Sonoco's Metallan Core

Delivering Engineered Carrier Solutions for the Metal Industry

Case Studies

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Study 1

Who: Stainless steel producer in Germany
Product: Stainless steel
Problem: This customer wanted an optimised radial core which could manage the radial pressure of the metal and at the same time cope with the demands placed on the core as a result of their expanding winding shafts
Sonoco Alcore solution: Sonoco Alcore's technical manager and sales manager undertook a customer visit in order to truly understand the customer's production process and current core usage
Result: We were able to deliver raw material cost savings by specifying and defining the relevant parameters such as OD stiffness rather than the traditional Flat Crush

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Study 2

Who: Multi-site metal producer in Europe
Product: Aluminium coated products
Problem: This producer uses different cores for different calipers and experiences sags and V-buckles of the aluminium. Sags can cost this producer up to €30K per damaged roll; V-buckles are not as costly but the inside of the roll and aluminium is damaged.
Sonoco Alcore solution: On-site customer visit and lab testing at our Core Competency Centre to optimise the cores used across multiple sites
Result: Removal of the V-buckle and sag issues saves the customer €30K per damaged roll as well as 5% -10% cost savings on core spend through our optimisation project

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Study 3

Who: Metal producer in Eastern Europe
Product: Aluminium products
Problem: The customer requires both OD stiffness and sufficient wall thickness to prevent V-buckles when winding thin aluminium sheets
Sonoco Alcore Solution: Core specification focused on OD stiffness and wall thickness parameters
Result: Preventing claims arising from V-buckles creates cost savings of up to €30K per roll as a result of not wasting the aluminium material

To learn more about our technical approach and product offering contact us:

Please visit our website:
www.sonocoalcore.com/contact
and complete a contact form. This will be automatically distributed to the appropriate sales representative who will follow up your request.

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How does Sonoco Alcore deliver such results to metal customers?

Our Approach:

In order to correctly specify paper cores for metal industries it is very important to understand the material type such as stainless steel, aluminium, or other metal sheets. In conjunction with the material type we need to understand the caliper of the material and possible coatings. Depending on the process requirements, we can determine what core design is needed and our approach focuses on the elements detailed below.

Considerations for Specifying Cores for Metal Industries

In order to understand the type of customised core needed we must first understand the customer's metal material and its interaction with the core.

Self-Supporting versus Non Self-Supporting

In some metal applications a core only serves as protection and in this case low quality thin wall cores are sufficient. This is typically for metals with a caliper of more than 600 microns. For many metals with a caliper less than 300 microns the core is a critical component in contributing to an excellent reel structure and provides a solid foundation for the metal. This includes thin, smooth coated metals where the core is placed on a mandrel.

Our cores for metal and aluminium producers are based on the following technical parameters:

1. Manage Radial Pressure – During the winding process uniform pressure is applied by the metal on the outside core surface due to the web tension. As a result, the core applies equal pressure to the inside of the roll. A core must be specified for OD Stiffness rather than Flat Crush to replicate this interaction.
2. Reel Structure – As a result of the pressure applied, the core must maintain its shape in order minimise the risk of V-buckles, sagging, telescoping and many other issues.
3. Cost-effective performance –The core must meet the performance needs of the application and at the same time be cost-effective for the customer.

Wound Material and Caliper:

In order to correctly specify paper cores for metal industries it is very important to understand the material type such as stainless steel, aluminium or other metal sheet types as well as the caliper of that metal and possible coatings. Depending on the process requirements, we can determine what core design is needed and our approach focuses on the following elements:

OD Stiffness	When thin, low friction metals are wound on a core, radial pressure is exerted on the core and it must be designed accordingly.
Wall Thickness	Expanding mandrel geometry can have an impact on core design as well. Certain expanding mandrels may require thicker wall cores in order to reduce deformation and the risk of V-buckle.
Process parameters	Process parameters like winding mandrel, wound sheet and roll weight are considered in core design

