A Shift from Neutral Sizing to ASA Sizing: Case Study at Ballarpur Industries Ltd; Unit-Sewa

Choudhury K. C, Sridhar P, Balakrishna S, Ravindra B. S, Thapiliyal L. V & Gupta Ajay

ABSTRACT

Alkaline sizing technology (AKD / ASA) goes back to early sixties. The driving force behind it was to use Ground Calcium Carbonate (GCC) as filler for cost effectiveness in European Countries. Slowly paper Industries started shifting to AKD or ASA sizing to use GCC. In 1970's & 80's most of the European Paper Mills embraced Alkaline Papermaking.

Though cost was the driving force, much more side benefits were observed like sheet permanence, enhanced brightness, increased opacity and sheet strength.

In India Calcium Carbonate is a costly pigment and Talc is still prevailing as the cheapest and mostly used pigment as filler. Due to quality competencies and globalization of market, Indian Paper Industries started converting to Alkaline Sizing in 21st Century. Increased cost and non-availability of rosin size added interest in shifting to AKD / ASA.

Ballarpur Industries Ltd, Unit: Sewa shifted from neutral sizing to ASA sizing in January-2008 and running successfully in PM#2. This presentation elaborates the path fallowed by the team to achieve it.

INTRODUCTION

In the current decade a rapid conversion from acid / Neutral to alkaline sizing is seen in Indian Paper Industries. To use Calcium Carbonate as filler and getting the benefits over Talc is the secondary objective due to higher cost of PCC / GCC and other draw backs of GCC. The primary objective of conversion is quality competencies due to globalization of market.

Paper Industries in India are switching over to alkaline sizing to impart sheet permanence, higher brightness, less reversion, brilliant shade and higher strengths in their products. Then question arises to adopt which one out of the two major products available AKD or ASA.

Out of the above two options AKD is the oldest one started in 1958 by Hercules in the brand name of "Aquapel". Hence use of AKD is well experienced by Industries, as observed from the publications. It is a wax and gives a comparatively stable emulsion. Hence readymade emulsions are available with suppliers, which can be dosed directly to the system. It can also be emulsified onsite with little investment. On the other hand, ASA must be emulsified onsite and to be used immediately. The investment on emulsification is also higher than AKD.

Machine runnability and wet-end issues are comparatively less with AKD than ASA. But AKD sized paper gives more problem in cutting, finishing & printing. Due to slipperiness of sheets counting and finishing problems were always there. Besides this, it gives sheet size variation & other problems in A4 cutters. In the printing press also it creates runnability issues. Operators have to slowdown the printing machine to maintain accuracy. This is probably due to build up of free wax on gripper rolls within the press itself, which then could not grip in the same way.

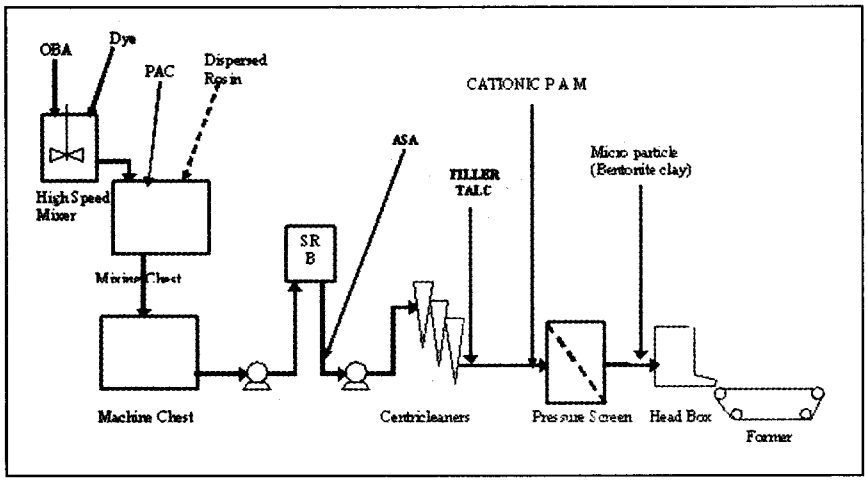
AKD does not give on-machine sizing. The sizing property develops after curing. Paper Mills having pond size, faced runnability issues at size press due to high aqueous starch pick up for slack sizing. ASA does not give such problems due to on-machine sizing.

AKD works in operating pH range of 7-9 whereas ASA works in a wider range of 5.5 to 9.0 pH. High alkalinity system is not mandatory in case of ASA. Hence it is easy to shift from rosin size to ASA size by slowly changing the pH. Only thing is the stickies and deposit problem is to be taken care of. Hence Bilt: Sewa decided to adopt ASA as alkaline sizing medium.

