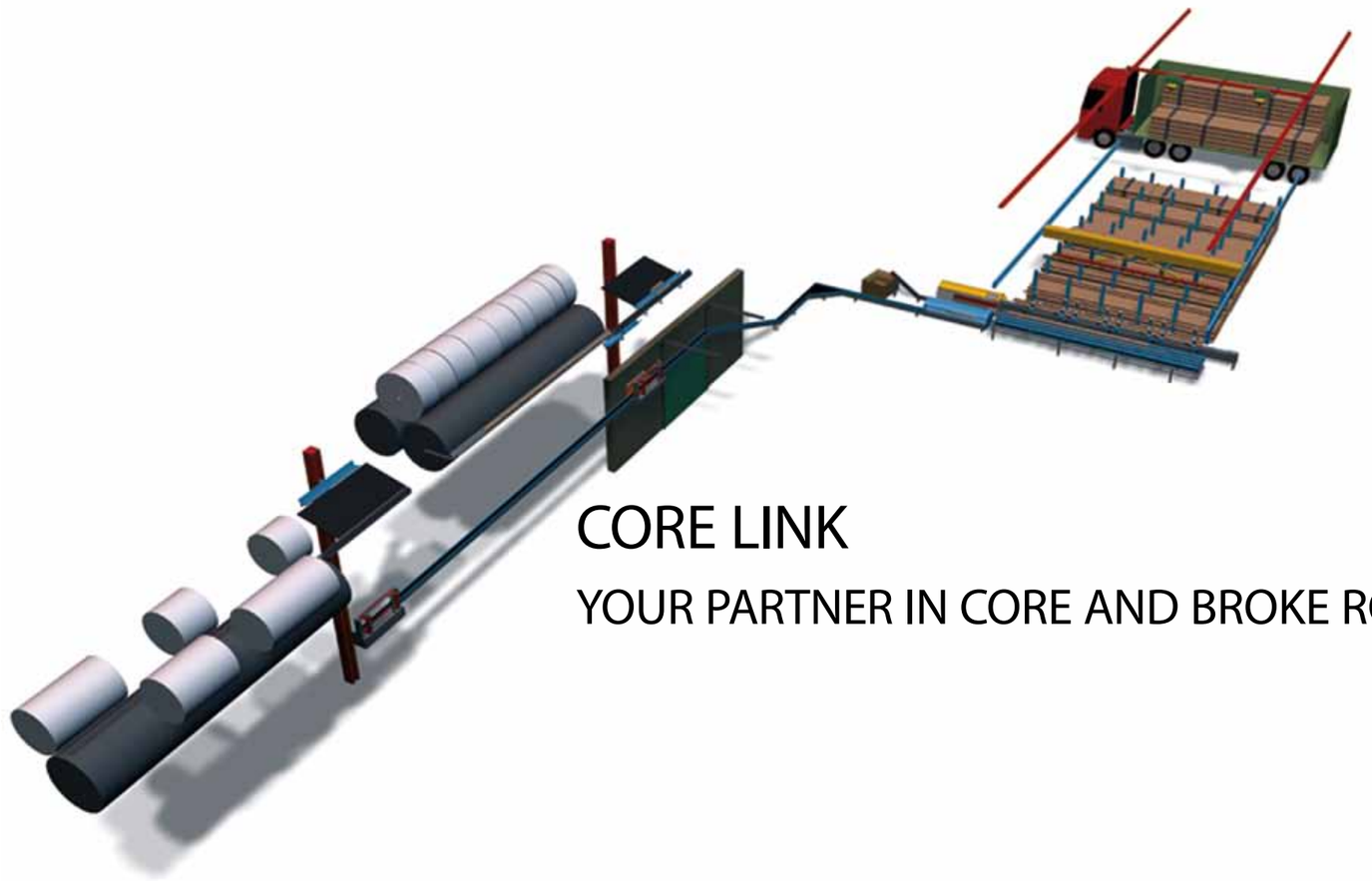

CORE LINK

YOUR PARTNER IN CORE AND BROKE ROLL HANDLING

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MEMBER OF MUSTAD INTERNATIONAL GROUP

Global Partner

MEMBER OF MUSTAD INTERNATIONAL GROUP SINCE 1986

In the Paper and Converting Industry

Core Link is an international company with headquarter in Sweden and complete in-house competence.

Since the 1970s Core Link has consolidated its position in the paper and converting industry as a global partner in providing cost-efficient and productive solutions for core and broke roll handling.

