

IMPROVING THE RECYCLED PULP YIELD BY RETAINING INHERENT STARCH OF WASTE PAPER

STARCH PRESERVATION AND
PASSIVATION.

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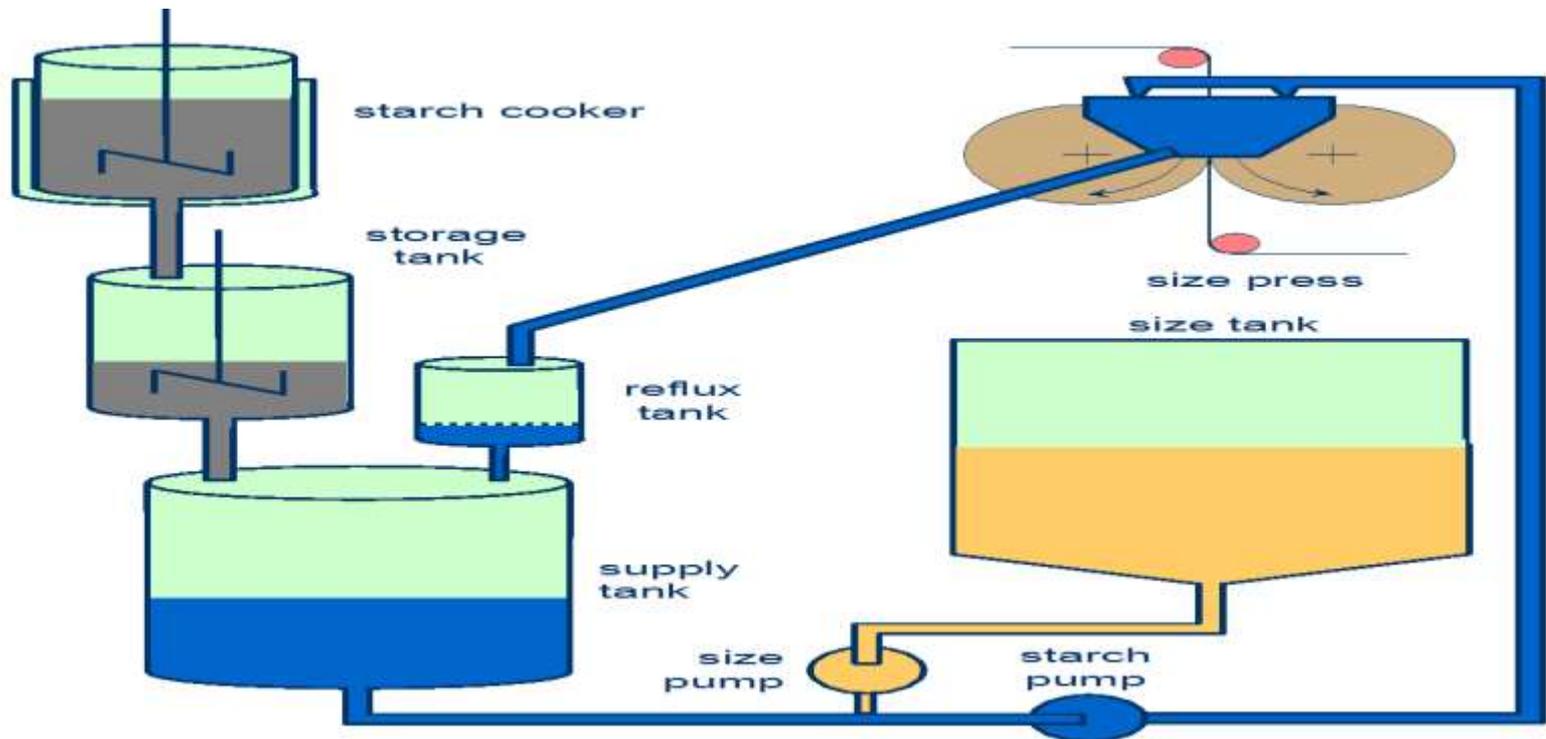


INTRODUCTION:

- NATIVE OR MODIFIED STARCH USED IN SIZE PRESS FOR SURFACE SIZING.
- CATIONIC STARCH IS USED IN WET END FOR PAPER STRENGTH.
- WET END OR SIZE PRESS ADDITIONS BOTH IMPART STRENGTH AND B.F OF PAPER.
- SURFACE ADDITION BRING SMOOTHNESS AND SUPPORT SURFACE SIZE CHEMICAL
- STARCH/DEXTRIN USED IN CORRUGATION PROCESS OF BOX MAKING AS GUM.

