

role of chemical defoamers in the manufacture of pulp and paper[†]

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The development of foam, though a common occurrence in the production of pulp and paper, is not only troublesome in smooth working, but at times affects the quality of products. Its complete control can only be effected by careful study of its causes and the application of certain known cures both mechanical and chemical.

The causes of foam formation are not fully understood. The nature of the stock and its manner of delivery to the paper machine are themselves cause for foaming. Present day high speed machinery tends to aggravate it. The following practical considerations are some of the contributing factors for the occurrence of foam :

- (a) Mechanical equipment
- (b) pH of Stocks
- (c) Method of handling stock between machine chest and paper machine.
- (d) Sizing materials
- (e) Chemical additives
- (f) Machine Speed.

In majority of Paper Mills, foam becomes bothersome on the paper machines. On Fourdrinier machine it collects on the pond or at some nearby point. Many a times it flows with the stock on to the wire, causing spots on the paper. On the Cylinder machine, foam collects in the Vat, causing uneven formation on the cylinder. At times it builds up until it touches the sheet.

Foam also collects in the regulating boxes, and on the screens, cutting down the screen capacity. At this point severity of foam may not be much but elimination will improve the quality of the production.

In the Pulp Mill foam usually occurs on screens, riffles and washers. In some instances the waste

wash water foams so badly that any amount of water spray would not help, and a chemical defoamer may have to be used for easy disposal.

Usually foam is visible in the form of froth or plainly visible, occurring at various points in the flow of stock through the mill. Foam is also noticed as minute bubbles of entrained air, that form in the stock delivery system and are carried along in the sheet as it is formed.

In order to overcome the problems of foam, many Chemical Defoamers are used. In good old days usually mineral oils were used, but effect of these oils were limited. With the advancement of Science many more chemical defoamers are made available to the industry both in liquid as well as in paste or semisolid forms.

Chemical Defoamers attain popularity because of the following properties:

They are odourless.

Cause no discolouration, oil or grease spots.

They are water dispersible and will not tend to fill up the felt.

Used under acid or alkaline conditions.

Compatible with common sizing agents.

There is a wide choice from which Paper Maker can select a right type of Defoamer to suit his mills requirements. The effective utilization of these defoamers can be done by selecting the advantageous point to introduce the defoamer, either in solution or in emulsion form. This point may need some experimentation. However, the defoamers are usually added before the spot where the foaming occurs. For example if the foaming occurs on the screen, apply defomer at the upper end of the screen box or at the upper end of the screen.

[†]By Courtesy : Technical Society, Brajrajnagar

ROLE OF CHEMICAL DEFOAMERS IN THE MANUFACTURE OF PULP AND PAPER

The advantages by the use of Chemical Defoamers are innumerable. Some of them are listed below:

- (i) Maximum foam, killing efficiency at the lowest possible cost per ton of pulp.
- (ii) Improved formation and uniformity resulting from better fibre dispersal.
- (iii) Improved drainage on paper machines.
- (iv) Improved drainage in pulp washing resulting in cleaner stock.
- (v) Improved surface characteristics, absence of foam spots.
- (vi) Increased production, smoother machine operation, fewer wet breaks.
- (vii) Reduced tendency towards pitch agglomeration.
- (viii) Use of Defoamers improve sheet formation, aid sizing and improve ink resistances.

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