Through our worldwide market organization we deliver equipment suitable for all paper mills and all paper grades. Hundreds of paper mills in more than 50 countries have installed our core and broke roll handling systems.

The innovative Core Link technology results in increased productivity and reduced waste in the industry.

The close teamwork with our customers combined with our extensive product range enable us to design custom engineered solutions, both for simple manual machines and for entire systems for fully automatic core and broke roll handling. Our know-how covers the entire process and offers the most cost-efficient technology.

Core Link is a supplier of complete package solutions. Since the start substantial resources have been and are still being invested in R&D of new products, methods and processes. Furthermore, our business strategy for the future is clear; we will continue our extensive investments to further improve reliability, logistics, ergonomics, environmental sustainability and cost effectiveness.

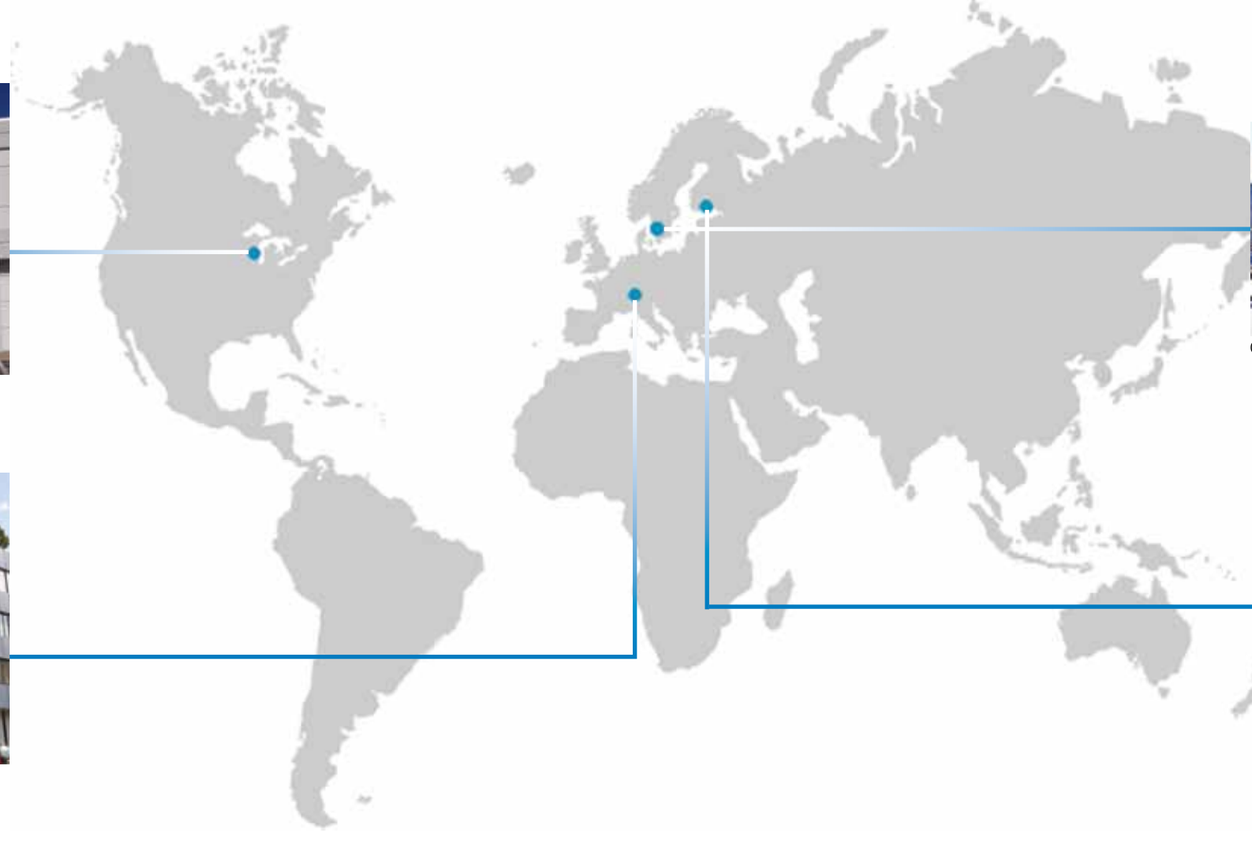
Quality
Core Link has been ISO certified since 1997.