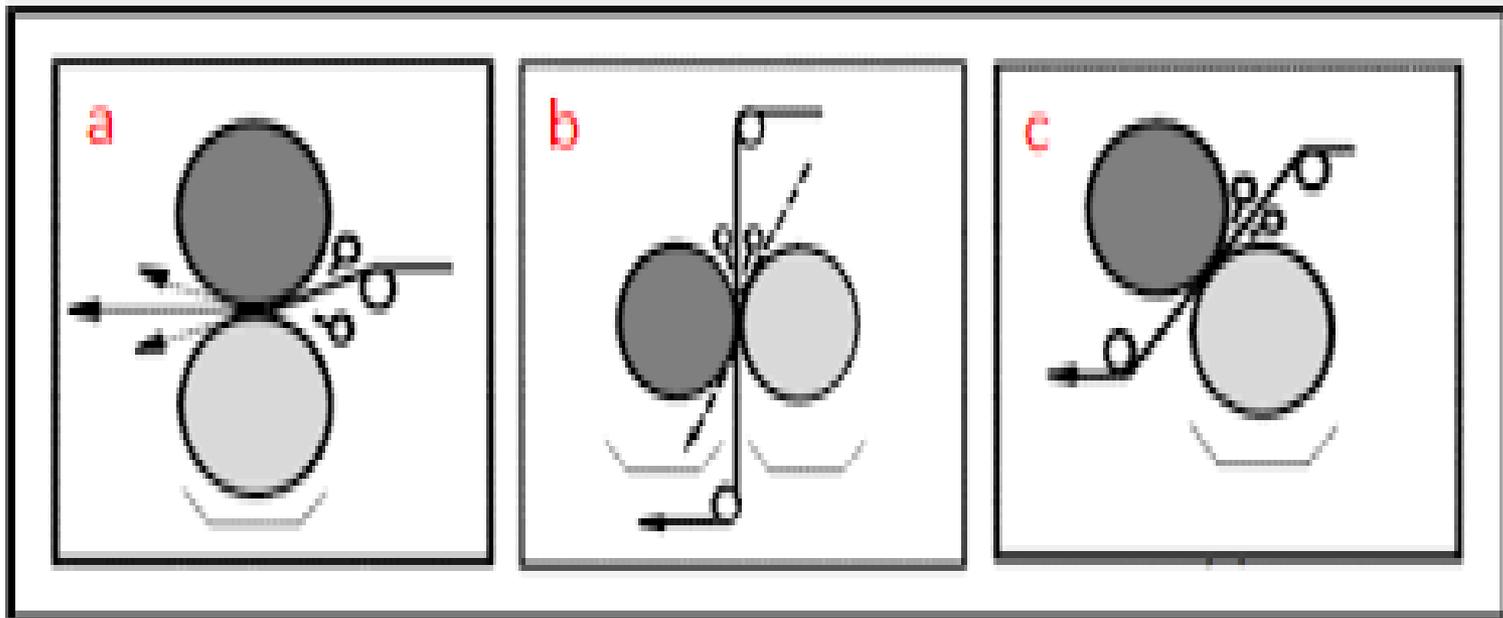
SIZE PRESS APPLICATION OF STARCH

- ABOUT 4% TO 10% IS USED DEPENDING ON KRAFT PAPER QUALITY.



