

# PAPER WRAP

THE SUSTAINABLE PAPER PALLET WRAPPING SOLUTION



**FAST**



**SUSTAINABLE**



**STABLE**



**PATENTED**

# STAND ALONE — SEMI AUTOMATIC



# STAND ALONE — FULLY AUTOMATIC

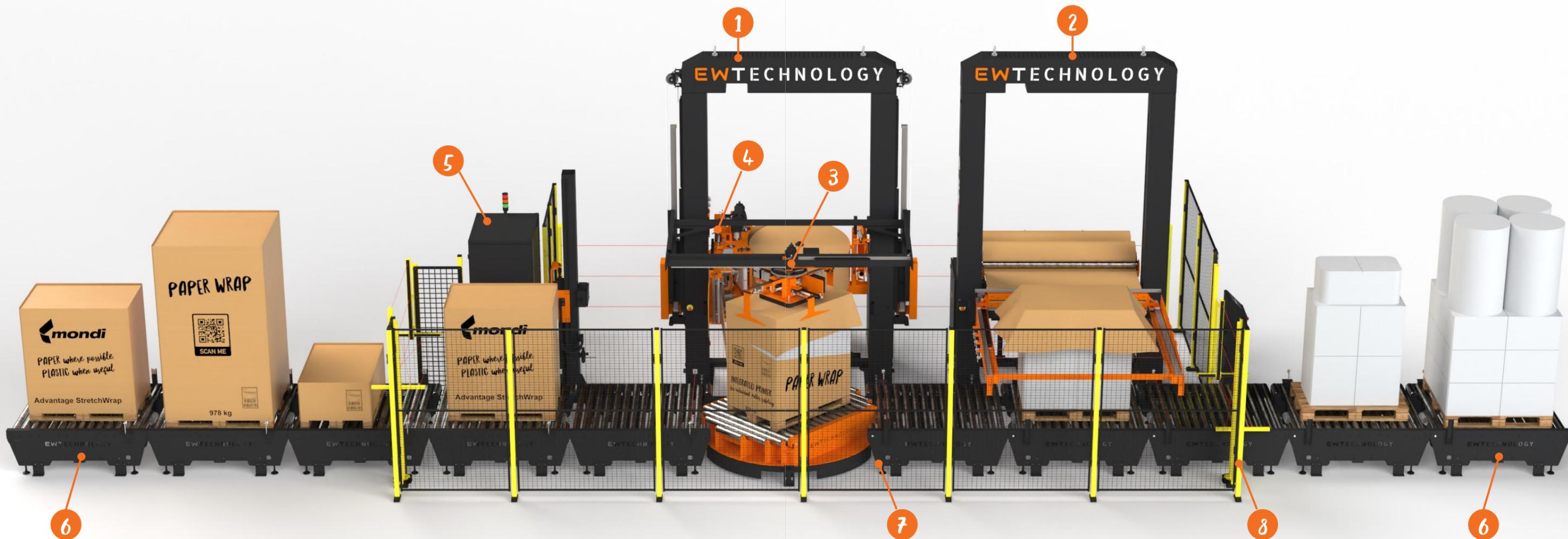


# FULLY AUTOMATIC LINE INTEGRATION



Technical values	Stand Alone		Line Integrated
	Semi-Automatic Setup	Fully-Automatic Setup	Fully-Automatic Setup
Capacity* [pallets/hour]	10-15	25-40	50-70
Max. reel weight [kg]	35	450	450
Max. reel diameter [mm]	350	1200	1200
Paper width [mm]	490	490	490
Max. rotational speed of turntable* [min <sup>-1</sup> ]	15	20	20
Paper consumption* [kg/pallet]	0.6-1.2	0.6-1.2	0.6-1.2
Wrapping operations until reel change* [-]	30-60	375-750	375-750
Pallet loading system	Manual or electric pallet truck	electric pallet truck or forklift	inlet and outlet conveyors
Paper loading system	none	manual loading trolley	manual loading trolley
Max. Pallet length [mm]	1250	1600	1600
Max Pallet width [mm]	1250	1300	1300
Max. wrapping height [mm]	2000/2500	2000/2800	2000/2800
Max. pallet weight [kg]	1500	2000	2000
Adjustable wrapping parameters	✓	✓	✓
Paper folding device for lower edge (10cm)	✓	✓	✓
Mechanical tilt compensation	✓	✓	✓
Tension control system	✓	✓	✓
Pallet height detection	✓	✓	✓
Automatic paper application for wrapping start	✓	✓	✓
Automatic gluing system	✓	✓	✓
Automatic cutting at the end of the process	✓	✓	✓

