

Deinking of Newsprint—A Recent Trend and an Innovation

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Deinking of newsprint seems to me another way out

- For meeting the Newsprint shortage.
- For serving as the right, timely fill up for Raw Material shortage.
- For utilising an alternate source of fibres which have been going as waste and shall be going as waste.
- For conserving the Forest the Resources and fibrous raw materials
- For saving foreign exchange.

and has a special significance for the under-developed Nations and is of utmost and immediate importance for a country like that of ours.

India is a big country with teeming millions (i.e. 480) and needs about 350-370 tons of Newsprint per day and this consumption is bound to go up in years ahead with the increasing population and increasing literacy and ever increasing tempo of industrialisation. The only Newsprint Mill of our country—The National Newsprint & Paper Mills Ltd., having made much headway since the very inception is able to supply 22-24% of the total demand and for the rest, we have to depend upon imports. The Third Five Year Plan is on its last breaths and our country could not see another Mill for another 2/3 years or even more. There have been very many plans for the manufacture of Newsprint which got lot of publicity during all these years and some of those have been shelved and still some which may be coming up are:

- (1) Newsprint Mill (120 tons per day) utilizing at Nangal (Punjab) conifers from the Himalayan Region— (M/s. Karamchand & Bros., Calcutta.)
- (2) Newsprint in (100 ton/day) based on Bagasse Moradabad (U.P.) (M/s. Birla Bros., Calcutta.)
- (3) Newsprint Mill in (100 tons per day) M/s. Sangli (Maharashtra) Shetkori Sakhar Karkhana Ltd., Sangli (based on Bagasse).

Besides Nepa's expansion from the present production of 30,000 tons/year to 75,000 tons/year which may take another 2-3 years seems to be the only silver lining in these dark clouds and would be a big landmark in the history of Newsprint Industry and a very big welcome. Very scanty attention has been given to the Newsprint Industry and this has cost our country foreign exchange to the tune of crores all these years approximating to 7-8 crores a year. Industrial progress on the whole has got a very big set back due to the Chinese invasion in 1962 and the recent Pakistan's aggression and it would take quite a few years to recover from these terrible shocks which have shaken the whole Nation but the way our people have fought irrespective of caste, colour and creed needs praise and all appreciation.

If we have to keep pace with the every increasing and expanding population and increasing per capita consumption, we must probe ways and means and new vistas for increasing the Newsprint production of our country. Reuse of the secondary Fibres—that is Deinking of used Newsprint to be a way out of conserving our slowly depleting and dwindling Forest resources, fibrous raw materials and increasing

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labour, wood costs. In a report on "Wood Handling in Canada", Mr. C.W. Heckroth remarks "Not only are wood handling costs getting ridiculous—By 1975 the world is going to be scratching its back side for lack of fibres." (Pulp & Paper p. 45; Sept. 1965).

In U.S.A. Deinking of Newsprint has been done with very great success and promising results at Garden State Paper Co., Garfield, New Jersey, pioneer of this Deinking process is Mr. R.B. Scudder, publisher (Newark News) and President—(Garden State Paper Co.) Mr. Scudder's intensive/extensive Research work for 11 years along with Mr. R.H. Illingworth, Chemical Engineer (Newark Times) made possible to work out the Chemical (i.e. Detergent) used in Deinking. Others associated with Mr. Scudder in this Deinked Newsprint Mill are:

Mr. R. O'Donoghue—Designer of the Deinked Mill
(Consulting Engineer, New York, USA).

Mr. E. Mahannah—Project Engineer of the Deinked & Mill (Manager Pulp and Paper Division—Lockwood Greene Engineers Inc: New York—U.S.A.)

The idea of such a Deinked Mill Mr. Scudder had been busy with as early as 1940. Pilot Plant started in 1946. Experimental work had been done at Herty Foundation Savannah—Ga. (U.S.A.) (1952) and later at State College of Forestry Laboratory, Syracuse, New York, with trial Runs at a News Plant Mill in Maine and a Book & Millat Mass. The dynamic success, fine run of these commercial trials led to the construction of the Deinked News Mill in July 1960 and subsequent operation in October 1961. The principal Investor in this Mill is Newark (N.J.) Evening News.