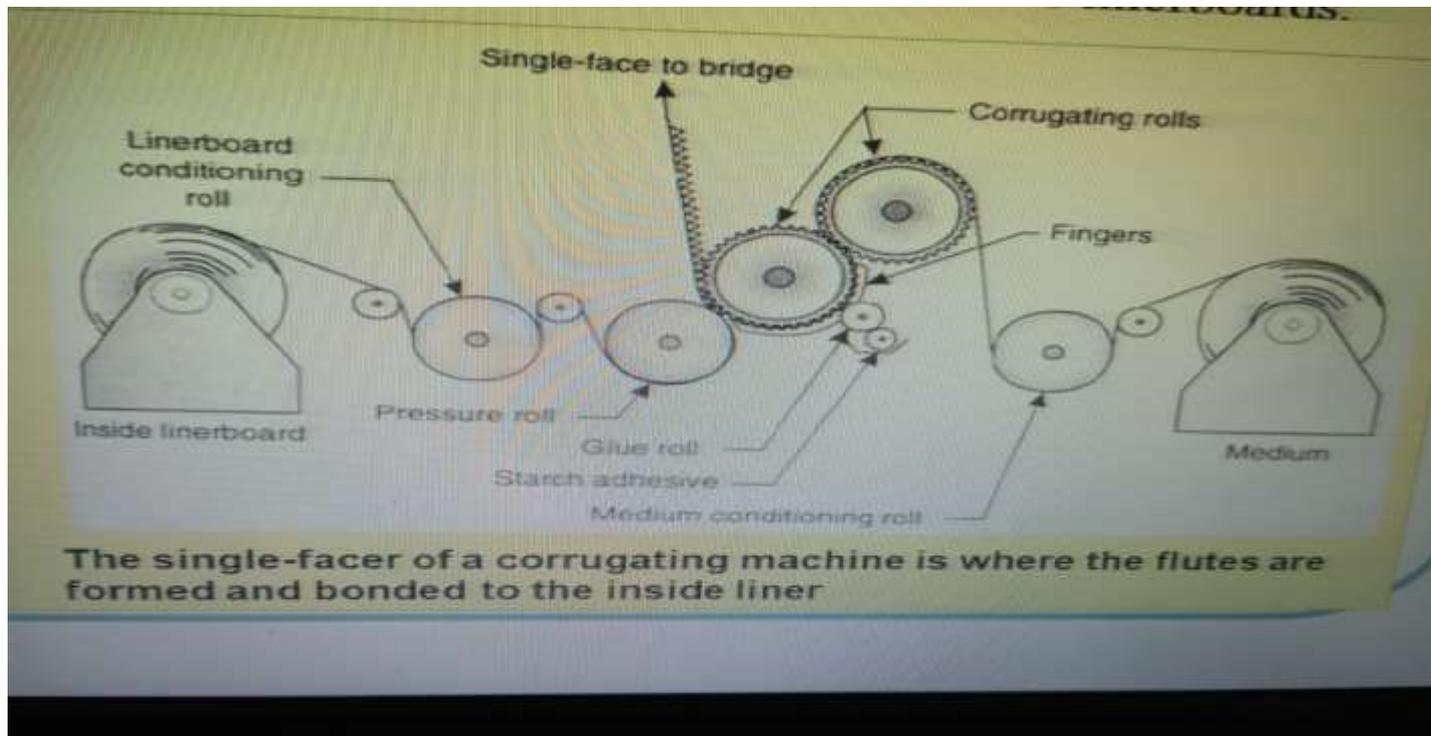
PAPER MACHINE SIZE PRESS

SIZE PRESS MODES, VERTICAL, HORIZONTAL, ANGLED



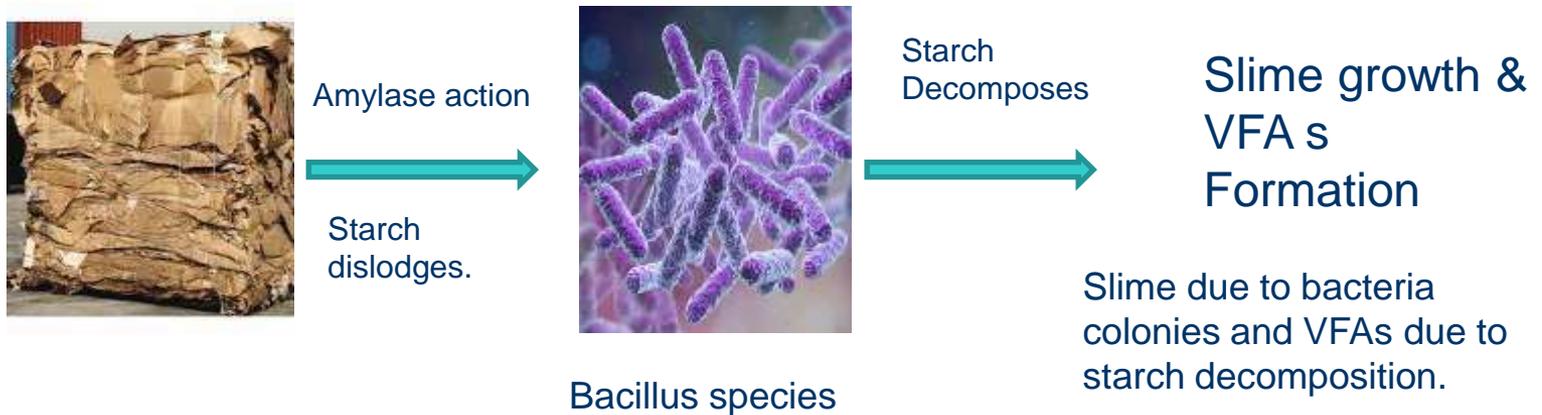
CORRUGATION BOARD MAKING

- FLUTE IS JOINTED WITH LINER KRAFT (2-4% Starch/Dextrin added)



