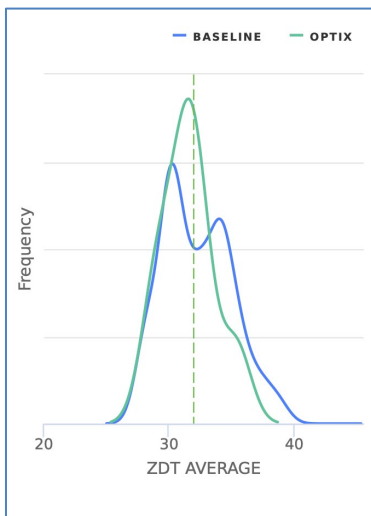


## RECORDED BENEFITS

- Complete GPAM / OPTIX program produced a 300% ROI
- Eliminated 3,000,000 kgs/yr. of wet-end starch providing a cleaner wet-end
- Removed starch cooker
- Simplified and stabilized chemical application and control strategy
- OPTIX effectively controlled ZDT during periods of full and curtailed production
- Improved ZDT target adherence reduced downgrades due to off quality



## AI-Driven Autonomous Control Aids Optimization of Sheet Strength (ZDT)

### OPTIX™ Applied Intelligence

#### Customer Challenge

A North American Virgin Folding Carton producer desired to improve internal bond sheet strength properties (ZDT) while also eliminating wet-end cationic starch.

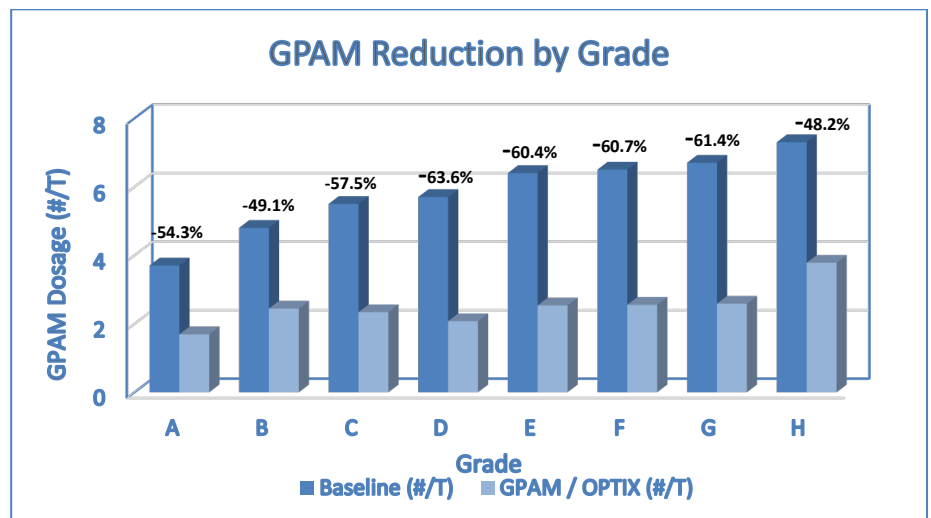
#### Recommended Solution

Solenis recommended a multi-tiered solution involving Solenis On-Site GPAM dry strength resin, refining trials, and implementation of OPTIX Applied Intelligence (AI).

OPTIX, a machine-learning, predictive analytics platform with autonomous control capabilities generates a virtual measure of ZDT strength value in real-time. Utilizing AI to make data-driven process adjustments, the GPAM strength chemistry is finely tuned to drive ZDT quality to target.

#### Results Achieved

1. Replaced incumbent GPAM supplier with Hercobond™ dry strength.
2. Modified GPAM application strategy to eliminate wet-end starch.
3. Reduced refining with improved strength properties associated with Solenis GPAM – improving machine drainage.
4. Over a twelve-month period of utilizing OPTIX autonomous control, the mill realized reduced ZDT quality variation and increased target quality adherence.
5. Overall GPAM dosage reduced by ~50% across all grades.



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