

## LATEX FOAM

Concentrated latex 60 % ( Ammonia preserved HA OR LA ) LA is better for Dunlop process

### **Foam promoters and stabilizers**

*Promoters are carboxylate soaps and / or resonates*

Castor oil soaps ( less efficient foam promoters)

Potassium oleates etc (fast frothing and give fine textured foam)

0.2 – 2 phr ( is a function of expansion required)

foaming tendency PH dependant ( 6 –9)

ability to promote and stabilize foam is a function of hydrophobic moiety) – more length give more efficiency – less solubility

*Stabilizers are:*

1. Quaternary ammonium surface active compounds
  - n- hexadecyltrimethylammonium bromide
  - n-hexadecyl pyrdinium bromide
  - n-dodecyl tri(2-hydroxyethyl)ammonium hydroxide
2. Amino compounds and amine oxides
  - Diphneylguanidine
  - Triethyltrimethylenetriamine
  - Trimethylenetetramine
  - Tetraethylenepentamine
  - N-hexadecyldimethylamine oxide
3. Organic hydroxy compounds
  - eg. Phenol and hydroxytoluenes
4. Water soluble hydro colloids
  - Glue, Casein, Cellulose derivaticw, PVA

Loading 0.1 to 0.5 of foam promoter

Action : They enhance the stability of Air/water interface

Destabilize rubber water interface relative to air /water interface so that latex gels before the foam has collapsed appreciably ( so they are also called gel sensitizers)

The adsorbed cations of foam stabilizers interact with the surface adsorbed anions

### **Vulcanising system**

Sulphur 2

ZDEC 1 phr

ZMBT – secondary accelerator ( MBT – being slightly acidic colloid destabilization, and MBTS insufficiently active at vulcanisation temperature – hence ZMBT

ZMBT increases modulus

ZDEC/ZMBT	2/0	1/5/.5	1/1	.5/1.5
Modulus at 50 %	16	35	32	34
Eb	345	277	273	233

### **Fillers and softners**

Kaolinite clays, cal.carbonate upto 30 phr. 20 phr is more usual (upto 60 phr also encountered). May added as dry or as dispersions.

### **Softners**

Mineral oils up to 5 phr to promote interparticle coalescence during gelation. Larger amount is used to facilitate higher filler loading

### **Flame retardant**

Chlorinated paraffin was, antimony trioxide, zinc borate and hydrated aluminium oxide are used

### **Antioxidant**

DNPD, 2,2' methylene bis(4-methyl – 6 – t-butyl phenol)

## **PROCESS**

Latex  
Oleate  
Sulphur  
Accelerator  
Antioxidant  
Filler  
Oil

MATURATION (25-30 C 1-3 days under gentle stirring)

Foam stabilizer  
ZnO  
SSF

Rapid transfer to mould( with mould release agent and warmed to 40 C)  
Lid closed  
10 minutes ( gelation)  
curing in air oven / steam oven 100 C 30 – 45 mins)

### **Continuous process**

- More uniform product
- Superior texture
- Uniformity of cell size and density can be easily varied
- Low density without long whipping time
- Minimised loss
- Low rejection and labour cost

*Latex for this method:*

TS not less than 61.5  
DRC /TS not less than 0.98  
MST not less than 540  
VFA not greater than 0.2  
KOH Number not greater than 1.0

Oakes mixer