\*Values depend on wrapping parameters, pallet height and palletized goods

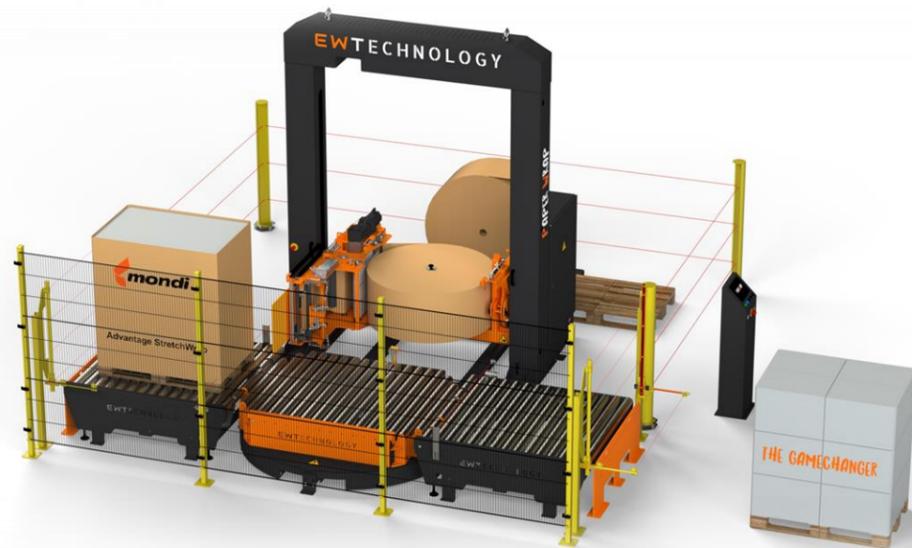


## OVERVIEW & ADD-ONS

- 1 PAPER WRAP**  
 FULLY AUTOMATIC PALLET WRAPPING MACHINE FOR PAPER
- 2 PAPER TOP**  
 FULLY AUTOMATIC PAPER TOP SHEET DISPENSER (REQUIRES DOWN HOLDER WITH FOLDING ARMS)
- 3 DOWN HOLDER**  
 WITH OR WITHOUT FOLDING ARMS FOR TOP SHEET
- 4 INTEGRATED PRINTING SYSTEM**  
 FOR INDIVIDUAL PALLET LABELING (LABEL, LOGOS, QR- AND BARCODES)
- 5 PALLET LABELING SYSTEM**  
 FOR 1, 2 OR 3-SIDED LABELING
- 6 CONVEYING TECHNOLOGY**  
 FOR INLET, OUTLET AND CUSTOMIZED LAYOUTS
- 7 WEIGHING TECHNOLOGY**  
 INTEGRATED INTO PALLET CONVEYOR
- 8 SAFETY EQUIPMENT**  
 FENCES, LIGHT CURTAINS AND MUTING SYSTEMS (STANDARD OR CUSTOMIZED LAYOUT)