Table -1

Sl No	Particulars	AKD	ASA
1	Onsite emulsification	Optional	Must
2	Emulsification investment	Nil / low	High
3	Cationic carrier	Must	Must
4	Runnability & wet-end issues	Low	High
5	On machine Sizing (Cobb)	No	Yes
6	Drying profile	High	Low
7	Conventional pond size press	Obstacle due to high Cobb before size press	No issues
8	Cutting and converting issues	High	Nil
9	Slipperiness (Finishing issues)	Yes	No
10	Operating pH	7 - 9	5 – 9 (one band overlaps with neutral sizing)
11	Stickies / Deposit potential	Yes	Yes (more in presence of Calcium ion)

Ballarpur Industries Ltd, Unit:Sewa Gaganapur, Jeypore (RS)-764002, (ORISSA)



Picture-1 SCHEMATIC DIAGRAM OF DOSING POINTS

Table-2		Control	Trial			
Particulars	UOM	60gsm	54 gsm	57 gsm	66-68gsm	75 gsm
Raw chest pulp pH	-	5.8	5.9	5.9	5.8	5.9
Load on refiners		210	221	230	204	239
Refined °SR	°SR	29	23	22	23	24
Head Box freeness	°SR	44	36	34	37	34
Basis wt	gsm	60	54.0	57.0	66.8	75.0
Machine Speed,	mpm	460	459	459	460	460
M/c draw,	T/hr	5.2	4.6	4.9	5.8	6.4
Couch Vacuum,	mm Hg	240	245	235	289	298
H/B Consistency,	%	0.603	0.539	0.575	0.660	0.713
B/W Consistency,	%	0.109	0.105	0.105	0.116	0.105
FPR,	%	82.35	79.9	81.6	82.5	85.2
FPAR,	%	52	43.5	55.0	47.2	57.2
H/B ash content,	%	14.7	12.3	17.8	19.1	11.9
B/w pH	-	6.1	6.5	6.3	6.1	6.3
PAM dosage,	g/T	110	126	111	87	127
Bentonite dosage,	g/T	173	194.3	184.3	155.9	140.6
ASA dosage,	Kg/T	0	0.9	1.1	1.0	0.9
Cationic Starch,	Kg/T	0	2.9	3.6	3.3	3.3
Cationic Starch SRB,	Kg/T	0	3.3	3.1	2.5	0.0
PAC dosage,	Kg/T	10.6	2.4	6.0	2.6	3.0
Dispersed rosin,	Kg/T	15	0.0	0.0	0.0	0.0
OWA dosage	Kg/T	1.8	1.6	1.7	1.3	1.7
COBB-60	g/m^2	20.4 / 21.6	19.5 / 21.8	19.2 / 20.2	20.4 / 21.7	21.4 / 22.0

Table-2Wet-end & machine parameters during ASA Trial.

Brief manufacturing process at Bilt-Sewa:

Bilt-Sewa is an integrated pulp and paper manufacturing unit having Soda Recovery, Chlorine Dioxide and Calcium Hypo preparation plant.

Furnish: -It uses 35% Bamboo, 30% Casuarina, 30% Debarked Eucalyptus and 5% other mixed hardwoods in its raw material furnish.

Pulping & Bleaching: -The mill adopted mixed chipping and mixed Kraft cooking of the fibrous raw materials to the degree of 14 Permanganate number. After four stage counter current washing, the pulp is bleached in a C-Ep-H_1-H_2-D bleaching sequence to 88% ISO brightness.

Wet-end & Machines: The unit has two machines PM#1 and PM#2. Copier paper is manufactured in PM#1 and fine quality writing printing maplitho for multi coloured offset printing (54 100gsm) is manufactured in PM#2. The total production capacity being 74000MT/Annum, the mill uses its own pulp and purchased hard-wood pulp from imported and indigenous market.

PM#1 uses dispersed rosin added to the mixing chest as sizing agent and amphoteric starch in SR Box as retention aid. The back-water pH is maintained at 5.5 6.0. The machine has a fourdrainer and a conventional pond size press.

Before switching to ASA, dispersed rosin was used in PM#2 dosed at mixing chest as sizing agent. A microparticulate based retention system was running in the machine. It comprised of a medium molecular weight low cationic polyacrylamide used at pressure screen inlet and bentonite clay at pressure screen outlet. The back water pH was maintained at 5.7-6.2. The machine has a fourdrainer and a top former. It also has a high speed metering size press.

The broke was mixed and shared by both the machines as paper shade / tint is same for all grades. Machine backwater was also shared in some points.

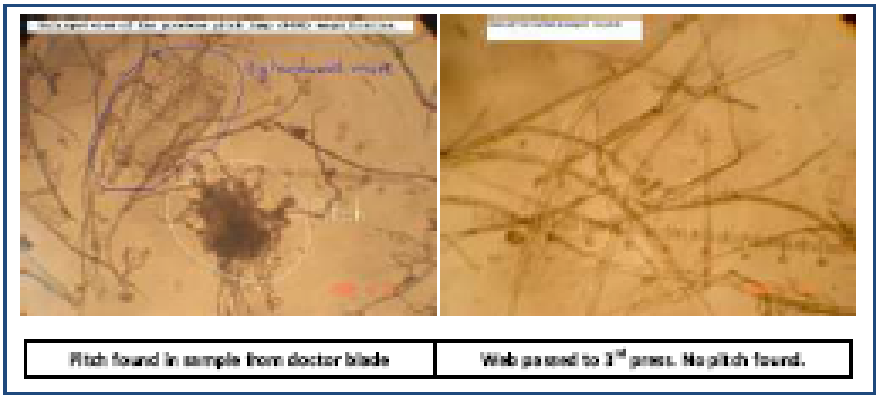
Get Set for ASA Plant Trial:

Emulsifier:

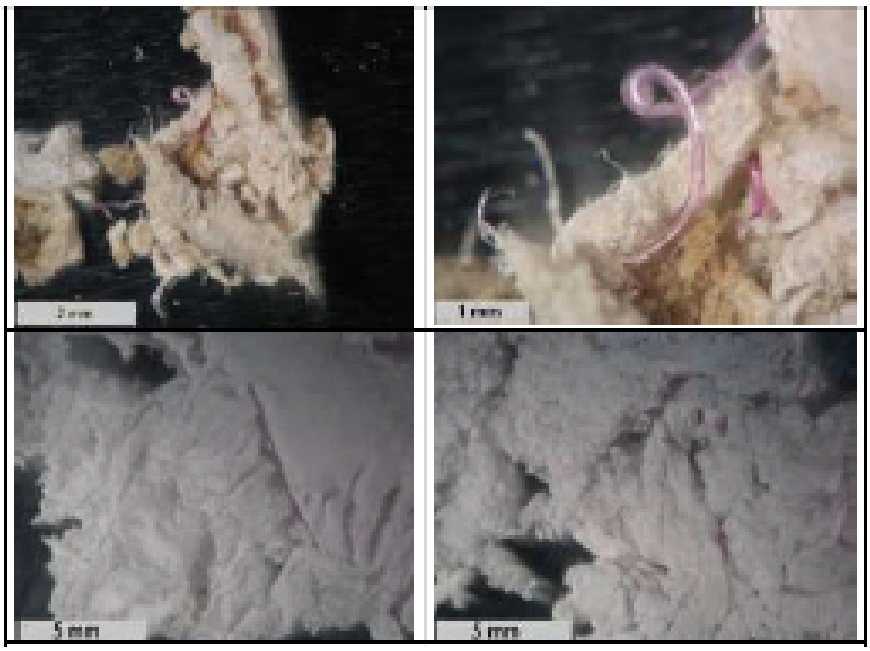
Fully automated emulsification and dosing unit along with a standby unit provided by the supplier was installed in a suitable place near to the dosing point to reduce time gap from emulsification to application point. This unit is required at site, as the shelf life of emulsion is very short.

Emulsification media:

Broadly there were two options, Cationic Starch OR Cationic synthetic polymer. Bilt-Sewa selected cationic tapioca starch for emulsification media as starch was already in use for both the machines. It has other side benefits like enhanced dry strength to the paper. It is also a very good emulsifying agent and

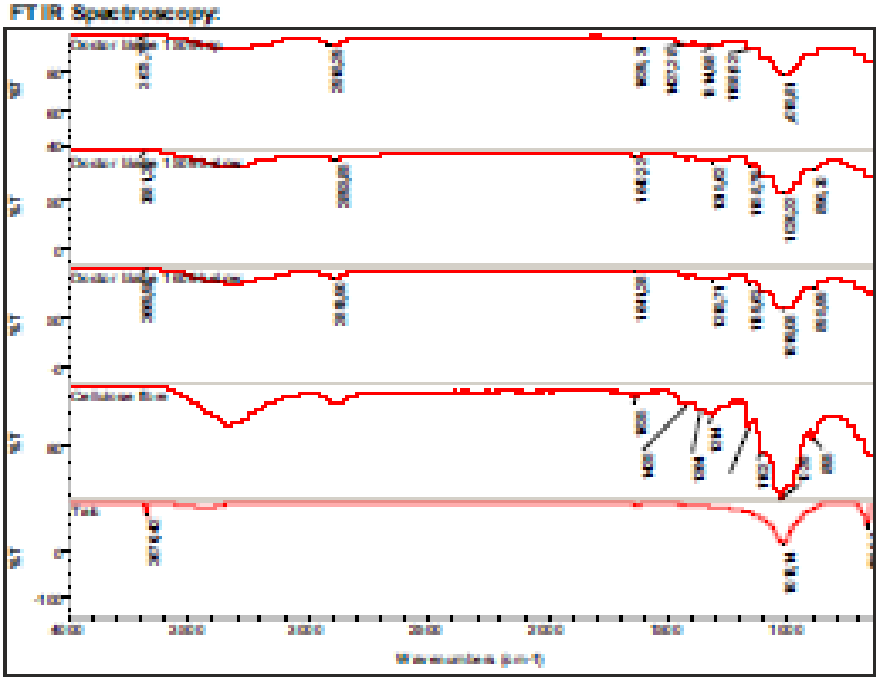


Picture-2



Picture-3 Top line: Deposit in doctor blade. Bottom line: Web passed to 3rd press

FT IR Spectroscopy:



Picture-4 FT-IR spectra of deposit sample with reference to cellulose & Talc

emulsion stabilizer in food technology. It is a natural polymer with mild cationicity. A small variation in dosages does not disturb the machine much comparative to a synthetic polymer. Hence the crew felt comfortable to choose this as emulsifying media.