Mill's Original Designed

Capacity	150 tpd.
Paper Machine Speed	1450-1500 fpm.
Fourdrinier wire width	228 Inches (Trim— 210 inches)

Fourdrinier wire length	128.5 feet.
Headbox (Pressurized)	Beloit Corp. (U.S.A.)
Designer/Builder of the Paper Machine	Rice Barton Corpn. Worcester—Mass. (USA).

At the start up of the Mill 15% of virgin fibres (Unbleached Sulfite) had to be used along with Deinked News, which later on were cut down to 5.0-7.0% and now the furnish for Newsprint consists of 100% Deinked News (0% long fibres). The speed of the Paper Machine has been taken up from 1050 spm to 1600 f.p.m. resulting on an output of 204 tpd from the initial 100 tpd.

Strength of the repulped Newsprint is not diminished to an appreciable extent because of the Nature of the "Scudder Process"—which consists of simply mixing the used News Papers with the chemicals (including the Deinker) at 135-140°F in the pulper. During washing/cleaning there is little loss of fines (Groundwood) but the chemicals fibres are normally retained.

The quality of newsprint made at Garden State Paper Co., is commercially acceptable and matches well with the Newsprint from United States Canadian Mills and at the same time the production costs are lesser than the conventional methods. Standard price of Newsprint being \$ 124/Ton and the price for the Deinked Newsprint is \$ 120/Ton. About 10% of the Deinked Newsprint is being consumed by the Newark News and the rest is being shipped over to more than 40 customers.

A Research Organisation's continuing tests on Deinked Newsprint (Garden State) indicates various properties—Brightness, opacity, printability comparing favourably with average Newsprint (Wood pulp). The Deinked News sheet is also rigid and not limpy as is true of Deinked Newsprint, The formation is also uniform.

- Brightness (Tappi Standard)—59-62.. (Industry Average; 59-61)
- Opacity. .95% (Industry average 92%)

- Printability (Laroque proof press) 65-70%
(Industry average 67%)
- Moisture..6-7%—(Industry average 7-7.5%)
- Tear value (Elmendorf)—30—(Industry average 30-32%)
- Basis weight—31Lbs.—(Industry Average 31-32 Lbs.)

The old adage—"The customer is always right" and is the best judge of the product, he uses. Following are the various customers' comments testifying the acceptance and quality of Newsprint from Deinked News and ultimately the success of the "Scudder Process."

- * Sheets' Runnability is better than the Average.
- * Sheet's uniformity/whiteness enables it to stand comparison in density and printability with the best Newsprint in the market.
- * Experience indicates quite a satisfactory break performance average—whiteness, tensile strength and impression qualities exceed the medial performance.

Because of the remarkable achievements, and laudable success and very many process improvements in the manufacture of Newsprint from Deinked News, stability of waste News Papers supply and good Newsprint market, Garden State Paper Co., officials are going ahead with not only doubling the Newsprint production—installing another Paper Machine (Rice Barton Corpn. U.S.A.) Having wire (Fourdrinier) width 256 inches and speed 1900 fpm. Master plan having been completed by Lockwood Greene Engineers Inc. 200 Park Avenue, New York 17; N.Y. (USA) but at the same time are going to build a New Deinked Newsprint Mill at Cucamonga (Loss Angeles) California, going in production in January 1967 and the production capacity being 80,000-100,000 Tons/year, Mills planning is being done by M/s. D.R. Warren Co., (Loss Angeles) and Alvind H. Johnson and Co. 441, Lexington Avenue, New York 17, N.Y. (U.S.A.).

Deinking of Newsprint is also being done in

JAPAN of which Mr. Dimshit gives an account in his paper.

In Europe it is mainly the Groundwood Pulp which has been replaced by regenerated Deinked waste Paper and Newsprint is manufactured in some Paper Mills with the addition of 15-20% Deinked Waste News—resulting in better strength and improved printability, good formation and drainage and greatly reduced breaks between the couch and the press. Toilet Crepe is manufactured with the addition of 50-100% Deinked Waste Paper. The furnish is easily processable on the Paper Machine and the product has uniform formation, higher strength, properties and fully meets specification laid down by European Sanitary Regulations. Board Mills also use upto 100% Deinked Woody Waste for making underliner and backliner. 100% deinked wood-free waste is being used for top liner. The flotation Deinking installations operating in Europe have replaced 12-13% of the normal softwood requirements of the German Pulp and Paper Industry.

