

ASSET INTEGRITY AND HIGH PERFORMANCE IN PULP AND PAPER

Each stage of the paper making process – debarking and chipping, grinding and refining, discoloration and bleaching, paper formation and manufacture – subjects machinery, equipment, and the whole facility to extremely harsh environments. Mainly, these assets may suffer from different modes of erosion-corrosion, abrasion, and chemical attack among others.

In order to ensure that the pulp and paper plants continuously meet their production goals with the highest performance possible, Belzona has designed a wide range of solutions that not only combat the challenges presented, but also provide protection from potential damage in the future.

Belzona's cold-applied systems have proven to help pulp and paper plants improve their operation by reducing downtime, eliminating replacements costs, and decreasing the risk of unscheduled shutdowns and startups. Belzona solutions for pulp and paper plants have shown reliability and success in the repair and protection of the machinery, equipment, and structures including but not limited to:



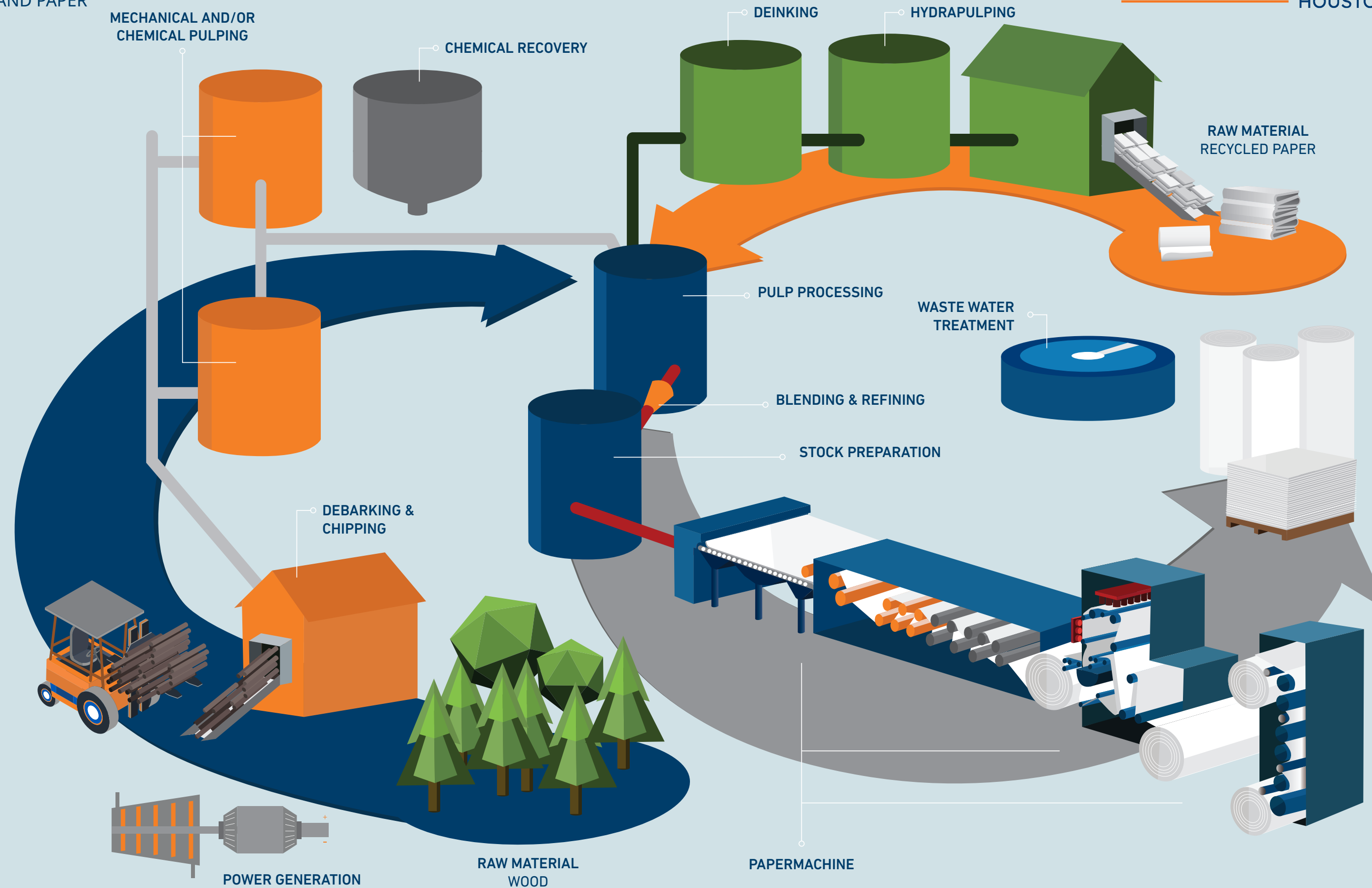
BELZONA®



- **SOLID HANDLING EQUIPMENT**
Debarkers, hoppers, screw conveyors, conveyor belts, drive rollers
- **FLUID HANDLING EQUIPMENT**
Pumps, pipework
- **MECHANICAL EQUIPMENT**
Shafts, dryer can journals, chipper discs
- **SECONDARY CONTAINMENT AREAS**
- **CONCRETE/STEEL STRUCTURES**

BELZONA®

HOUSTON, INC.