# 1 PAPER WRAP

FULLY AUTOMATIC PALLET WRAPPING MACHINE FOR PAPER



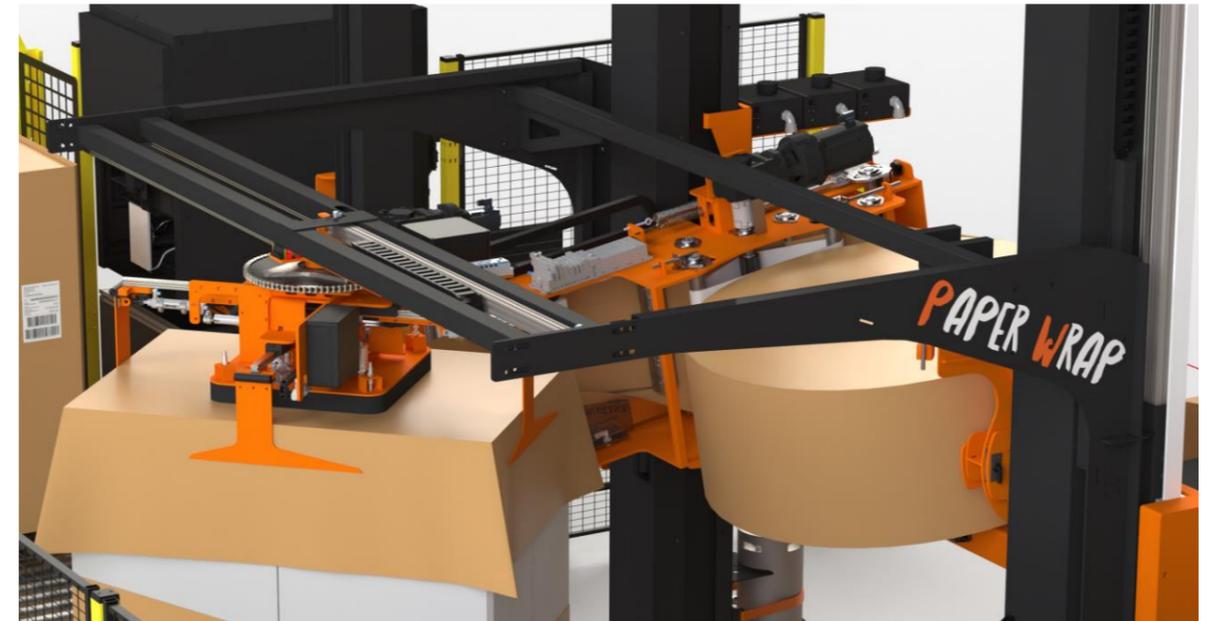
# 2 PAPER TOP

FULLY AUTOMATIC PAPER TOP SHEET DISPENSER (REQUIRES DOWN HOLDER WITH FOLDING ARMS)  
CAPACITY: 70 PALLET/H



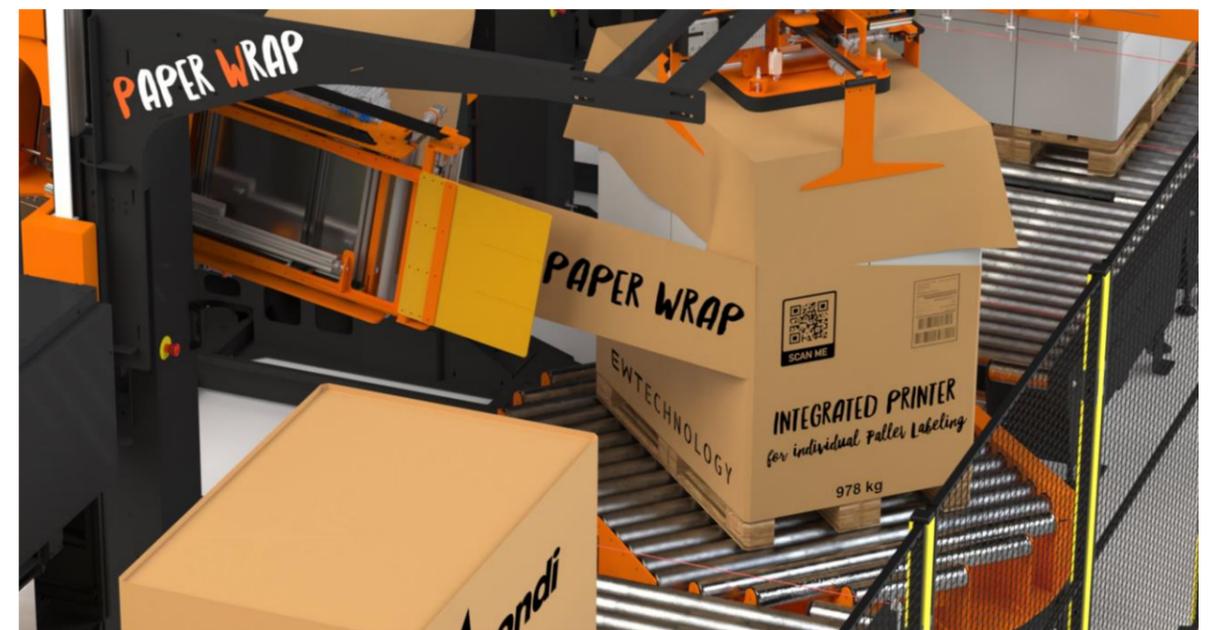
# 3 DOWN HOLDER

FOR STABILIZING LIGHT AND UNSTABLE PALLETS AND INCREASING CAPACITY  
OPTIONALLY WITH FOLDING ARMS FOR PAPER TOP SHEET



# 4 INTEGRATED PRINTING SYSTEM

FOR INDIVIDUAL PALLET LABELING (LABEL, LOGOS, QR- AND BARCODES)  
1 PRINTHEAD — 108 MM PRINTING HEIGHT  
2 PRINTHEADS— 216 MM PRINTING HEIGHT  
3 PRINTHEADS— 324 MM PRINTING HEIGHT



