SEKISUI

SELVOL™
POLYVINYL ALCOHOL

Selvol™ 418 Poly(vinyl alcohol) for Emulsion Polymerization

Polymer Chemicals Technical Bulletin

Sekisui Chemicals has developed a grade of poly(vinyl alcohol) (PVOH) for emulsion polymerization, Selvol 418. Selvol 418 is an intermediate viscosity and hydrolysis grade (Table 1) which provides a balance of properties between those of fully and partially hydrolyzed grades of PVOH.

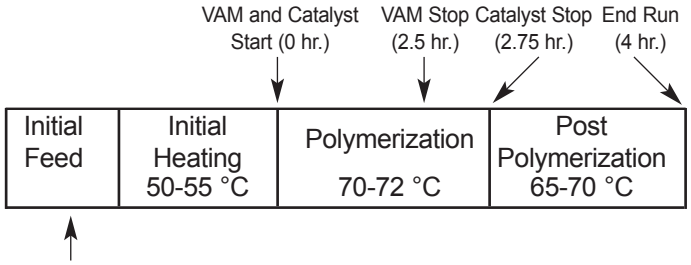
TABLE 1: TYPICAL PROPERTIES OF SELVOL 418 PVOH

Hydrolysis Level (%)	91-93
4% Solution Viscosity (cPs)	14-19
pH	4.5-7
Volatilies, % Max.	5
VOC's, % Max.	1
Ash, % Max.	0.90

The unique combination of properties offered in Selvol 418 PVOH allows for the development of emulsion polymers having greater formulation capabilities. Selvol 418 can be used by itself or in conjunction with other grades of PVOH to produce stable emulsions. The increased hydrolysis level of Selvol 418 PVOH over routinely used partially hydrolyzed grades can provide improvements in water resistance and improved compatibility with fully hydrolyzed grades of PVOH which may be post-added to the emulsion. This allows for the formulation of adhesives with improved water resistance.

Test comparisons:

The following recipe was used to evaluate Selvol 418 vs. Selvol 523 (88% hydrolyzed, medium viscosity grade) poly(vinyl alcohols) in emulsion polymerization.



Selvol 418 PVOH 6 wt. % on total VAM
Sodium Bicarbonate (Buffer) water

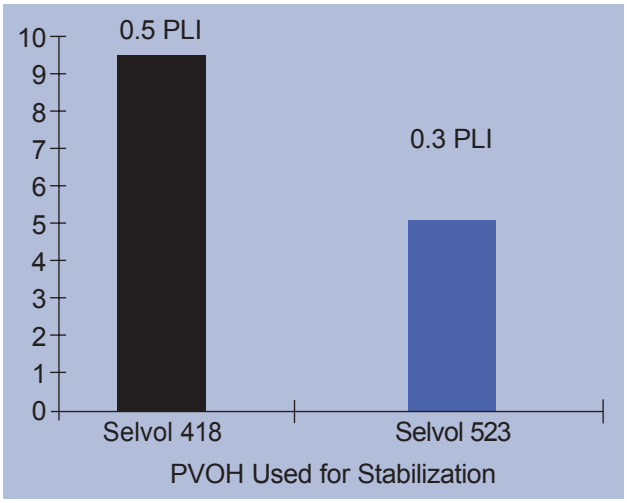
* Catalyst: Redox (H2O2/SFS).
* VAM and catalyst fed into reactor continuously during the polymerization.

Table 2 shows the resulting emulsion properties using Selvol 418 PVOH. Figure 1 is a relative measure of water resistance and Figure 2 indicates the compatibility of the emulsion with post-added PVOH. For these tests, Selvol 418 provides both increased water resistance and improved compatibility with post-added PVOH.

TABLE 2: EMULSION PROPERTIES USING SELVOL 418 PVOH.

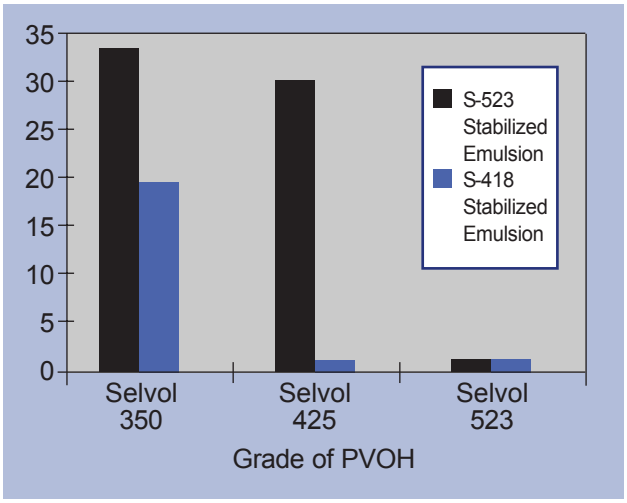
wt % PVOH/VAM	6
% Solids	55
pH	5
Free Monomer (%)	<0.5
Viscosity (cPs)	1000
Thickening Ratio	2.3
Speed of Set (sec)	6-9

FIGURE 1: RETENTION OF ADHESIVE STRENGTH AFTER 5 MIN WATER SOAK.



* PLI = Pounds per Linear Inch

FIGURE 2: COMPATIBILITY COMPARISON BETWEEN SELVOL 418 AND SELVOL 523 STABILIZED EMULSIONS.



* Compatibility test run by mixing 50/50 by volume emulsion and 10 wt % PVOH solution. The mixture was then diluted to a viscosity of 1000 cPs and stored for 1 week at 70 °C.

International Offices

North America:
Sekisui Specialty Chemicals America
1603 West LBJ Freeway
Dallas, TX 75234-6034
Tel +1-972-277-2901
Fax +1-972-277-2907
www.sekisui-sc.com

Europe:
Sekisui Specialty Chemicals Europe S.L.
Ctra. N-340 Km. 1157 Apdo. 1388
43080 Tarragona
Spain
Tel +34 977549899
Fax +34 977544982

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