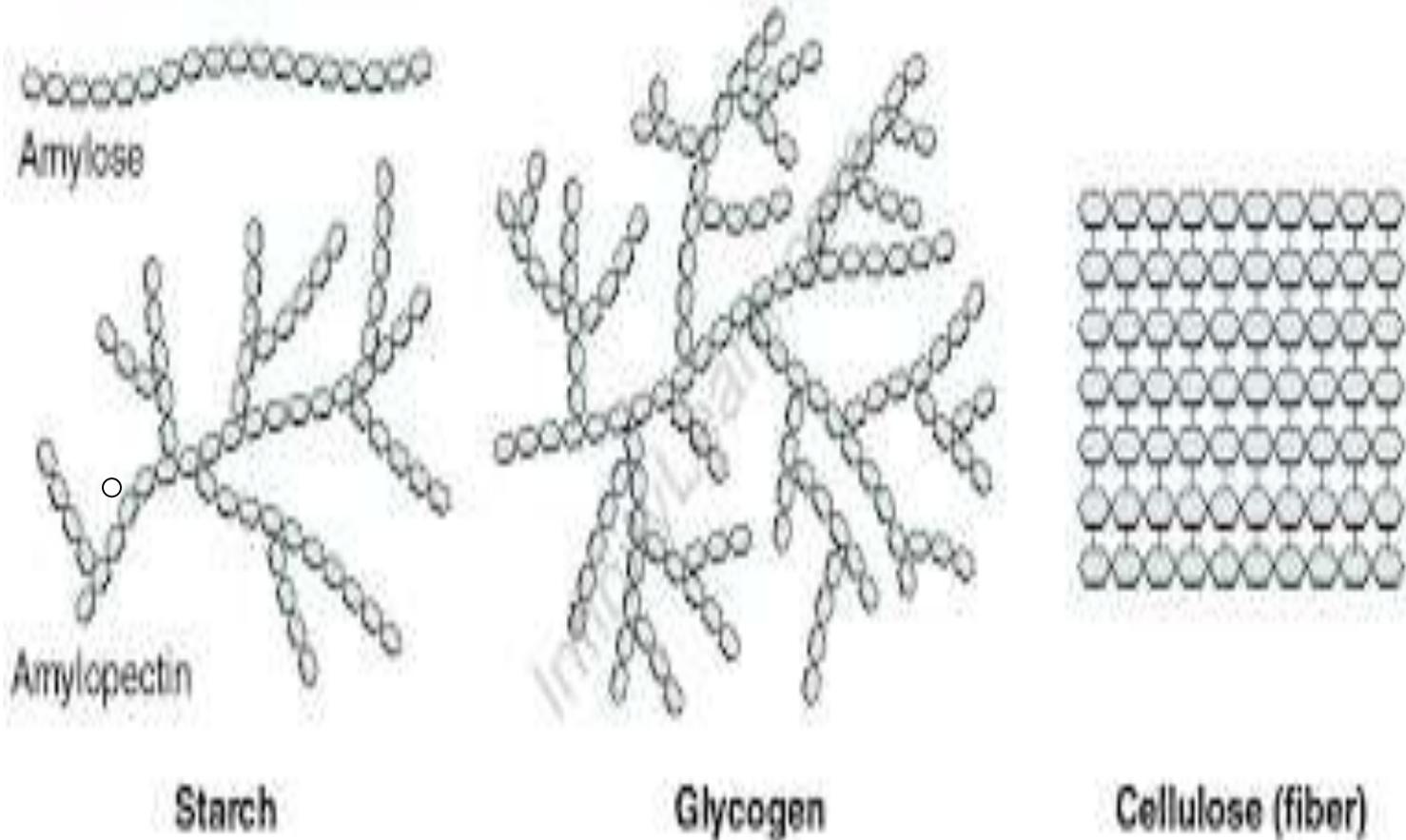
STARCH ENTRY - DECOMPOSITION IN PULPING

WASTE PAPER BALES ARE COMPOSITE OF LINER KRAFT, CORRUGATION BOXES ALL. THEY DO HAVE STARCH AND IT IS DISLODGED AND DECOMPOSED BY BACTERIA. MOSTLY PSEUDOMONAS AND BACILLUS SPECIES.