**5** **PALLET LABELING SYSTEM**  
FOR 1, 2 OR 3-SIDED LABELING / HEIGHT ADJUSTABLE



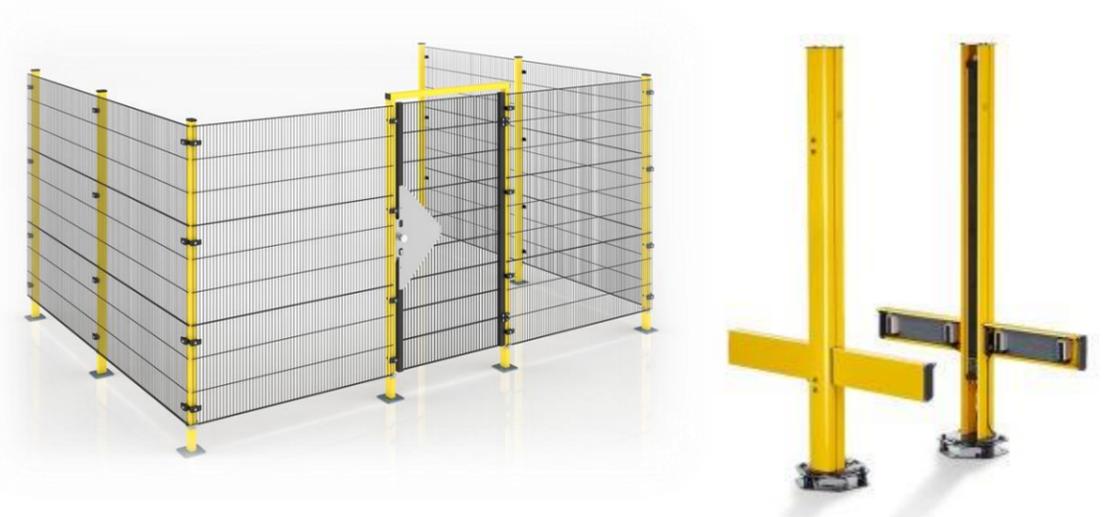
**6** **CONVEYING TECHNOLOGY**  
FOR INLET, OUTLET AND CUSTOMIZED LAYOUTS



**7** **WEIGHING TECHNOLOGY**  
INTEGRATED INTO PALLET CONVEYOR (WEIGHT CAN BE PRINTED ONTO PALLET)



**8** **SAFETY EQUIPMENT**  
FENCES, LIGHT CURTAINS, DOORS AND MUTING SYSTEMS (STANDARD OR CUSTOMIZED LAYOUT)



# Advantage StretchWrap LIFE CYCLE Assessment

## Life Cycle Assessment

LCA is a method used to assess the environmental impacts throughout a product's life cycle from raw material acquisition to production, use and end-of-life treatment, such as recycling and final disposal (i.e. cradle-to-grave).

## Functional Unit

The packaging required to wrap one Euro-pallet at the customer for the transportation of goods, excluding the pallet itself, further transport or product losses. The end-of-life of the wrap is included.

## The reference flows in the LCA are:

- Paper-based Advantage StretchWrap: 840g per Euro-pallet
- Plastic stretch film, 0% recycled content: 400g per Euro-pallet
- Plastic stretch film, 50% recycled content: 400g per Euro-pallet
- Plastic stretch film, 30% recycled content: 400g per Euro-pallet

**Baseline scenario:** both materials are recycled at the end-of-life

## Impact Assessment Method:

Environmental footprint (EF) method 3.0:

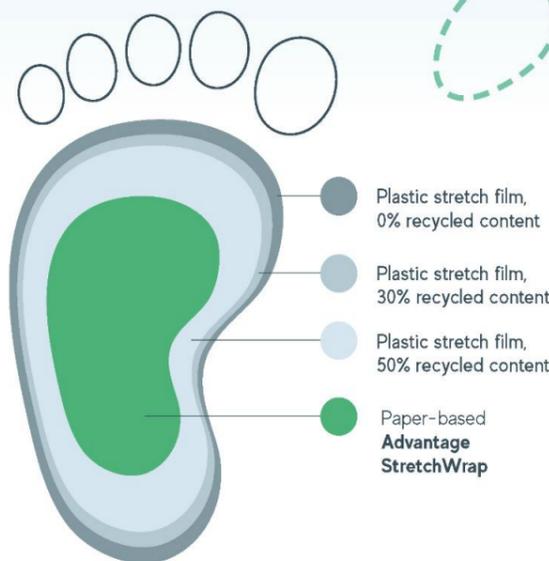
This method is the impact assessment method of the Environmental Footprint initiative by the European Commission and has 16 mid-point indicators.