Starch Cooking:

Jet cooker is the best option for uniform cooking and consistent solids. As there was no jet cooker in the unit, it was decided to cook in the conventional cooker and monitor the solid and viscosity strictly.

pH of the Emulsion:

The pH of the ASA oil is acidic (3.0) and the pH of the cationic starch is 5.5 6.5. As ASA reacts with water and produces a sticky hydrozylate which is a dicarboxylic acid, obviously at higher pH the reactivity with water will increase. Hence the emulsion pH is to be kept at 3.5 -4.0 range.

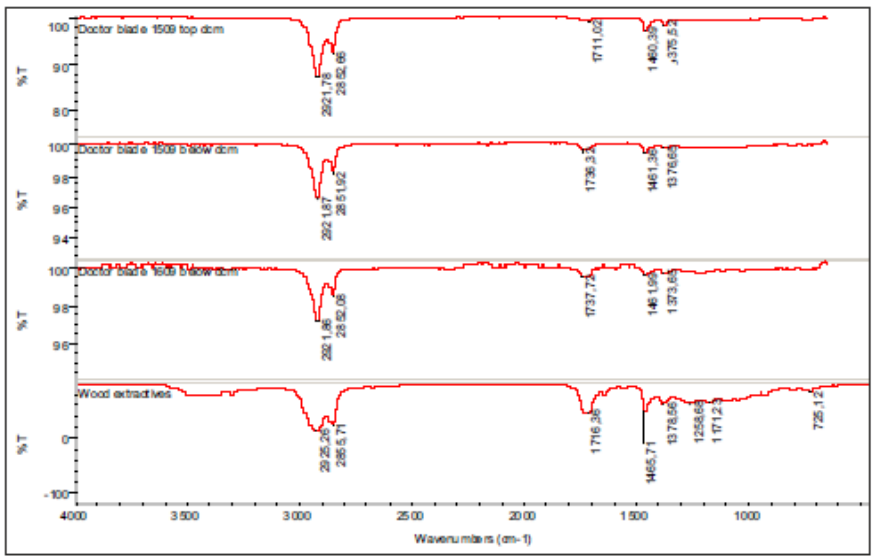
Before pumping to the emulsification unit the starch solution pH is maintained at 3.5 4.0 by adding adipic acid, citric acid or alum. Bilt-Sewa chose citric acid to use with starch.

Emulsion Particle Size:

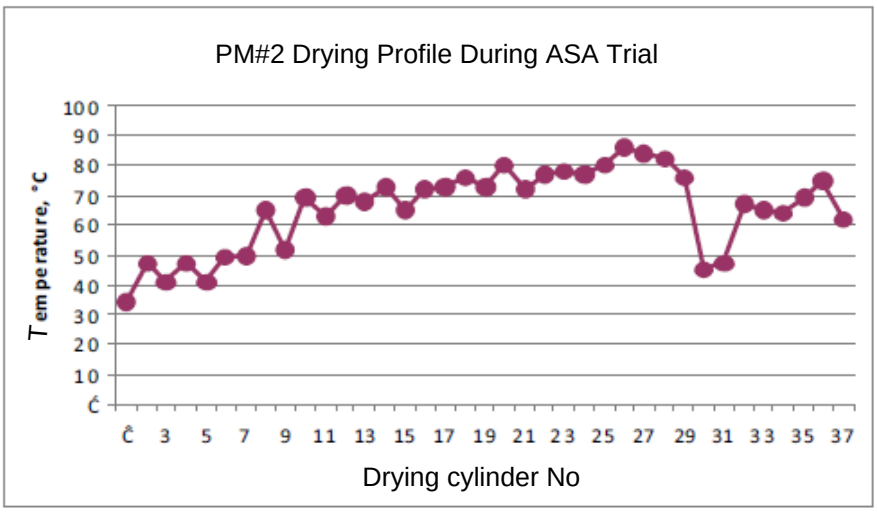
In the literatures available it is mentioned that the optimum particle size required is in the range of 0.5 1.5 micron[1]. It is found that if the particle size is bigger than 1.5 micron, then two things will happen. Number one, it will be difficult to distribute uniformly in the paper making stock as the particle size goes bigger and bigger. Number two, the surface area will proportionately be reduced and hence the reactivity. So the sizing will be reduced or the demand high.

In the same way if the particle size goes smaller and smaller then the distribution in the substrate will be better. But the surface area will increase and the reactivity will be high. It is said that particle size below 0.5 microns, the emulsion reactivity will be so high that hydrozylate sticky products will be high, which is desizing in nature.

Hence Bilt-Sewa targeted the particle size in 0.5-1.5 micron range. To measure the particle size an optical microscope, having 4 objectives (4x, 10x, 40x & 100x) and 10x eye piece, was used. The 100x objective was used



Picture-5.: FTIR spectra of DCM extract of doctor blade deposits with the reference spectra of Wood extractives.