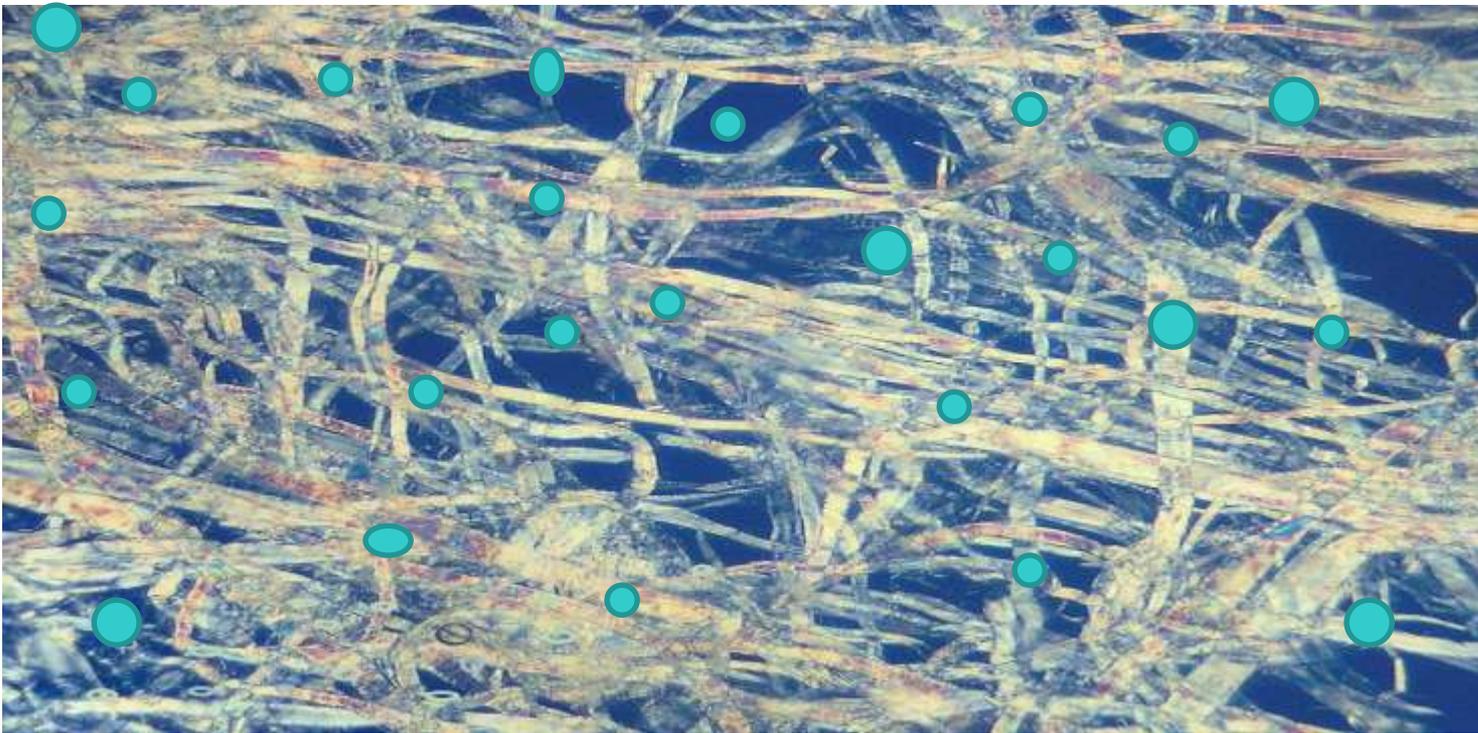


STARCH AND CELLULOSE TOGETHERNESS.