Advantage StretchWrap is responsible for lower impacts in these categories:

- Climate change
- Fossil resource use
- Ionising radiation - human health
- Particulate matter
- Human toxicity (cancer)
- Human toxicity (non-cancer)
- Freshwater ecotoxicity
- Acidification
- Mineral and metal resource use

## Carbon footprint:

Advantage StretchWrap has the smallest footprint

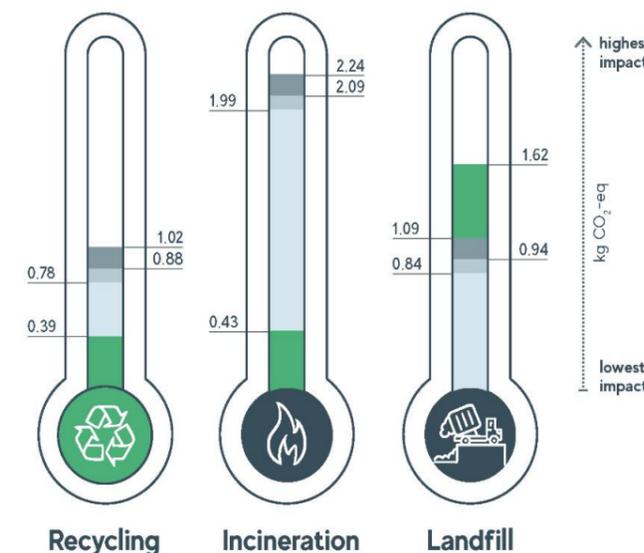


This means that Advantage StretchWrap's carbon footprint is:



## Climate Change impact across the full life cycle

based on 3 end-of-life scenarios



Recycling is the best end-of-life scenario for paper, but also for plastic.

Advantage StretchWrap can be recommended to mitigate climate change impacts

The different end-of-life scenarios have an impact on the results - recycling is the preferred option

There are impacts in other categories which need to be reduced to show an overall environmental advantage

**Mondi's recommendation**

We evaluate each potential application of Advantage StretchWrap on a case-by-case basis

Choose the right materials for the right applications: Application and wrapping processes need to be taken into consideration for efficient wrapping

## Life Cycle Assessment

# KEY take AWAYS

\*The 16 environmental indicators of the EF method: Climate change, Ozone depletion, Ionising radiation, Photochemical ozone formation, Particulate matter, Human toxicity (non-cancer), Human toxicity (cancer), Acidification, Freshwater eutrophication, Marine eutrophication, Freshwater ecotoxicity, Land use, Terrestrial eutrophication, Water use, Fossil resource use, Metal and mineral resource use;

# Advantage StretchWrap



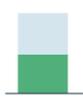
- + **Lightweight** paper of 70 gsm
- + Exceptional **tensile energy absorption**; combines stretch and tensile strength, so the wrapped pallet resists tearing during transportation
- + **No recycled content**, which could impact on its strength
- + **No coating** on its surface that make it recyclable, but sensitive to heavy rain
- + **Recyclable** in paper streams and of high recycling value as secondary material (*Paper waste for recyclers*)
- + **Resists breaking** due to its high **puncture resistance**
- + Successfully tested for **safe transport** according to EUMOS standard. Different G forces applied according to the standard.

## Technical values

Properties		Method		Typical values
Thickness	µm	ISO 534		105
Tensile strength	kN/m	ISO 1924-3	MD	7,8
			CD	3,3
Stretch	%	ISO 1924-3	MD	11
			CD	10
Tensile Energy Absorption	J/m <sup>2</sup>	ISO 1924-3	MD	420
			CD	245
Tear strength	mN	ISO 1974	MD	760
			CD	1340

Advantage StretchWrap's  
Carbon footprint is:

 **62%** lower than the **virgin plastic stretch film**

 **49%** lower than the **plastic stretch film** with 50% recycled content



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