Picture-6 Drying profile

with oil emersion. The eye piece has a cross hair and a micro scale to measure the particle size. In 1000x magnification one unit of scale is one micron. Before taking the plant trial the emulsification turbo pressure was optimized and set to 13 bar to get 0.5 1.5 micron particle size measured in this visual microscope.

Temperature of Starch Solution:

This starch is the emulsification media. Hence the temperature during emulsification is as important as pH. As the rate of reaction will increase with temperature, the hydrolysis can be minimized by keeping the temperature low. But extremely low temperature will increase the particle size which is detrimental to sizing.

The optimum temperature range is 35 45 °C for the targeted particle size of 0.5 1.5 micron. To reduce the cooked starch temperature to 40°C one heat exchanger was installed, provided by the ASA supplier.

Retention of ASA:

Retention is more important here to reduce hydrolysis. If ASA will circulate in the white water loop, then hydrozylate products will create deposit and sticky problem.

Micro-particulate based retention system was already in PM#2. Hence it was decided to take trial first in PM#2. First Pass Retention (FPR) target was minimum 80% and First Pass Ash Retention (FPAR) target was 50%.

Dosing points:

OBA & Dye was dosed in the high speed mixer just before mixing chest, which will remain unchanged during ASA trial.

PAC was dosed in the mixing chest @16Kg/T. it was planned to reduce and shift to fan pump inlet in the thin stock.

Dispersed rosin was dosed at mixing chest. It was to be stopped slowly reducing the dose.
ASA emulsion with starch was planned to dose at thick stock in SRB drop leg near to the fan pump.

Filler (Talc) was added at the primary centricleaner accept line, which will remain unchanged.
The micro particulate based retention system will be in its place. All such dosing points are shown in Picture-1 (Page No. 108).

Strategic plan for conversion:

The sustainable pH range of ASA and dispersed rosin sizing coincides / overlaps in the range of 6 -7. Hence the plan was not to disturb the system pH during transition. Gradually the dispersed rosin dose will be reduced and ASA dose will be increased. Over a period of 3-4 hours the rosin will be zero (from 19Kg/T) and ASA will be 1Kg/T.

Then the pH will be raised by reducing the PAC from 16Kg/T to 3 4 Kg/T. And the PAC dosing point will be shifted to fan pump inlet in the thin stock to control the ASA hydrozylate.

The trial:

The trial started as per the plan, by reducing the dispersed rosin and introducing ASA in to the system step by step. It took five hours to completely stop rosin in 5 steps. When rosin came to zero, ASA was running @1.25 Kg/T. ASA:Starch ratio was 1:3. PAC was not disturbed and was running @15Kg/T. The system pH was same to neutral sizing, 6.0-6.4. Maplitho-60 was running in the machine. Runnability was good and sizing was very good. On machine Cobb was 21-22 g/m^2.

As every thing was good, the very next day PAC dose was reduced to 3Kg/T from 16 Kg/T step by step and addition point was shifted to Fan pump inlet in the thin stock, which is after ASA

Table-3

			Control dispersed rosin	ASA Sized Paper
PAPER GRADE			SSML HB 54	SSML HB 54
Particulars	UOM	Spec.		
Grammage	g/m2	54±2.5%	54.3	54.8
Thickness	Micron		78	78
Bulk	cc/gm	1.45±0.05	1.44	1.43
Smoothness (Top)	ml/min	150 - 200	220-265	250-330
(Wire)	ml/min	200 - 350	210-270	185-260
Gurley Porosity	Sec/100ml		13.7	12.2
Brightness	%ISO	87 MIN	88.0	88.9
L*	C/2		91.3	91.6
a*	C/2		2.8	2.5
b*	C/2	-6.5 to -7.0	-6.7	-6.8
Whiteness	W/CIE		144.0	143.6
Ash Content	%	5 MIN	6.1	6.1
Opacity	%	81 - 83	83.0	83.8
Cobb (Top/Wire)	gsm		25.3 /26.7	20.9/22.2
Breaking length, MD/CD	m	5000/3000	4480/2830	5440/2860
Tear Factor, MD/CD		50/55	61/68	52/58
Double fold (MD/CD)	Nos		13/7	17/9
Wax Pick	Nos		12/13	13/14
1 % paper extract pH			**6.6**	**7.1**

Table-4

Chemical Consumption on Finished Production			
Sl No	Chemicals	Dispersed Rosin	ASA Run
		Kg/T	Kg/T
1	ASA	-	1.3
2	Rosin	20	-
3	PAC	17	8
4	Cationic Starch	-	4
5	PAM (Retention aid)	0.18	0.04
6	OBA	1.95	1.5
7	Soda-ash	-	1.75
8	Biocide	0.163	0.275

dosing point. ASA dose was monitored and reduced to 0.9 Kg/T as Cobb-60 was 21-22 g/m^2. Then grade was changed to 54gsm. Machine runnability was satisfactory. FPR was 77-80% and FPAR was 42-48%. Cationic PAM and bentonite (micro particle) were 100 and 200g/T respectively. All the chemical dosages, wet-end and machine parameters are tabulated in Table-2 (Page No. 108).