Milestones of Core Link Innovations

1965	Patented cooling roll for the converting industry
1972	New type of core cutter delivered
1979	The first fully automatic core handling system with direct infeed to the winder delivered
1980	Introduction of the patented core stripper for butt rolls
1985	The first fully automatic plugger delivered
1987	The first fully automatic metal end capper (patented) delivered
1999	Introduction of the patented roll cutter for broke rolls
2002	Introduction of efficient core splicing technology with optimum strength of the joint, patented
2004	The first core grooving system delivered
2007	CLICS ; Multi roll packaging solution using folded inner cores, patented
2009	Installation of fully automatic system for reusable cores
2010	Delivery of a new de-wrapping technology, patent pending

Core Link Inc, Wisconsin, USA


Core Link AG, Baar, Switzerland



HEADQUARTER


Core Link AB, Falkenberg, Sweden


Core Link OY, Loviisa, Finland

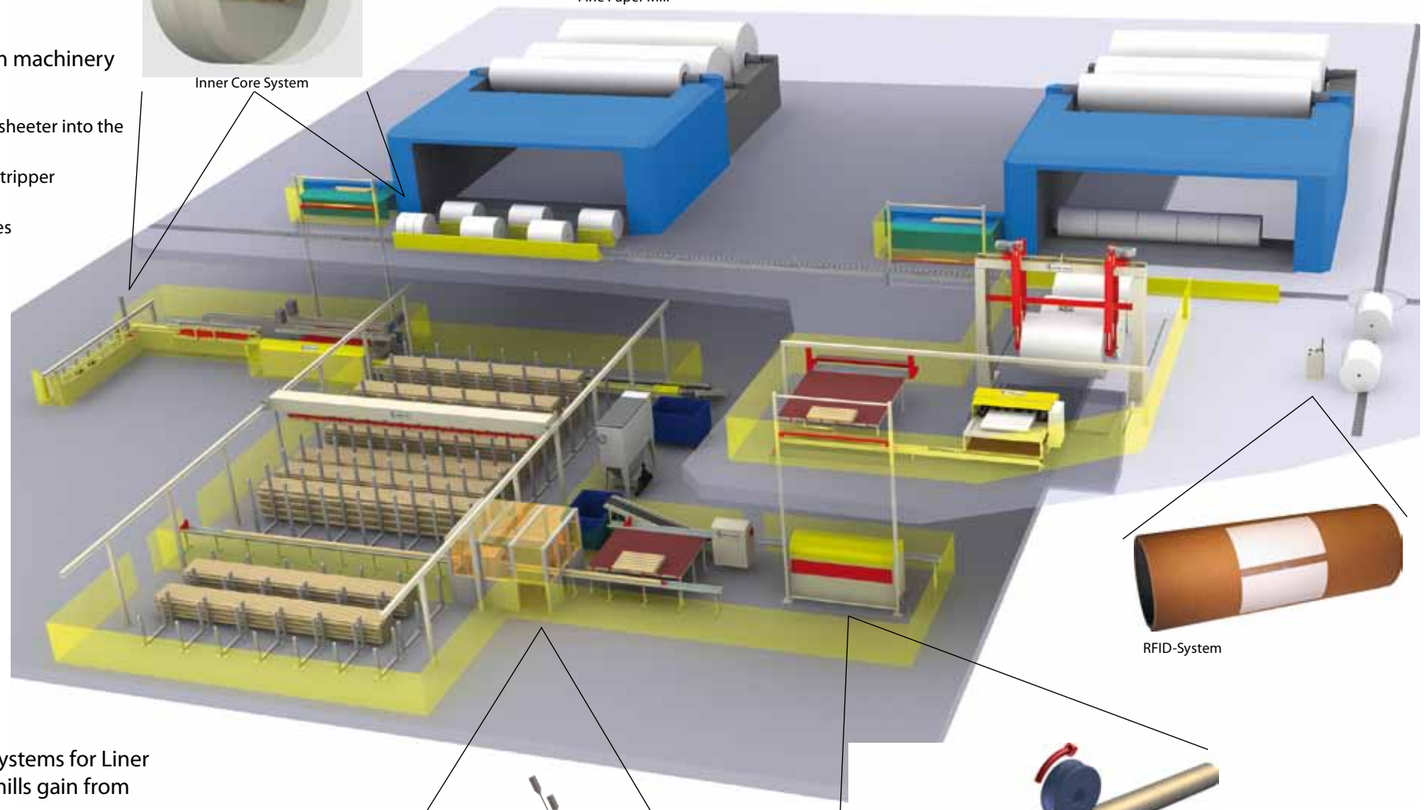
Core Link Supplies Fully Automatic Systems

