

# Troubleshooting Corrugating adhesive



# Adhesive Characteristics Troubleshooting

## Solids

Too high

- Water meter reading faulty
- Too much starch in the recipe

Too low

- Water meter reading faulty
- Insufficient starch in the recipe.
- To some degree, low solids can be attributed to presence of bacteria in the system

# Adhesive Characteristics Troubleshooting

## Gel Temperature Too high

- There may not be enough heat to gelatinize all the starch granules.

This will result in:

- A white glue line
- Poor bonding
- Low machine speeds particularly with DWB
- Dry end operators will notice Wet OR Soft board coming off the corrugator.

## Causes

- Not enough caustic in the batch
- New caustic supply – not the same strength
- Dry caustic has been allowed to stand in open and picks up water from the air.
- Liquid caustic (45 – 50%). Precipitation has occurred.

# Adhesive Characteristics Troubleshooting

## Gel Temperature Too low

- Adhesive will gel before it has a chance to penetrate into the paper
- Result in brittle board
- Dry board
- Raspy-feeling glue lines
- Cracking board
- Severe gelling in the pans

## Causes

- Too much caustic in the batch
- Starch solids decreased without decreasing caustic
- Highly concentrated liquid caustic

# Adhesive Characteristics Troubleshooting

## Viscosity Too high

- At completion of batch
  - Not enough volume of water
  - Batch did not finish to correct volume
  - Too much starch in the primary stage
  - Agitation period not long enough
  - Viscosity cup orifice may be blocked thus giving false readings.
- Increase in storage tanks
  - Agitators in tanks not turned on
  - Caustic content too high causing raw starch to swell.
- Increase overnight or weekends
  - Ambient temperature drops and there is no agitation.

# Adhesive Characteristics Troubleshooting

## Viscosity Too low

- At completion of batch
  - Too much water added
  - Not enough starch in primary stage
  - Agitation period too long
- Decrease in storage tank during run
  - Dirty lines
  - Pans cleanup water allowed to return to storage
  - Water being accidentally added to sump tank
  - Steam leaks at around the S/F allow condensate to drip in starch pans
- Decrease overnight or weekends
  - Bacteria action
  - Use of flexo wash up or process water requires additional preservative.

# Viscosity Loss (Other causes)

- Temperature
- Shear
- Time
- Bacteria
- Excess water
- Primary starch
- Resin

# VISCOSITY LOSS (temperature)

NB: As the temperature of the adhesive increases (gets more hot); the viscosity of the adhesive decreases (THINNER) and visa versa.



# Temperature – Viscosity Correction Table

32°C	33°C	34°C	36°C	37°C	38°C	39°C	40°C	41°C	42°C	43°C
42	38	34	31	28	25	23	20	18	17	15
44	40	36	32	29	26	24	21	19	17	16
46	41	37	34	30	27	25	22	20	18	16
48	43	39	35	32	29	26	23	21	19	17
50	45	41	37	33	30	27	24	22	20	18
52	47	42	38	34	31	28	25	23	20	18
54	49	44	40	36	32	29	26	24	21	19
56	50	46	41	37	33	30	27	24	22	20
58	52	47	43	38	35	31	28	25	23	21
60	54	49	44	40	36	32	29	26	24	21
62	56	50	45	41	37	33	30	27	24	22
64	58	52	47	42	38	34	31	28	25	23
66	60	54	48	44	39	35	32	29	26	23
68	61	55	50	45	41	37	33	30	27	24

# VISCOSITY LOSS (bacteria)

Starch is attacked by bacteria breaking it into smaller fragments (dextrin's). These fragments dissolve in water, lowering the viscosity of the adhesive.

## Bacteria Source

- dirty storage tanks
- dirty lines
- recycled water
- air leaks

# Microbial Degradation (Prevention)

- Minimize the amount of adhesive stored for long periods of time
- Use a preservative during shut-down i.e. weekends and long holidays
- Clean complete system with TSP or HTH and bleach every six months

# VISCOSITY LOSS (excess water)

- Two sources
  - Excess water in the current formula
  - Unwanted source ( leaks )
- Excess water effects
  - dilute the adhesive
  - lower the solids
  - increases susceptibility to shear

# VISCOSITY LOSS (primary starch)

- Cook temperature too hot
- Not enough primary starch
- Excessive shear in the primary mix
  - agitation too long
  - pump over step

# VISCOSITY LOSS (resin relationship)

- A resin creates a chemical reaction when the adhesive is heated on the corrugator
- The result produces a water resistant bond. The degree of WR is related to the ratio of resin solids to starch.
- A batch with resin **MUST** be used as soon as possible e.g. within 8 hours.
- After that, the resin loses the ability to react with
- the starch and viscosity breakdown begins.

FOR MORE INFORMATION PLEASE  
CONTACT GODFREY MAMBA