Due to some breakdown problem, Machine had to shut for 5 hours. After the problem sort-out, it was started with same grade (54gsm) and same condition. But machine runnability was very poor. Press picking and doctor missing observed. All the breaks were originating from binip press. Stock freeness, pH and retention values were same as of the previous day.

Due to poor runnability and heavy production loss the grade was changed to 75gsm maplitho. Runnability improved and M/C ran well. Grade changed to 66gsm and it run well. After two days again grade changed to 54gsm to observe the runnability issue. After 30minutes of change over, web break started. Runnability got very poor. Frequent press picking and doctor missing observed.

To solve this problem, the ASA to Starch ratio was increased to 1:4 from 1:3. But no improvement in runnability was observed. After five / six hours additional 3Kg/T of cationic starch added at SRBox and the ASA:Starch ratio reverted back to 1:3. The FPR increased to 80 82%. Hence the cationic PAM dose decreased to maintain FPR at 80%.

But all these changes were in vain & no solution to runnability issue in 54gsm. Grade changed to 68gsm. Again the machine ran well. It was decided to start 54gsm on the next day maintaining the same condition of 13-09-06 when 54gsm had run well for 10-12 hours up to the M/C breakdown.

The next day starch stopped at SRB. ASA:Starch ratio maintained back at 1:3. The refined stock freeness maintained at 22-23°SR. FPR maintained at 77-80% by further lowering the PAM dose to 60g/T. Then grade changed to 54gsm from 68gsm. Again breaks started at binip press, runnability got very poor. Heavy press picking observed at binip press. It feels like the web is peeling off and one layer is going down to press pit scraped by doctor blade. The material was collected from doctor blade and observed under microscope. Some pitch like materials observed. The web passed to the 3rd press was also collected and observed under microscope. No such thing was observed in this. Photographs of these slides were taken and are shown in picture-2 (Page No. 109). The trial discontinued and problems analysed for solutions.

Problems faced:

The major problem faced was M/C runnability in 54gsm due to press picking and doctor missing at binip-press. Besides this some white coating observed initially in the swim roll before 3rd press.

There was no issue of sizing; on-machine cob-60 was 20-22g/m^2. Paper quality was good. No other issue of stickies or deposits observed except bi-nip press.

Analysis:

Laboratory analysis of the bi-nip doctor blade deposits were done at site and at vender's laboratory for microscopy and FT-IR spectroscopy. The laboratory results were interpreted to find out solutions.

Microscopy at supplier's lab:

The same sample (collected from binip doctor blade) was further studied at supplier's lab for reflectance microscopy & FT-IR analysis. The micrograph is shown below in Picture-3 (Page No. 109).

The enlarged reflectance photo micrograph of Doctor blade deposit shows that it contains some synthetic fiber like material and looks like plastic (Top line). And the other part looks like pulp or paper (Bottom line).

FTIR spectra of the deposits show that it contains cellulosic material and also some talc as shown in the Picture-4 (Page No. 109). If big amounts of ASA would be present, there would be clear peak in the around 1550 cm^{-1} area. This peak cannot be detected from these spectra.

Picture-5 (Page No. 110) indicates that all what can be extracted out from the deposits were wood extractives (i.e. pitch),.but the amount was very small.

Hence it is concluded that the deposit contains fiber, talc and a small quantity of wood pitch. This small quantity of wood pitch may have created problem in low gsm (54) paper where web thickness is less. So it was planned for the next trial that sufficient PAC must be in the chest to handle the wood pitch coming in the pulp. PAC would not be reduced or shifted to fan pump.

Solutions:

As the problem is press picking, the solution is to prevent it by chemical route as stated above by using more PAC in the chest before adding ASA or physically by changing the granite rolls.

The other option was to cure it through roll passivation chemicals. And the last option was, if at all press picking is there, it should not pass through doctor blade. Hence double doctoring arrangement must be there.

For a sure success Bilt:Sewa planed for all the above solutions. So trial halted till the above arrangements being done.

The Next Trial :

As per the plan the granite rolls had been changed and double doctoring arrangement was done at binip press.

The roll passivation, wire passivation and felt cleaning chemicals with dosing systems were ready.

A dedicated Soda Ash solution preparation and dosing system was made ready to add to the pulp receiving chest to maintain the pH above 7.0 (in the range of 7.0-7.5).

The PAC was planned to continue in the mixing chest and not to reduce much as in the 1st trial.

Utmost care was taken not to mix the PM#1 broke in PM#2. The back water sharing lines were cut off.

Starch pH, solid, temperature and ASA emulsification set points were as per the previously optimized conditions to get 0.5 to 1.5 micron particle size.

Trial proceedings:

The trial started on 18th January 2008 by replacing 50% of rosin demand with ASA and continued till next day morning keeping all other conditions same as neutral rosin sizing. On 19th January rosin was completely removed and replaced by ASA.

The stock pH was maintained at 7.0 to 7.5 at receiving chest by adding Soda Ash. PAC was reduced step by step and cut down by 50%, i.e. 16 Kg/T to 8 Kg/T. but at no point back water pH was allowed to go below 6.5. It varied between 6.5 and 7.2.