- Adjusted to each Customer Segment

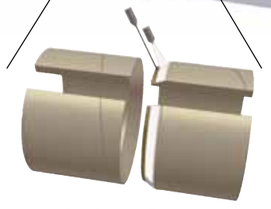
The development for Core Link equipment has gone from simple, semi-automatic systems to fully automatic core and broke roll handling systems. Core Link has developed standard concepts for the different segments within the paper industry. Core Link has also tailor made systems for mills operating in Converting, Printing and Metal- and Plastic film industry. Below some of the different customer segments are described as well as Core Links machinery and equipment suitable for each branch.

Inner Core System

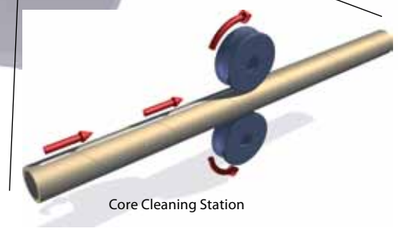
Example: Fully Automatic Core Handling System
- Fine Paper Mill



RFID-System



Core Splicing System



Core Cleaning Station

›› Fine Paper Mills

Fine Paper Mills benefits especially from machinery for core splicing, but also from:

- Robot system that picks butt rolls from the sheeter into the wagon loader at sheeting department
- Butt roll unloader at winder level to a core stripper
- Cueing of broke rolls before roll cutter
- Elevators for transportation of stripped cores between levels
- Core cleaning station
- Core splicing system
- Automatic core cutter
- Core groover
- RFID-system for core and reel tracking
- Inner core inserter
- Core transport system to winders
- De-wrapping equipment

›› Liner/Board Mills

Core Link has delivered core handling systems for Liner and Board Mills for many years. These mills gain from automatization of the core handling.

- Belt hoppers or core robot depending on core diameters
- Core cutter
- Core groover
- RFID-applicator for roll traceability
- Core transport system to winder
- Roll cutter
- Roll plugger/Plugger
- De-wrapping equipment

›› Core Manufactures

Core Manufactures need to handle the long, “wet” cores gently with a core robot before drying.

- Core robot before drying
- Lifting devices
- Cart loading
- Core loading
- Core cleaning station
- Core splicing
- RFID-system for core and reel tracking

›› Newsprint Paper Mills

Newsprint Paper Mills sometimes handle mixed core sets and have a great need for waste optimization.

- Core robot for mixed set
- Core cutter
- Manual core cutter at re-winder
- RFID-system for core and reel tracking
- Loading of cores of different dimensions to cart
- Core transport system to winders
- Automatic loading of queued rolls before roll cutter
- Roll cutter
- De-wrapping equipment

›› Tissue Paper Mills

Tissue Paper Mills benefit from a high automation level for butt roll handling and roll handling.

- Core robot and transport system for cores to tissue machine
- Auto carriers to deliver rolls to converting lines
- Auto carriers to deliver butt rolls to butt roll cutter infeed table
- Pick up robot for delivering rolls to the roll cutter
- Roll cutter and butt roll cutter
- Core cleaning unit for removing last paper layer
- Conveyor that transports the paper to a pulper
- Core checker
- Core loading device for loading cores into different carts
- RFID-system for core and reel tracking

›› Converting Plants

Liquid packaging or self adhesive label producers handle narrow and many cores and especially need automatic core handling and de-wrapping.

- Core robot for feeding cores to the core cutter
- Roll plugger
- Core cutter for mini sets - cutting of narrow cores
- Core transport system to slitter rewinders
- Semi-automatic broke roll cutter due to limited weight
- De-wrapping equipment

Core Link Assists in Controlling the Core Flow

Core Link has the required technical know-how and resources to assume full responsibility for all parts of the core handling, from shipment and unloading until the point when the core is delivered to winder. Minimal labour, orders received directly from mill system and high flexibility are some of the features of a fully automatic core handling system which make life easier for the mills. Together with the customer Core Link can create core flow solutions that lead to less production costs, higher productivity and reduced core waste.
Examples of Core Links core and roll logistic solutions are lifting devices for bundles, carts for handling shorter parent cores, robot systems, storage and mixing of different core dimensions/qualities including reusable cores and group packaging of rolls.