DEBARKING AND CHIPPING

TYPICAL PROBLEMS: Erosion-corrosion on log conveyor belts, hoppers, debarkers, chippers, pipework, pumps, flanges, shafts, and structural metal

POTENTIAL SOLUTIONS: Belzona 1000 series 100% solids paste- and fluid-grade materials for metal rebuilding and erosion-corrosion protection, Belzona 2000 series tough abrasion resistant polyurethanes for conveyor belt emergency repairs

MECHANICAL AND/OR CHEMICAL PULPING

TYPICAL PROBLEMS: Corrosion and chemical attack on delignification reactors (digesters) due to combination of aggressive chemicals and elevated temperature and pressure. Erosion-corrosion on grinders and crushers

POTENTIAL SOLUTIONS: Belzona 1000 series 100% solids paste- and fluid-grade materials for erosion-corrosion protection, Belzona 4000 and 5000 series for erosion-corrosion protection of secondary containment and fluid handling equipment

HYDRAPULPING

TYPICAL PROBLEMS: Erosion-corrosion on agitators, hydrapulpers, deflakers, holding chests and associated rotating equipment

POTENTIAL SOLUTIONS: Belzona 1000 and 5000 series paste- and fluid-grade materials for erosion-corrosion protection of surfaces under immersion

DEINKING

TYPICAL PROBLEMS: Corrosion and moderate erosion on flocculators, settlers, pumps, agitators, and pipework due to the combination of chemical additives and elevated temperature

POTENTIAL SOLUTIONS: Belzona 1000 and 5000 series paste- and fluid-grade materials for erosion-corrosion protection

BLENDING & REFINING

TYPICAL PROBLEMS: Chemical attack and severe erosion on blend chests and refiners due to the addition of various chemicals

POTENTIAL SOLUTIONS: Belzona 1000, 4000, and 5000 series paste- and fluid-grade materials for erosion-corrosion protection

PULP PROCESSING

TYPICAL PROBLEMS: Chemical attack, severe erosion, and moderate corrosion on pulp washers, deknotters, thickeners, centrifugal cleaners, screens, wash pumps, extraction fans and cleaners, rotary vacuum washers, and deflakers among others

POTENTIAL SOLUTIONS: Belzona 1000, 4000, 5000, 7000 paste- and fluid-grade materials for erosion-corrosion protection

STOCK PREPARATION

TYPICAL PROBLEMS: Severe erosion-corrosion on hydrapulpers, repulpers, deflakers, refiners, blend and machine chests due to addition of various chemicals

POTENTIAL SOLUTIONS: Belzona 1000, 4000, and 5000 paste- and fluid-grade materials for erosion-corrosion protection

PAPERMACHINE

TYPICAL PROBLEMS: Moderate to severe erosion-corrosion on pressurized headboxes, shafts, rolls, pits, dryers, calenders, floors, and structural metal

POTENTIAL SOLUTIONS: Belzona 1000, 4000, 5000, 7000 series paste- and fluid-grade materials for erosion-corrosion protection and equipment alignment

POWER GENERATION

TYPICAL PROBLEMS: Mostly corrosion problems related to elevated pressure and temperature on boilers, steam turbines, heat exchangers, and pipework

POTENTIAL SOLUTIONS: Belzona 1000 and 5000 series paste- and fluid-grade materials for corrosion protection

CHEMICAL RECOVERY

TYPICAL PROBLEMS: Chemical attack and corrosion due to both thermal and chemical operations on evaporators, recovery boilers, pumps, heat exchangers, tanks, and clarifiers among others

POTENTIAL SOLUTIONS: Belzona 1000, 4000, and 5000 series paste- and fluid-grade materials for corrosion protection

WASTE WATER TREATMENT

TYPICAL PROBLEMS: Erosion-corrosion on sedimentation and flotation clarifiers, aeration tanks, pumps, and centrifuges

POTENTIAL SOLUTIONS: Belzona 1000, 4000, and 5000 series paste- and fluid-grade materials for corrosion protection

This process flow chart of a typical papermaking facility is designed based upon data retrieved from various sources. It is to be used as general guidance only. It describes the most common repair and maintenance problems found in pulp and paper processing together with Belzona solutions which could potentially help mitigate such problems. It does not aim to supersede any drafted process flow charts in use at these plants. It is strongly recommended that each user of this guide contact the local Belzona representative to discuss the specific needs and operation conditions of their papermaking facility.