Basically they are polymer of glucose units linked In different way



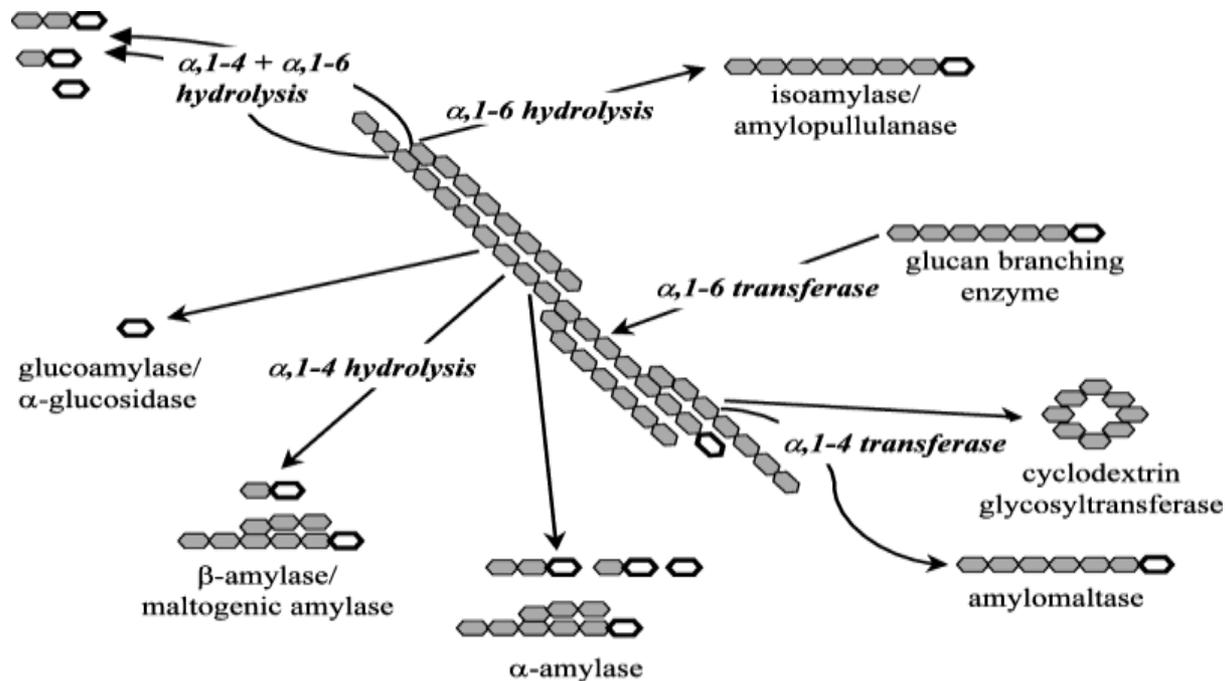
STARCH IN KRAFT PULP SLURRY



Starch embedded with Pulp stock

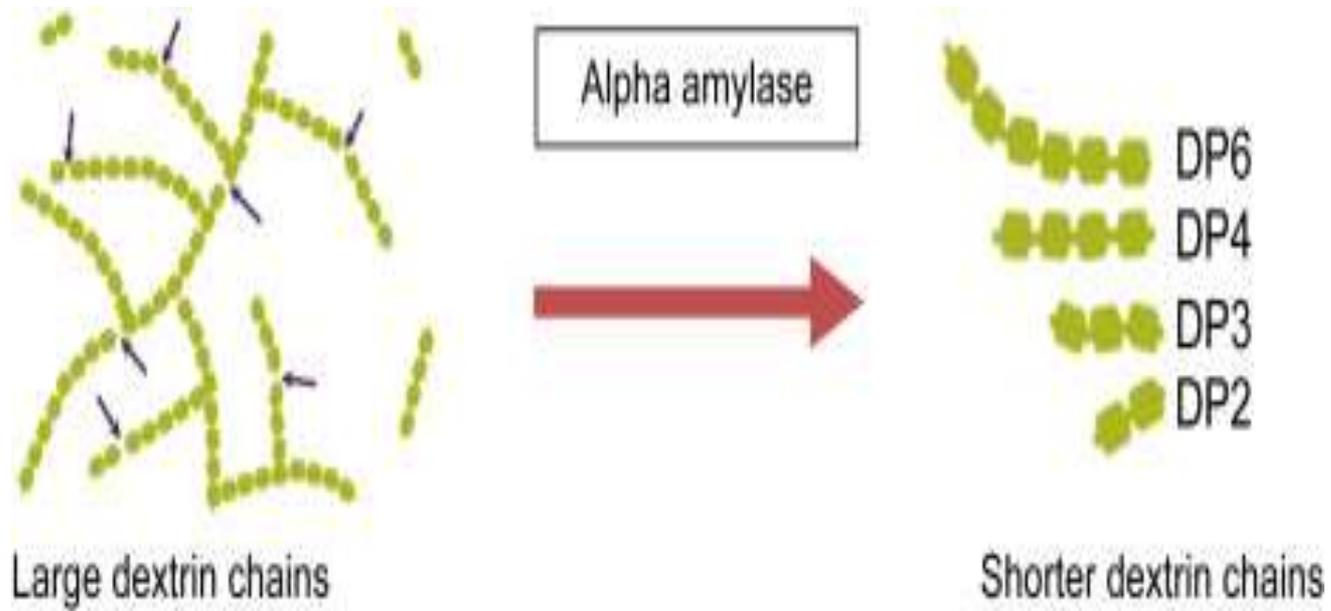
STARCH DEBONDING BY EXO-ENZYMES FROM BACTERIAL SPECIES IN PULP SYSTEMS.

Mainly Alpha and Beta Amylases of exo-enzymes play the role.



