



AMPERSUL

Description

AMPERSUL (ammonium persulfate or ammonium peroxydisulfate - $(\text{NH}_4)_2\text{S}_2\text{O}_8$) is a strong oxidizing agent, which provides an effective and selective killing effect against bacteria present in liquid yeast. The ability to kill bacteria is greater at low pH. AMPERSUL is normally used in conjunction with acid in "washing" pitching yeast to selectively kill off any contaminating bacteria. The combination of acid and AMPERSUL provides more effective treatment than the use of acid alone. When added to liquid yeast, the AMPERSUL begins to decompose, releasing extremely active oxidizing intermediates such as ozone, which bring about the actual bactericidal action. Within a relatively short time the ammonium persulfate and its intermediate oxidizers completely react with various compounds in the yeast slurry, leaving no residual behind when the yeast is pitched into fresh wort.

Typical Properties

Form	Crystalline powder
Color	White
Aroma	Nearly odorless
Solubility	Freely soluble in water
Assay value	90% or greater

Suggested Procedures For Use

Make up a 10% solution of AMPERSUL in **cold water**. The Ampersul will gradually decompose in water, so the solution should be made immediately before it is to be used.

AMPERSUL should be used in conjunction with a somewhat weak acid during yeast "washing" to provide optimum killing of bacteria with a minimum effect on the yeast. Yeast is washed at a pH of 2.0 to 2.8. The acids commonly used are partially neutralized sulfuric acid (sodium hydrogen sulfate - NaHSO_4) or phosphoric acid. Both of these acids will provide a buffering action at about pH 2, reducing the possibility of making the yeast slurry so acid that the yeast will be killed, and making it easier to achieve the desired pH.

In order to avoid damage to the yeast during washing, the yeast must be kept as cold as possible. The maximum allowable temperature for the yeast is 42° F (5° C), with a temperature of 32° F (0° C) being optimal. The yeast is adjusted to the desired pH for washing. Thoroughly mix the yeast during addition of the acid so that none of the yeast is exposed to locally high concentrations of acid. After the proper pH is achieved, take 1.5% of the weight of the yeast in AMPERSUL (15 lb of 10% solution per 100 lb of yeast - liquid yeast weight depends on its gas content, but it averages 8 lb per gallon) and add slowly to the yeast while stirring. Continue stirring for 5 minutes after all the AMPERSUL is added, then allow the yeast to rest. The lower the yeast pH, the less the time needed to achieve killing of bacteria. The following time and pH combinations are recommended to achieve at least 99% killing of bacteria:

INITIAL pH	HOURS OF COLD STORAGE
2.2	2
2.4	4
2.6	8
2.8	16

The acidified yeast slurry will normally increase in pH to 3.0 or more during the washing period. Once the recommended initial pH is achieved, it is not necessary to maintain that pH during the entire wash period. It is critical to keep the yeast cold during this period.

The washed yeast should be pitched into fresh wort as soon as possible after the end of the washing. Remix the yeast slurry before pitching. It is not necessary to remove the washing chemicals from the yeast. AMPERSUL will dissipate, and the acid will be diluted. Some brewers find that the washed yeast is slightly weakened by the process and increase their pitching rate by perhaps 10% when washed yeast is used.

Approval For Use In Brewing

AMMONIUM PERSULFATE is considered Generally Recognized as Safe (GRAS) for use in brewing and is listed in the *Adjunct Reference Manual* of the United States Beer Institute.

Packaging & Storage

Store in a tightly sealed container under cool, dry conditions. AMPERSUL decomposes in water and will lose strength if exposed to humid conditions. Use within 6 month of receipt. AMPERSUL is a **Strong Oxidizer**. Keep out of contact with combustible material, especially if damp. Packed in 50 lb. polyethylene-lined fiber drums.