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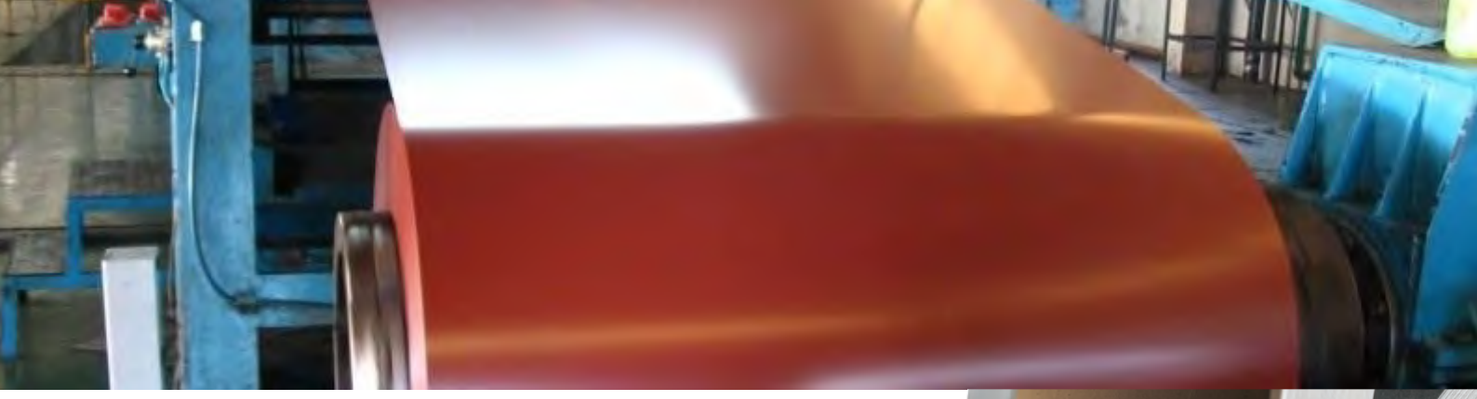

What is OD Stiffness?

OD Stiffness reflects how much the outside diameter shrinks due to wound pressure.

Why should metal producers be concerned with OD Stiffness?

Sonoco Alcore focuses on specifying a core for OD Stiffness together with sufficient wall thickness. This approach meets the needs of metal producers and their production process.
As shown in Figure 1. Flat Crush simply measures the amount of compression strength it takes on the top and bottom of the core for it to break. In reality, when metals are wound on a core forces are not only exerted on the top and bottom of the core. It is for this reason specifying Flat Crush does not provide the most accurate needs or specification to design a core for metal applications.

Fig 1.
Flat Crush

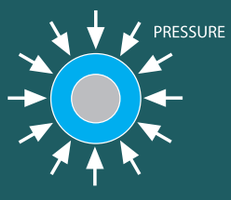

Fig 2. Actual pressure placed on a core wound with metal

Specifying on OD Stiffness finds a cost-effective core solution with more reliable core performance OD Stiffness and core wall based design benefits:

- reflects the load placed on a core by the winding process
- prevents V-buckle and sag issues by allowing a wider range of web tensions
- leads to a core design which provides a good foundation for a reel to form which is especially important for the inner metal layers
- delivers cost savings both on core spend and production issues

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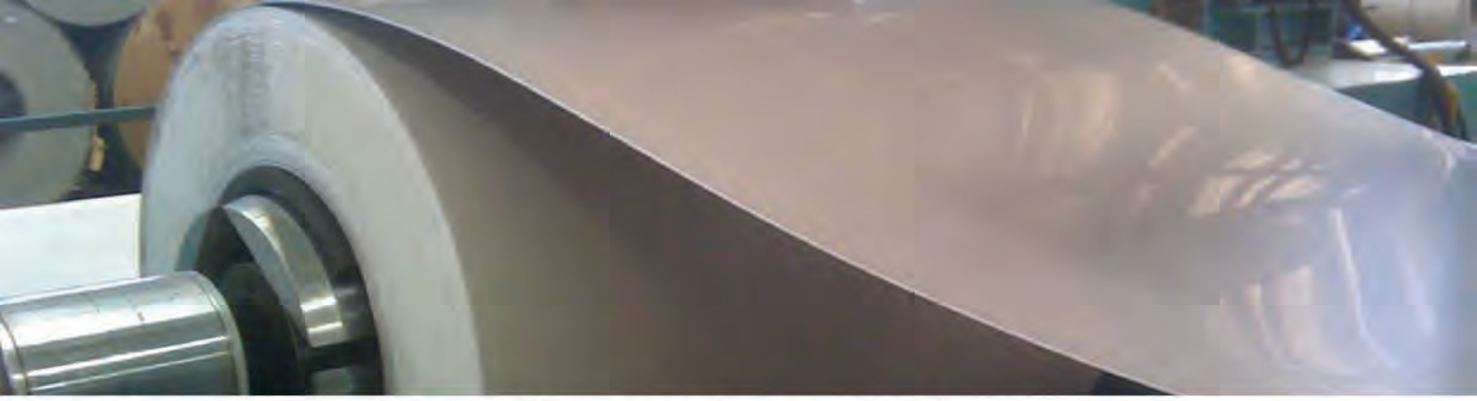


