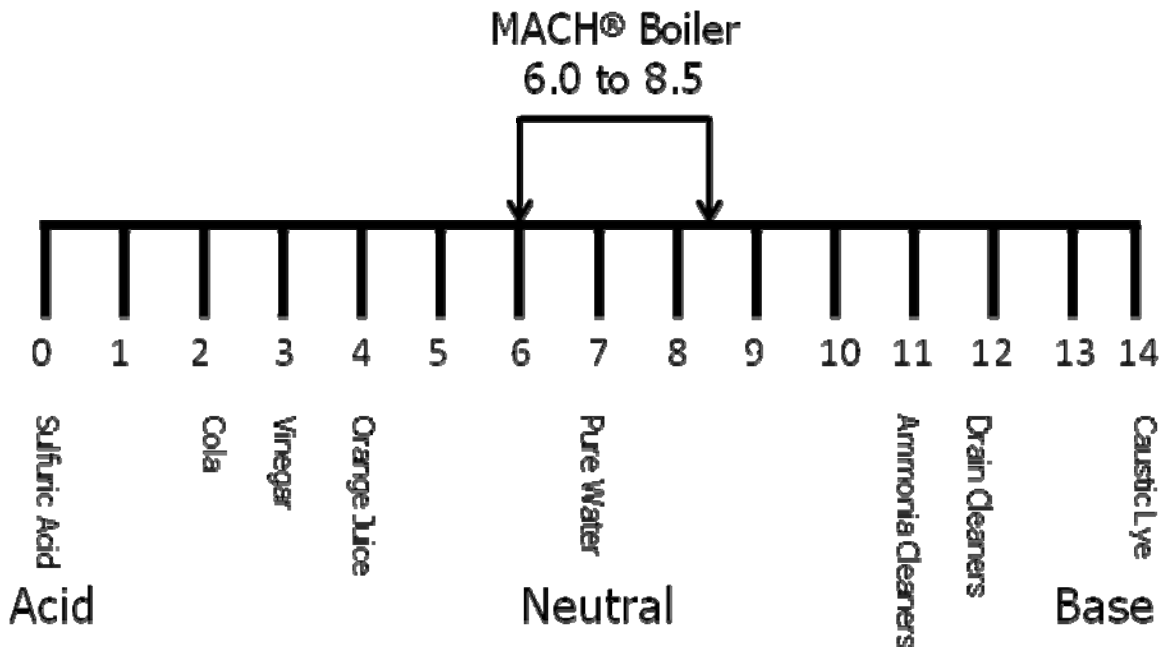


MACH® BOILER – pH Levels

The MACH® boiler utilizes an aluminum heat exchanger that requires a very specific pH range for the hydronic fluid (water – water/glycol). The pH is a measure of the acid content of the water. The MACH® boiler requires that the pH be between 6.0 and 8.5.

The pH Scale ranges from 0 (acid) to 7 (neutral) to 14 (base). The pH scale is logarithmic, meaning that the difference between each pH unit is a factor of **10**.

Example: **a pH of 9.5 is 10 times more alkaline than a pH of 8.5**
a pH of 4 is 10 times more acidic than a pH of 5



A sample of boiler water or boiler water/glycol should be tested. The sample should read between 6.0 and 8.5 to be correct for a MACH® boiler. Samples that read above or below the specification are outside of the allowable operating range and may cause damage to the boiler. It has been found that water with the pH greater than 8.5 can have negative effects on the aluminum and may cause premature boiler failure.

The use of pH paper (or litmus paper) to test the hydronic fluid (water) is highly suspect. This paper degrades with age and is only accurate to +/- 2 pH units. It is not considered acceptable as a test

Bulletin: M-101

Date: 7/20/10

Supersedes: M-101 4/1/05

TECHNICAL DATA

HARSCO
INDUSTRIAL
Patterson-Kelley

method by Harsco Industrial Patterson-Kelley. The best and easiest way to measure pH is to use a pH meter.

The pH of the hydronic fluid (water) should be measured using a pH meter. Harsco Industrial Patterson-Kelley recommends the use of a calibrated pH meter as the best method for measurement. A pH meter is an inexpensive investment that will give readings to +/- 0.1 pH. Acceptable pH meters are available from a variety of companies including Omega at 1-888-826-6342 (PHH-3X-KIT for \$60) or Fisher Scientific at 1-800-766-7000 (PH-testr1-kit for \$85), or www.professionalequipment.com (ExStik PH100 for \$90).

All pH meters need to be calibrated for accurate use. Standard pH solutions or powders are inexpensive (less than \$10) for pH 4, 7, and 10 or included with a kit. It is recommended that the pH meter be calibrated by placing in a solution of pH = 7, and then a solution of pH = 10. Please read the instructions because every meter has a slightly different calibration process, or knobs to adjust.