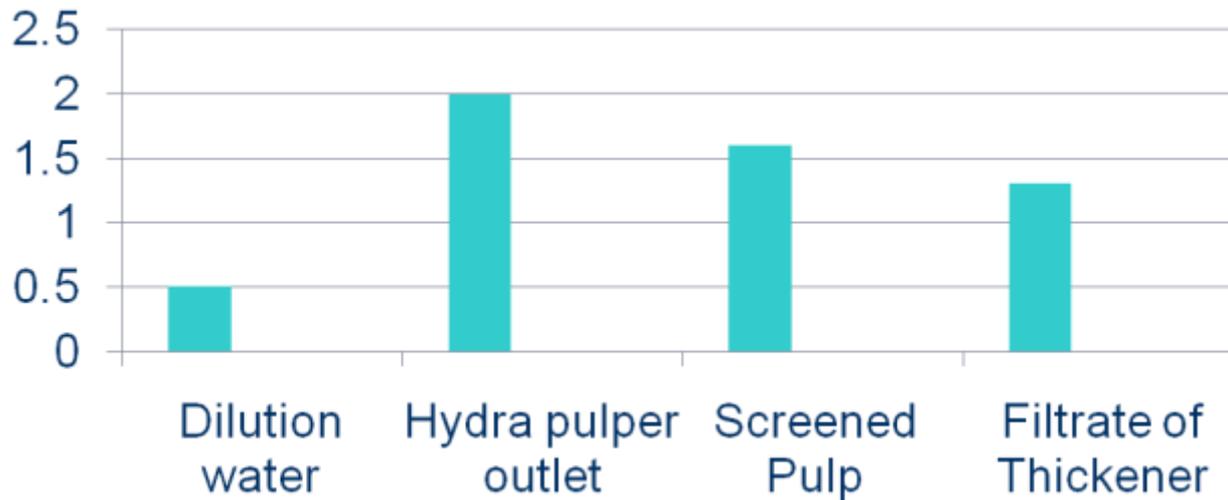
DEXTRIN DECOMPOSITION BY AMYLASE ACTIVITY

- DEXTRIN OF CORRUGATION STOCK DECOMPOSITION.



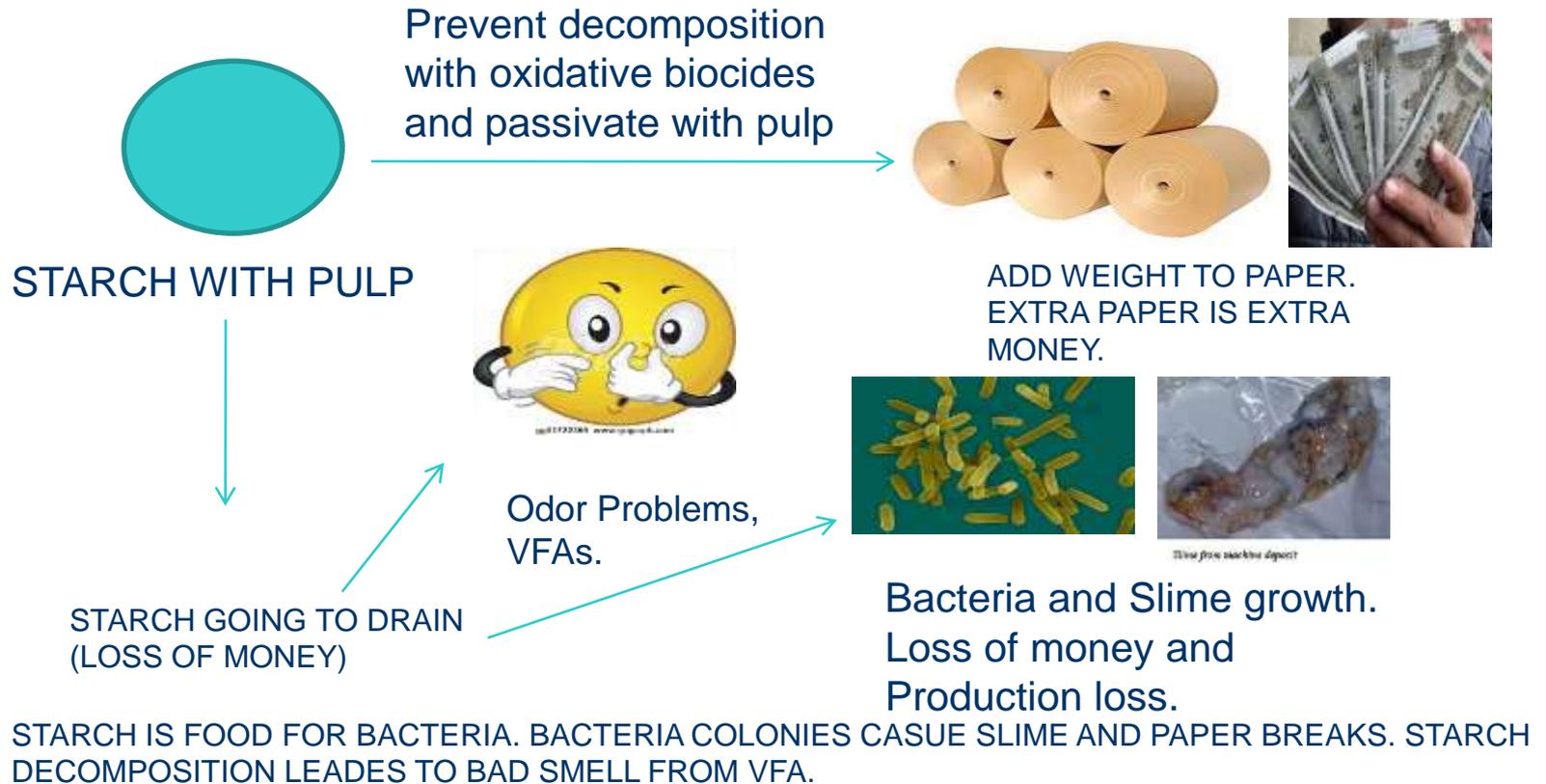
AMOUNT OF STARCH IN PULP IN STAGES

Starch content Grams per Liter in OCC Process stages



ENZYMATIC TEST METHOD

PASSIVATION WITH PULP AND PREVENTION OF DECOMPOSITION IS ONLY THE CURE.



