EXECUTIVE SUMMARY

The Automatic Handling Core Joiner is a fully automatic system for gluing recycled cores into new cores.

Every year the paper industry uses millions of cardboard and paper cores during the papermaking process. These cardboard tubes come in all different sizes and of different grades. In a typical parent core handling system for the Tissue Industry, these cores can weigh in at 100 pounds with a 16-inch diameter, each of these industrial-strength cardboard cylinders can carry a parent roll of paper up to 30 feet in circumference. Paper manufacturers reuse these cores repeatedly to avoid the high costs of disposal and replacement. Traditional methods of crushing, repulping, making board and cores are costly.

Core Cleaning & Broke Handling
Traditionally core handling systems avoid salvaging these degraded cores, and operators discard damaged cores when they are detected. To avoid damaging valuable machines by exposing them to the rigid core, manufacturers stop short of using the entire spool. This sizable “spent” left on the core can weigh anywhere from 200 to 300 pounds and is removed for recycling.

Core cleaning, roll slabbing and broke management are the automated processes of removing spent or waste material from the core and getting that material safely and efficiently back into the pulper. The purpose of this article is not to describe those slabbing paper processes or core recycling by cutting down spending, but to briefly describe the core recycling by core joining.

Core Joining
Core Joining, Core Recycling, Core Splicing or Core Gluing are all similar terms to describe the process of removing the degraded or damaged portions of the paper cores and gluing or joining the remaining quality sections of the core back together. In many cases, the glued joints are stronger than the original when placed back into production. Deformed and damage core ends are just cut off, and the remaining healthy parts are joined together resulting in a quality core at a reduced cost.

Custom System Layout
This specific core handling system shown is designed to automatically take deformed and damaged cores from core bins using a core handling apparatus. However, depending on the system design, the loading of the core joiner can be done manually, automatically via conveyor, overhead, gantry robot, or overhead buffer crane. As with the infeed of the system, the outfeed of the system can be customized to meet the space constraints of the mill.

Why Automatic Handling?
Service oriented culture of Innovation and Collaboration.
Full Service Automation Company, Vertically Integrated
Designed, Manufactured, and Supported in the USA by over 130 U.S. employees
Over 140,000 sq ft of manufacturing and assembly space, to design, build and runoff custom systems before they ship.
World-wide installations since 1972
THE PROCESS

Although the Automatic Handling Core Joiner can work with multiple diameters of cores, the process of core joining is consistent.

- Core A is loaded into Core Joiner
- Core A leading deformed end is cutoff
- Core A trailing deformed end is cutoff and machined to a female cone
- Core B is loaded into Core Joiner
- Core B leading end is machined to male cone
- Adhesive is applied to Core B
- Core A and Core B are pressed together
- Cutting the new core to desired length
- Restart process using new core drop

The system also connects to machines upstream and downstream to help ensure uninterrupted production. The converting process that turns the paper into the final product happens upstream from the core cleaner and must operate continuously to ensure production keeps up with demand.

To quickly connect multiple machines in the process, Automatic Handling uses the Rockwell Automation controls platform and implements an Allen-Bradley® GuardLogix® integrated safety system, which allows for safety and standard control on a single platform.

Paper Mill Core Recycling

Recycling Cores saves energy, helps keep materials out of landfills and incinerators, and provides new cores for the production of new parent rolls. When waste cannot be prevented, recycling is the next best option.

FAQs

Q - What range of core diameters can be cut?
A - 8" to 18" Inner Diameter

Q - What lengths of core can be cut?
A - Minimum output length for recycled core lengths 32" to 140" maximum

Q - Is the adhesive okay for our facility?
A - The glue is non-caustic

Q - How many rolls can be fixed from a single roll?
A - There is not a set number, however a 2" minimum is removed from core ends to ensure core accuracy

Q - How loud is the system?
A - At peak volume the core joiner system is currently at or below 80db

Q - How many rolls can be fixed in an hour?
A - The system shown above is designed for 30 rolls per hour.

Q - What type of safety and controls does this system use?
A - Allen-Bradley® GuardLogix® safety system with Allen-Bradley POINT Guard I/O™ modules communicate directly with GuardLogix controllers using CIP™ safety over EtherNet/IP™

Q - What waste stream options are available?
A - Shredding and briquetting options are available

BENEFITS

Recycled Core Durability
- Recycled Cores maintain their geometry (length, ID, and wall thickness)
- Recycled Cores maintain their strength (crush and torque testing)
- Recycled Cores do not have damaged ends and maintain their ability to properly chuck