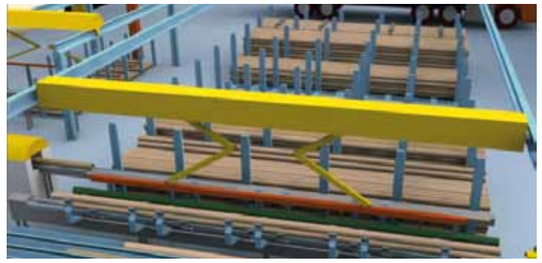
Parent Core Handling System

The solutions can include basic hopper tables to fully automatic core robots. Installations are customized to mill specifications and are easily expandable.

Lifting Device

For effective handling of packed or unpacked core bundles Core Link can supply different types of lifting devices.

Lifting Device



Core Robot

Pick-Up Robot Systems

These systems provide possibilities to store and re-use pulled-back long rest pieces when cutting mixed sets.

Belt Hopper

The core cutter can be equipped with one or more cost effective automatic belt hopper depending on the specific demands.

Hopper Tables

For less demanding applications there are different types of hoppers and hopper tables available.

Automated Core Cutting

The core cutter contributes to the record-setting mill productivity of today in combination with pick-up robot, automatic preparation stations and core transport systems. Core Link can offer cutters suitable for cutting in different material such as board, aluminium and plastic.

Core Links core cutting systems range from handling short cores (down to 10 mm for metal industry) to large diameter cores (above 400 mm).

Features of Core Link core cutters:

- No mismatched sets
- Consistent quality
- Minimized waste
- Maximal safety - improved working conditions

Automatic Core Cutter

Core Preparation

To optimize cost-savings, all core preparations can be automated. These stations are typically integrated into a core cutter system but can also be used as stand alone units. All systems are made to suit the specific mill requirements.

Examples of core preparations are:

plugging, grooving, reaming, bevelling, notching, capping, tape application, inner core inserter, tag applicator.

Plugged Core | Bevelled Core | Notched Core

Core Grooving Ensures Roll Quality

Some paper grades are challenging to wind in two drum winders, especially grades based on 100% recycled fibres.

Grooves in the core ends mate the cores together during winding which prevents the cores drifting out from the rotation axis.

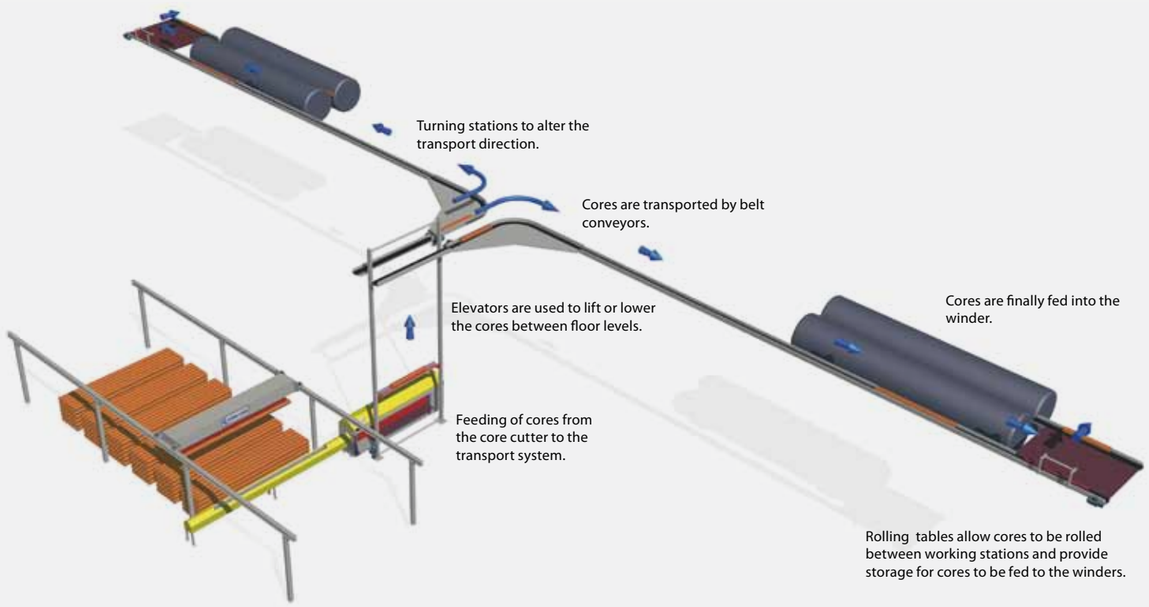
Grooved core ends improve winder performance also when the set consists of different core qualities.