\Trial was started in 60gsm maplitho. Initially press picking was observed at bi-nip press, but there was no doctor missing and no breaks. After 3-4 hours this was vanished. It may be due to initial retention variation. After stabilization there was no press picking.

Then grade changed to 68gsm and then to 54gsm. There was no press picking and no deposits. Roll & wire passivation chemicals were not used. Only felt cleaning chemical was running. It was used in regular basis even with rosin sizing run.

The drying profile improved by increasing pre-dryer temperature from 76°C (max) to 85°C (max). It was observed that the Cobb value increased upon decreasing dryer temperature. Hence keeping at least one cylinder at 85 to 90°C is beneficial. The drying profile maintained was given below in Picture-6 (Page No. 110).

Observations:

ASA consumption was 1.1 to 1.2Kg/T of machine production. It was little higher than the previous trial. The Cobb value maintained at 26 to 28g/m^2.

FPR was maintained at 78-81%. As 3.3 to 3.5Kg/T of cationic starch came along with ASA, the retention increased. Hence PAM dose reduced to 50g/T. FPAR was varied from 45 to 60% according to paper gsm and talcum dose.

It was observed that when the pH goes below 6.5 the Cobb increases. Hence Soda-ash addition is a must to maintain pH.

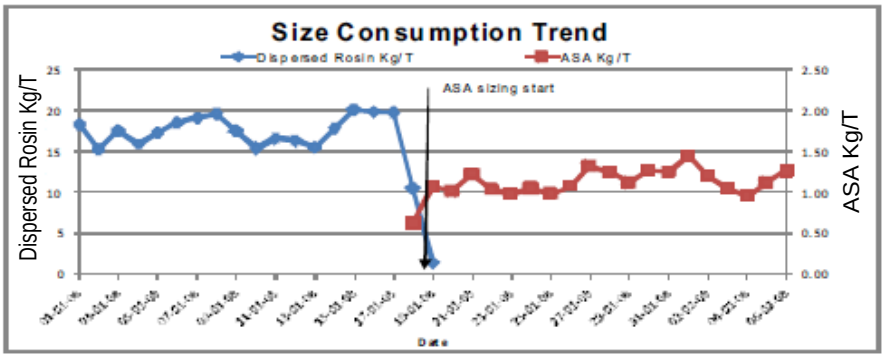
Due to rise of pH the Dye & OBA consumption reduced. OBA reduced by 30% and Dye reduced by 10%.

Bacteria count of back water was observed to be increasing gradually and after 10 days of ASA run some deposits noticed in wire tray and foil boxes. This gave a positive test to Ninhydrin indicating presence of bio slime. The biocide supplier was consulted immediately and dosage increased by 60%. The growth was inhibited and machine ran well.

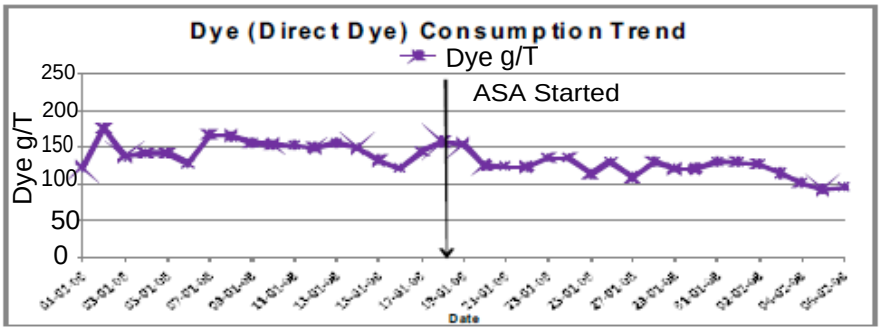
Observations on paper quality:

The prime objective was quality competencies. The paper quality data before and after switching over to ASA sizing is given in Table-3 (Page No. 111).