Core Inside Diameter and Mandrel Expansion

During metal production the winding shaft often expands several millimetres. If the core is too big it doesn't function on the mandrel during unwinding and if the core is too small the core will crack under the pressure of the expanding mandrel or the inside diameter will fold, leading to sag issues. We focus on establishing the degree of mandrel expansion in order to design a core which performs most effectively.

Sonoco Alcore Quality Controls

Our engineered carriers follow six sigma methods and we complete a number of quality controls to ensure our cores meet your needs.

Adhesion Check – If the core plies are poorly glued it will not function on your line which is why we internally check our cores.

Ply Gap Check – Gaps between the plies are also checked during production as large ply gaps negatively affect core performance.

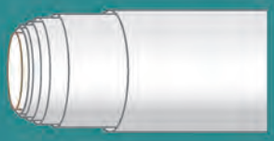
Many winding mandrels deform cores, which is why correct core design is critical to ensure the core provides a round foundation for the forming reel

Protective Packaging – The specific packaging of cores is imperative to prevent damage to the outside surface of the core which interacts with your metal product. We design packaging solutions that protect the rolls throughout the production process from the mill to the customer. We can also determine packaging needs for shipping abroad in trucks or containers.

Right Moisture Solution – Due to the high strength requirements of metal producers, our cores are delivered with the right moisture level bearing in mind full product life cycle including end use customer needs.

Avoid these issues

Use a Sonoco Alcore core where the right parameters are specified in core design.



V-buckle

Occurs when web tension is too high on the wound layers.

Sag

The result of insufficient web tension causing thecore ID to deform under the weight of the reel.

Dust

Metal producers should be aware that dust contaminating the paper core would be transferred to the metal material. We can deliver our cores totally covered to ensure dust does not contaminate your product. This is especially important if the cores are stored in a warehouse for prolonged periods or exported.

Telescoping

Caused by insufficient web tension when the metal layers essentially slide off the core.

Slippage

Where tension is not high enough and insufficient friction causes the metal to slip

Scratch

If the core does not have a sufficiently smooth outside surfaceit can scratch the metal once wound on the core. We can use soft outside surfaces for our customers if required.

Longitudinal break

The core cannot withstand the pressures exerted by the metal and breaks down the middle.

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Use Paper not Metal Cores

• Metal cores deform- Once the aluminium cores deform or are damaged they cannot be used and a paper core is a one-way solution.
• No recovery needed- If you use metal cores you need to recover them for re-use. It is an expensive and time-consuming activity for metal producers to find and ship back the empty metal cores. This is not required when using paper cores.
• Save time– Metal cores must be inspected before re-use which is avoided by using a one-time paper core solution.

Our paper cores can manage a variety of web tensions, prevent damage to the metal and optimise production costs

• Metal Added Value Solutions– Our paper cores allows your brand to bring additional value to the final customer with full traceability through Bar Codes, QR and RFID features as well as Anti-Rust and other industry leading solutions.
• No waste- Many converters who receive your reels cannot use the metal cores, so they become waste. In addition, metal cores are more difficult and more costly to recycle. We provide a 100% recyclable alternative.
• Cost-competitive- Paper cores are competitive in terms of cost versus metal cores.

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