## Fatty Acid Esters



(Styrene Allyl Alcohol)
Preparing Aqueous Solutions

	Step 1 > TOFA P	1 Step 2 Step 2 > TOFA/Maleate	
Т	OFA	MAN/EB	
Step 3 SB Polyester> Poly		tep 4 > Air-Dry Acrylic Emul	sion
Ammonia/EB	ВМ	IA/HDA	

Esterification With TOFA

 Step 1
 SAA-100
 1,000

 Soya Fatty Acid
 533

 Xylene
 150

These materials are stirred for 7 hours at 250°C under nitrogen with continuous removal of water and recycling of xylene. About 35 parts of water are obtained. The acid number of the TOFA polyester produced in this step is < 1.0 mg KOH/gm and the residual OH number is 70 mg KOH/gm.

Esterification With MAN

Step 2 TOFA Polyester 1,000
Maleic Anhydride 98
Butoxyethanol 250

The maleic anhydride/TOFA polyester mixture was stirred at 125°C for 4 hours followed by dilution with butoxyethanol. Propylene Glycol PNP can also be used instead of butoxyethanol to give a HAPs free formulation. The resulting maleinated polyester solution has a hydroxyl number of 10 mg KOH/gm and an acid value of 42 mg KOH/gm.

Neutralization and Emulsification

Step 3

Step 4

Maleinated Polyester 1,000 30% Aqueous Ammonia 57 Water 1,100 Butoxyethanol 157

The maleinated TOFA polyester from step 2 is first neutralized with ammonium hydroxide at ambient temperature to pH 8-9. The resulting solution is then dispersed in a mixture of water and butoxyethanol. Glycol Ether PNP can also be used instead of butoxyethanol to give a HAPs-free formulation.

**Emulsion Polymerization** 

Polyester Emulsion 1,000 n-Butyl Methacrylate 445 1,6-Hexanediol Diacrylate 11 Water 500 5% Ammonium Peroxydisulfate 50

This mixture is slowly heated to 80°C and stirred for 2 hours at that temperature to give a storage-stable acrylic emulsion. The adduct solution from step 2 is treated with aqueous ammonia to a ph between 8 and 9. It is then diluted with the mixture of PNP1 and water to give a clear emulsion.

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