SIMPLE OXIDATIVE BIOCIDES USAGE - SOLUTION

SODIUM CHLORATE OR
POTASSIUM CHLORATE } + Oxalic acid/Citric acid →

GENERATE ADEQUATE CHLORINE DIOXIDE IN PPM TO
KILL BACTERIA AND NEUTRALISE EXO-AMYLASES.

BENEFIT: SYSTEM BECOME IMMUNE FOR STARCH
DEGRADING BACTERIAL GROWTH.

SIMPLE OXIDATIVE BIOCIDES USAGE - SOLUTION

Sodium Hypo Chlorate + Caustic + Liquor Ammonia 
Gives Chloramines in M/c back water and circulation in ppm
in required level.

Hydrogen Peroxide + Silver Nitrate + Isopropyl alcohol 
Spray addition as supporting layer over web and paper.

**BENEFIT: BACK WATER SYSTEM AND PAPER WEB/PAPER
BECOME IMMUNE FOR STARCH DEGRADATION BY BACTERIA.**

CASE STUDIES

- TWO KRAFT PAPER MILLS WERE SELECTED FOR CONDUCTING ABOVE MENTIONED WAY OF TRIALS.
- BOTH MILLS MAKE MG KRAFT PAPER FOR PACKAGING BAGS.
- AFTER SUCCESSFUL TRIALS MILLS FOUND COMFORTABLE WITH REDUCED COD LEVELS IN WATER
- MILLS FOUND NO ODOUR PROBLEMS IN MILL WATER AND FINISHED PRODUCT
- MILLS HAPPY OF EXTENDED BOILOUT PERIODS . NO SLIME PROBLEMS. PRODUCTION IS GOOD. NO MARKET COMPLAINTS OF ODOUR FROM PAPER.

PROCESS EVALUATION.

- STOICHIOMETRIC ADDITIONS OF SODIUM CHLORATE(80%) AND CITRIC ACID GENERATE PRECISE LEVEL OF ClO_2 PER LITRE IN PPM .
- RESIDUAL CHLORINE DIOXIDE CAN BE DETERMINED BY TITRATION.
- CHLORINE/CHLORAMINES CAN BE DETERMINED IN PROCESS CIRCULATION WATER WITH CHLORINE STRIPS AS PPM.
- COLOR STRIPS WILL BE AVAILABLE FOR MONOCHLORAMINE IN PPM

PROCESS EVALUATION

- HYDROGEN PEROXIDE CONCENTRATION CAN BE DETERMINED BY TITRATION METHODS OF IT'S STRENGTH AND ASSAY ON LABEL.
- PRECISE DOSAGE OF SILVER ION WITH HYDROGEN PEROXIDE AND ISOPROPYL ALCOHOL CAN BE BALANCED.
- SPRAY BAR ADDITION AT PRESS PART, SIZE PRESS AND SPRAYING AT REWINDERS IS POSSIBLE OPTIONS.

TANGENTIAL BENEFITS OF THIS.

- PASSIVATION OF STARCH/ADDING WEIGHT AND VALUE TO PRODUCTION
- LESS BOD/COD VALUES IN PROCESS WATERS
- NO ODOR PROBMES DUE TO PREVENTION OF STARCH DECOMPOSITION
- NO BACTERIAL GROWTH DUE TO CIO2 TREATMENT FROM PULPER STAGE AND CHLORAMINES IN CIRCULATION WATER. MANY SIDE BENEFITS.
- NO SLIME GROWTH AND NO SLIME BREAKS. ADDS PRODUCTION.
- NO MARKET COMPLAINTS OF ODOR FOR PACKAGING. QUALITY BENEFIT.
- ATLEAST 30 KG STARCH RECOVERY PER TON GIVE Rs.60000 PER DAY/100TPD.
- MY SINCERE THANKS TO MY COLLABORATORS AND PROMOTERS PARTICULARLY SHREE BALAJI PERFORMANCE CHEMICALS , AND PAPER MILLS PEOPLE FOR SPONSORING THIS.



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*Thank
you*