Joining cores together with mating grooves in the core ends is a sure way of avoiding core eccentricity and bouncing!

Grooved Core; Metso Patent - Licensed by Core Link.

Automatic Transport System

While the most common method for transferring core sets to the winder has been set carts, many mills are turning to fully automatic delivery systems. Using a combination of conveyors, elevators, turning stations and buffer tables, these systems assure delivery of the prepared cores in exact set sequence while eliminating labour and saving space.



Broke Roll Handling

For handling broke rolls, there are two major techniques: the conventional roll splitters and the roll cutter. Within the area of broke roll handling Core Link has several solutions, all developed to contribute to the ongoing efforts for reducing overall costs. Described below is the roll cutter. Core Link has broke roll handling equipment not only for paper but also for metal- and plastic rolls.

Roll Cutter

One of the most exciting innovations within broke roll handling is the Core Link broke roll cutter (patented).

- Reduced maintenance cost
- Extended pulper lifetime
- Usage of smaller pulper - less energy consumption
- Reduced pulper cycle time - increased productivity
- Maximal safety for the operators

Roll Cutter, Tissue

Roll Cutter, LWC Paper

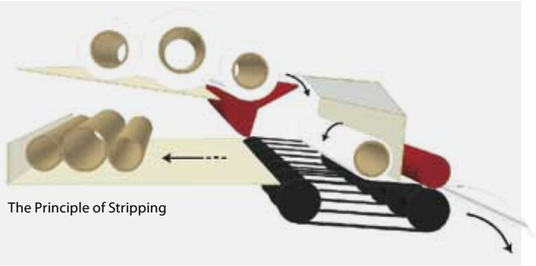
Core Link has developed a roll cutter designed to handle tissue rolls. This new roll cutter reduces problems for tissue paper makers by automatically and reliably tissue cutting.

Butt Roll Handling

Whether you have a rewinder, sheet cutter, printing or other converting facility, butt rolls are generated. As butt rolls normally present more of a problem than any value, the paper needs to be separated from the core. Separated, the paper could – as well as the core – represent a significant value.

Core Stripper

The Core Link (patented) core stripper unwinds the paper from the core, often directly to a pulper. The machine can be extended with different systems to handle the butt roll and the stripped core.



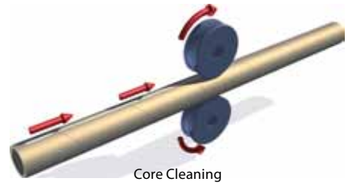
The Principle of Stripping

Butt Roll Cutter

The butt roll cutter, (patented), is a very useful alternative where the traditional core stripper is not suitable, for example for tissue rolls.

Core Recycling

Core Link is able to combine the handling of cores and broke / butt rolls with the recovery of used cores. Core recycling reduces costs for new cores, labour and core waste as well as landfill fees. Core Link can also supply machinery necessary for the first step in all core recycling; core cleaning.



Core Cleaning

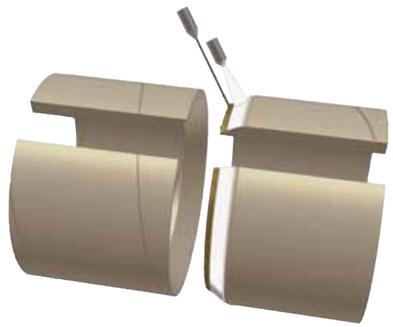
Core Splicing – Profitable in Many Ways

Core recycling by gluing can be installed as a stand alone unit or integrated into the core and broke roll handling system.

Instead of disposing the cores which represent a substantial value, core splicing makes appropriate reuse possible.

Used cores are spliced into a new parent core - splicing waste to usable cores!

- Cost savings due to reuse of cores
- Reduced environmental impact



Core Link Splicing Technique, Patented

Core Splicing System

Core Splicing in a Finnish Mill

Systems for Reusable Cores

Some of the printing sites that handle big volumes of identical roll width benefit from using reusable aluminium or plastic cores.

Core Link has the solutions to integrate handling of reusable cores into the general core handling.

Core Link can provide the mill with an extension of existing core handling system to automatically handle and mix reusable and virgin cores without manual handling.

