# Additive for Corrugated Cardboard Glue

## **Liquid Borax**

DOR GROUP

# BORAX

## What is Borax?

**Naturally occurring compound found globally**

**Multiple uses including :**

- ✓ Detergents
- ✓ pH buffer
- ✓ Water softening
- ✓ Tackifier for starch and dextrin based adhesives

**Most common form is Powdered**

- ✓ Borax pentahydrate (5 mol) – most common
- ✓ Borax decahydrate (10 mol)

# BORAX

- ✓ **Borax as Tackifier**
- ✓ **Borax is added to Corrugated Board adhesives to increase the tack, the stickiness of the surface of the adhesive.**
- ✓ **Borax changes the starch polymer to a more highly branched chain polymer with higher molecular weight that improves the wet tack.**
- ✓ **Powder Borax has Safety and Handling issues.**

# POWDER BORAX

## SAFETY CONCERNS WITH POWDER BORAX

**Inhalation Hazard**

Within the context of REACH all boron compounds are classified as SVHC substances (Substances of Very High Concern)

**Lift Hazard**

Lifting 25 kg. bags from floor to hopper
Back injuries & complaints
Back Injury

**Cut Hazard**

Bags are opened with knives or cutting tools
Do all workers wear gloves?
Laceration

**Slip Hazard**

Borax dust on floor

Slip injuries

# POWDER BORAX

## MANUFACTURING CONCERNS WITH POWDER BORAX

- ✓ Prone to clumping in bags or chutes
- ✓ Batch consistency problems
- ✓ Powder Borax accounts for approx.
  - 70% of auto starch kitchen faults (augers & chutes)
  - 25% of starch kitchen maintenance costs

# POWDER BORAX

## Corrugator using Powder Borax Adhesive

- ✓ Adhesive sling at corrugator
- ✓ High adhesive consumption
- ✓ Machine down time for clean up

# LIQUID BORAX

## Corrugator using Liquid Borax Adhesive

- ✓ Increased adhesive efficiency
- ✓ Reduced adhesive sling at corrugator
- ✓ Reduced adhesive consumption
- ✓ More consistent starch formula
- ✓ Reduced Machine down time for clean up

Adhesive going where it is supposed to go ➔ on the flute tip, and not on the machine, floor, and flute valley

# LIQUID BORAX

## Easy integration into existing Adhesive preparation system

- ✓ Elimination of powder Borax hopper and screw conveyor
- ✓ Connection of liquid Borax to the metering pump and to the adhesive preparation vessel
- ✓ Minor adjustments to the PLC program

# LIQUID BORAX

| OUR PRODUCTS | LBBC | LB30 | |
|---|---|---|---|
| | | | |
| **Appearance** | Clear light to dark yellow liquid | Clear yellowish liquid | |
| **pH** | 7.2 – 7.8 | 7.0 – 8.5 | |
| **Viscosity (cP)** | 10 - 50 | 30 - 100 | |
| **Solids ( %)** | 50.0 – 55.0 | 60.0 – 70.0 | |
| **Specific gravity (gr/ml)** | 1.19 – 1.25 | 1.24 – 1.28 | |

# LIQUID BORAX

## BENEFITS OF LIQUID BORAX JUSTIFYING PRICE

- ✓ Same or very similar dosage as powder borax (0.3 to 0.4%)
- ✓ Easy integration into glue kitchen
- ✓ Elimination of Safety issues
- ✓ Reduced Maintenance cost at glue kitchen
- ✓ Consistent and stabilized adhesive formula
- ✓ Reduction of adhesive build up at corrugator

# THANK YOU