An Austrian Paper Mill also manufactured Newsprint from 100% Deinked material with resultant strength, characteristics and printability much better than those of comparable Paper from a normal furnish.

Normally 2 methods of "Deinking" have been used—"Washing out" and the "Flotation process", the latter having decided Economic Advantages over the former, which are enumerated below:

- ***** Lowest Water Consumption.
- ***** Low volume of effluents and minimum of stream Pollution.
- ***** Minimum fibre losses* (3-8% stock losses as compared to 30% in the washing out process) and Higher fibre yield.
- ***** Efficient removal of foreign undesirables (Ink balls impair good Paper formation and Affect Felt life).

J.M.Voith GMBH, 7920 Hedenheim (Brenz), (West Germany) are the builders of the FLOTATION Deinking Installations. At present more than 18 voith's Deinking installations are operating in Europe and these have not only proved their decided outstanding merits in European continent but at the same time enjoy an ever swelling, ever increasing popularity also in other countries—England, Argentina, Japan, South Africa, etc.

Other Deinking Installations are by M/s. Denver Equipmant Co., and Dorries Co. "Deinking" has been described as Paper Maker's art and science in past but is fast becoming a science and lessening as an art and following are the various remarks about "Deinking":—

1. Said a Deinker from Kalamzoo and one from Ohio added too
"Deinked stock is the best
we have tried all the rest,
But beware of 1972". (Mr. J.L. Clouse)
2. There is a bright future for Deinking and it is an economically attractive, proposition if done right. (Dr. G. Baldauf)
3. High Initial cost, space shortage, effluent problems make many Mills only consider Deinking.... (Mr. O.P. Fussell)
4. We feel Deinked stock gives us a definite manufacturing advantage. (Mr. W.D. Boggess)
5. Cleanliness is the prime consideration if only Deinked stock is to be competitive. (Mr. D. Clark)
6. There is increasing commercial importance of reused wood fibres (Mr. M.R. Reupen)

In U.S.A. 70-75% of newspapers are being discarded but in India we are normally discarding 100% of our Newspapers. I would not delay and hesitate in striking a note of warning that this should stop forthwith as it is on an utter and entire/sheer and criminal waste of fibres and we have to put to use these fibres (i.e. Newspapers) today and tomorrow, sooner or later and the earlier the better, we have

to educate our masses the ways and means of economising and eliminating the waste to the maximum possible extent which has been there, may be there. and which we can ill-afford.

For achievement of this objective we may arrange for broadcast on the Television and Radio and also in the Newspapers and Paper Trade Magazines:—

"Do not waste Newspaper—Save Newspapers"
or "Save Newspapers—Save foreign exchange, Avoid dependence on imports"

—Country in Emergency needs your help, co-operation—Read and Return.

—Keep cost down.

—Help in conservation of forests and Natural Resources.

—Waste Newspapers alternate Raw Material for Newsprint Industry.

In the initial stages used Newspapers collection may present some bottlenecks and difficulties but these would be overcome with the mass education, proper publicity and advertisement in the due course of time. This all would be in the interest, betterment of our fast developing country and—Reuse of Newspapers would be of paramount national economic importance.

Waste news supply should be economical, stable for a Deinked News Mill besides being uniform and neatly baled which would go to greatly improve the storage, quality of the final product. Advantages that such a Deinked News Mill would entail are:—

- * Modest or lesser costs of equipment and Mill construction as compared to a virgin pulp mill (Total savings may be 40—50%).
- * Lesser Building cost, lesser equipment (Fewer process steps)
- * Lesser stream pollution. No atmospheric pollution (Both being health hazards in a conventional Newsprint Mill.)
- * Significant saving on refining power (excessive refining would weaken the Deinked fibres and destroy the physical characteristics).