- Fully automatic unloading and storing
- Stripping core from paper
- Cleaning core from glue or tape remains
- Quality check of core before next use
- Possibility to mix reusable and paperboard cores

Core Checking Station for Reusable Cores

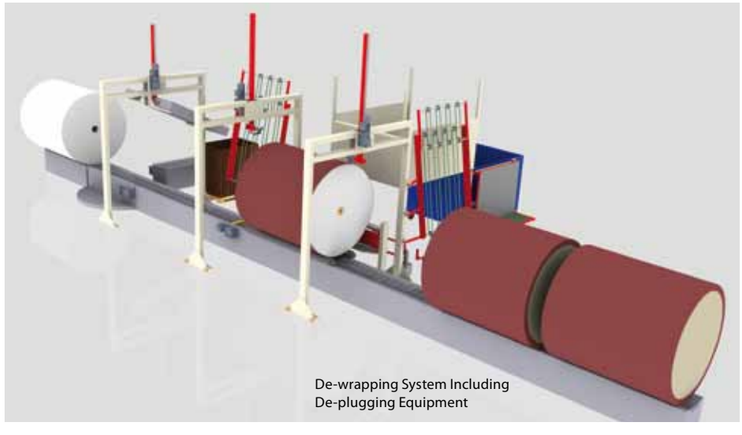
De-wrapper

Automated de-wrapping has two main purposes: Effectiveness and Ergonomics/Safety. Core Link machinery system, patent pending, for removal of paper rolls outer wrapping can also be expanded with a fully automatic de-plugger for removing of core plugs.

De-wrapping is performed from inside which avoids roll damage.

The Core Link system can ensure fully automatic transport of the unwound wrapping material to a waste container.

The system can also maintain roll traceability, for example through attaching a RFID-tag in connection with the de-wrapping process.



De-wrapping System Including De-plugging Equipment

Automatic Roll Plugger

The system improves the working environment and increases the overall efficiency, while reducing manual labour and working injuries.

It is possible to install the Core Link roll plugger directly on existing roll conveyors or off-line depending on the local premises.

- Automatic adjustment depending on diameter and width of the roll
- One or more plug dimensions

Plugging Equipment

Plugged Roll

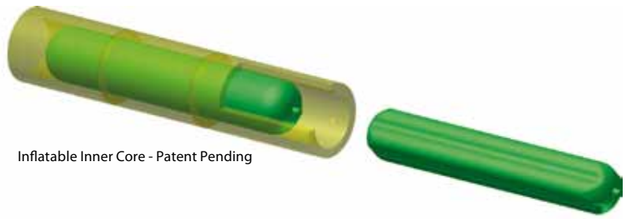
Customized Technology - Other Products

Cost Effective Multi Roll Packaging

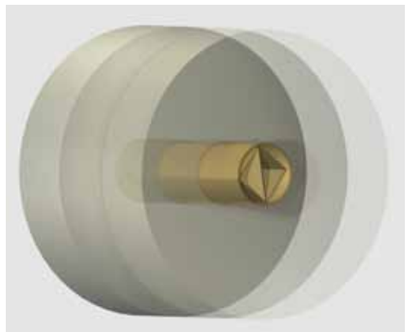
To allow transport of bundled rolls is of great value for the paper makers. The basis of Core Links different multi roll packaging solutions is to create an inner core from a flat or inflatable material.

Features and benefits of Core Link inner cores are:

- Less storage space needed
- Decreased transport costs
- Automatic insertion possible



Inflatable Inner Core - Patent Pending



CLICS® Patented Solution from Core Link

RFID - Reel and Core Tracking

System for RFID, Radio Frequency Identification, is rapidly replacing bar-code for identification all kinds of products.

RFID-system has many advantages compared to bar-code system:

- Higher readability
- Lower maintenance cost
- Cost effective and easy expandable

Core Link has the partners, the know-how and the applying equipment to offer RFID-systems for core and paper reel tracking through the entire roll/core life cycle.

RFID-tag

Tagged Core

High Performance Cooling Rolls

Core Link delivers cooling rolls with steel or copper shells and with customized surface finishing.

Core Link offers extensive technical support:

- Measurement and thermal analyze of the whole process
- Thermal and mechanical design of the cooling roll
- Deformation and stress analyze through FEM calculation
- Reconditioning of the surfaces
- Internal cleaning of the rolls