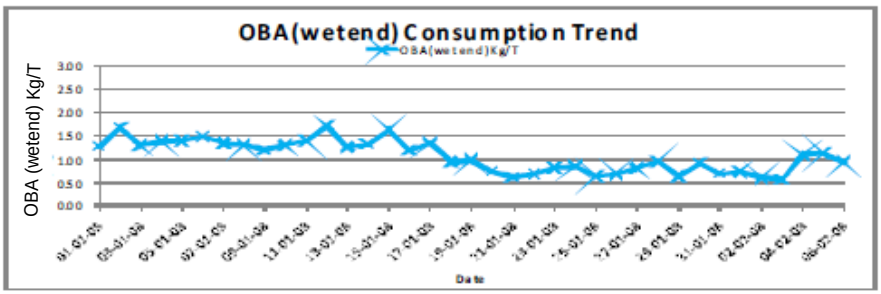
Picture - 7



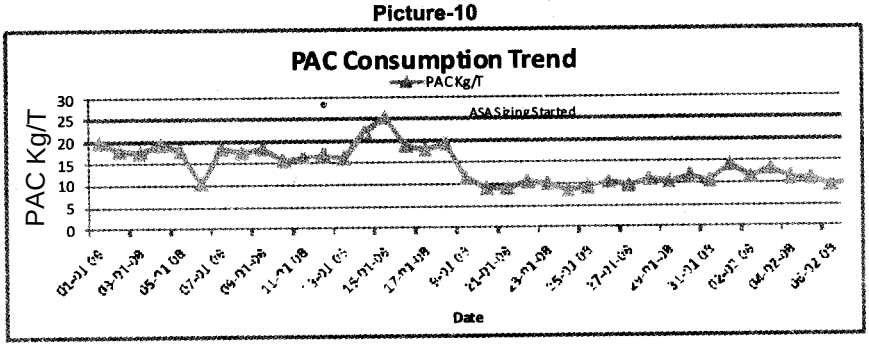
Picture - 8



Picture - 9



Picture-10



Data on the table shows that the extract pH of paper increased by 0.5 points. This indicates that the paper permanence increased and shade reversion minimized. If one could go to pH range of 8.0-8.5, it will be better but ASA consumption will be higher.

The brightness was increased by 0.6 -1.0 points in %ISO scale. This depends on Company's objective; one can get the brightness benefit by keeping OBA consumption intact or take the cost benefit by reducing OBA and maintaining same brightness.

Experiences during ASA Run:

pH:- System pH below 6.0 is not safe for ASA sizing as cobb before size press increases. The problem aggravates if there is a flooded nip size press is running. pH 6.8-7.2 is the best where Talcum is used as filler. It is already discussed about the importance of pH, the reactivity increases with higher pH and decreases with lower pH.

At pH below 6.0 the reactivity of ASA droplets were so slow that the time available before size press was not sufficient for sizing development. Hence addition of more ASA did not help much. We know, the temperature accelerates the reactivity. But the sheet before size press which is almost consolidated, further enhancement of temperature did not help. When the pH increased, it worked immediately.

Then the dosing point and machine speed are also the factors affecting it. In slow speed machines it may work below 6 pH.

Residual Chlorine: - The pulp must be washed properly. It was found that, if residual chlorine comes with the pulp the cobb increases. So the sizing chemical, retention chemical and also the PAC increases to maintain the cobb. Laboratory experiments with high residual content pulp and fully washed pulp confirms the same.

It confirms that any oxidizing chemical is detrimental to ASA. Hence good washing of pulp is required or consume more PAC. The role of PAC is not much clear here. It may be that the PAC is preventing the hydrolyzed products (di-carboxylic acids) to desize the sheet.

Where hypo bleaching is there the residual hypo will create much more problem. The calcium ion will form a sticky product with hydrolyzed di-carboxylic acid. Then PAC will help to a great extent.

Starch Solution:- It is observed that when cationic starch solids percentage decreases the cobb increases. It disturbs the ASA droplet size and retention. Hence the starch solid, pH & temperature must be maintained at the optimized points.

Chemical Consumption and Cost Analysis:

Average chemical consumption on finished production is given in Table-4 (Page No. 111) and consumption trends for ASA, Dye & OBA are shown in picture-7, 8 & 9 respectively. PAC is reduced by 50% and OBA reduced by 20%. Additional Cationic starch consumed @ 4.0Kg/T and PAM reduced by 65%. Additional soda ash dosed @1.75Kg/T. Biocide

consumption increased by 65%. Considering all additional and reducing chemicals there is a saving of Rs30/- per Ton of paper.

CONCLUSION

Conversion from acid / neutral sizing to ASA (alkaline) sizing is not as difficult as is generally felt by the paper makers. A good preparation by understanding the basics helps a lot in smooth converting.

Cost of converting is very less as Suppliers are ready to help and arranging emulsification units for mutual benefits. Indian market is now opened for multinational suppliers and is a worth investment for both. The operating cost is also less comparative to Neutral Sizing.

Besides cost ASA sizing gives many benefits to the paper makers in terms of quality and cleanliness. As fewer chemicals are required, the system remains cleaned and handling, storing cost reduced. In the long run it is always beneficial by converting to ASA sizing. Initially one may face some problems and production loss, but a strong determination and efforts on analyzing and optimizing the things pays a lot.

Acknowledgement:

The authors are grateful to the management of Ballarpur Industries Ltd, unit-Sewa for giving permission to publish this paper. They are also thankful to the R&D, QC, Stock preparation & Paper machine staff for their contribution in monitoring & operating the trial. Special thanks to Shri Sudhir Panda for monitoring the wet-end parameters.

REFERENCE

1. Stan Jenkins, Paperex 2007, "Recent developments and Trends in ASA Sizing".
2. Mishra. A. K. etal, Paperex 2007, "ASA Sizing: A Step closer to globalization".
3. Stan Jenkins, IPPTA, Vol-19, No-4, "Keynote Address at IPPTA workshop on Wet-end Chemistry with special emphasis on Neutral / Alkaline Sizing".
4. Willam E. Scot, "Principles of Wet End chemistry".
5. Naithani A.K. et al, IPPTA, Vol-19, No-4, "Developments in papermaking using Alkaline Sizing in Mix Agro Furnish A Mill experience".
6. Awate B.P. et al, IPPTA, Vol-19, No-4, "Alkaline Sizing for Fine Paper: An Experience".