- * Judicious recirculation of Paper Mill while water through the Deinking Mill—an extra source of valuable fibers recovery.
- * Soiled broke not much of a problem can be easily processed in the Deinking system with the minimum of loss.
- * Conservation of Forests and fibrous Raw Materials.
- * Saving of foreign exchange—A permanent Relief.
- * Releasing white printings, other papers for other uses. These being used to overcome the present shortages of Newsprint and are unnecessary extra burden on the publishers undermining their economy, cost of white printings being Rs. 1580/Ton (After deducting excise duty) as compared to Rs. 878/ton of Newsprint (imported).

(White printings Paper's use can be an emergency measure and cannot be an all time substitute—Remedial measures are the need of the hour.)

I feel a 100 tpd Deinked Newsprint Mill would cost Rs. 3-4 crores as compared to Rs. 9-10 crores or even more for a conventional wood pulp Newsprint Mill of the same capacity. Such a Mill would :

- not take much time for erection and subsequent operation.
- go to decrease the demand on slowly dwindling forests. (i.e. net saving of 200-220 tons of fibrous Raw Materials Pay—the Normal of a wood pulp Newsprint Mill (100 tpd.)
- permit New Paper Newsprint Mill installations and expansion without forcing the older Mills to shut down.
- go to alleviate the shortages of Newsprint which have become more than chronic and have come to stay and especially at such a juncture when other Newsprint Mills have not made any appreciable headway. Some

of these having been dropped or shelved and some may take another 3-4 years and even more and this inordinate delay being due to one reason or the other.

—go to bridge the gap between the increased readership and the allocation because of two armed conflicts.

—go to save foreign exchange of Rs. 2 crores annually, less dependence on the imports, easing thereby the economic position and would be an all-time relief.

Deinking installations (20-40 tpd) using waste newspapers should forms permanent and regular feature of the existing and the future Newsprint Mills of the country. Such installations would not involve any substantial sums, would be the most easy, safe and cheap method of increasing the indigenous Newsprint production, be playing an important part in the efficient operation of an integrated Mill and would serve as a “Super Save-all” being the last straw on camel's back.

I further feel and recommend locating very safely and easily such a “Deinked Newsprint Mill” near a Sugar Mill and using Bagasse Pulp (Chemical: Mechanical) to the extent of 40-50% along with the Deinked News for the manufacture of Newsprint. The Newsprint Mill can be of 200-250 tpd capacity. Such a new and uncanny Newsprint furnish (i.e. Deinked News and Bagasse (Chemical and Mechanical Pulp) never used in the history of Newsprint industry in the world would cover up the various shortcomings, speculations—such as cheapness, print-through, show-through strength, opacity, brightness, ink absorption, product, quality (Newsprint) etc., which have been the main limiting and hindering factors in putting up Newsprint Mills based on 100% bagasse so far. The problem of bagasse based Newsprint Mills has been the subject of research, development and discussion all around the world all these years. The main decided advantage of such Newsprint Mill would be that it would dispense with the woodlands (soft or hardwood) supply of pulpwood and costly mechanical pulping and

allied equipment. Bagasse is already being used by many mills in India and has proved its value and worth as a valuable paper making raw material and is available in abundance. Future expansion of Newsprint and Paper Industry and its continued further prosperity cannot depend for all time and all ages on the conventional raw materials (i.e. bamboo, wood, etc.) and we have to explore other raw materials. Bagasse on which we are pitching our future and full hopes and waste newspapers seem to be the newcomers having an unlimited big potential.

In the light of above facts and figures, going on for either a Deinked Newsprint Mill (100-150 tpd) or/and Newsprint Mill (200-250 tpd) utilizing 40-50% of Bagasse Pulp (Chemical and Mechanical) along-

with deinked News lies the solution of Newsprint crisis and the salvation of our country. Both the propositions seem to me economic, attractive and would be all welcome and a boon for our country. These should receive the utmost and immediate attention of our Government and the mills may be put up in Public Sector if the Private Entrepreneurs are hesitant and afraid of going in for such much-needed and timely ventures. The planning for solving the Newsprint crisis has to be judicious with little bit of risk taking various stumbling blocks and problems coming in the way should be hammered and hammered well in time before it is too late.

Mechanical Pulp from Bagasse has good drainage characteristics, high opacity and printability.