



Stretching the limits

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KEY FEATURES

Headquartered in **Johannesburg**

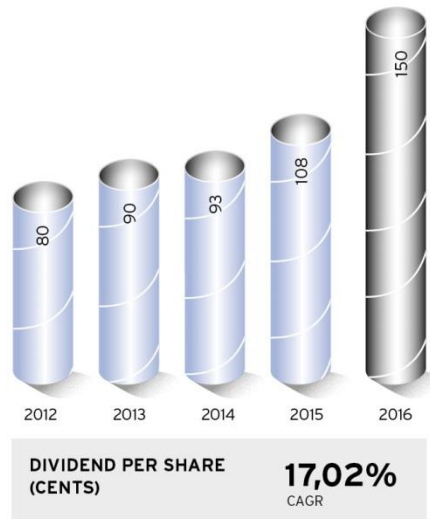
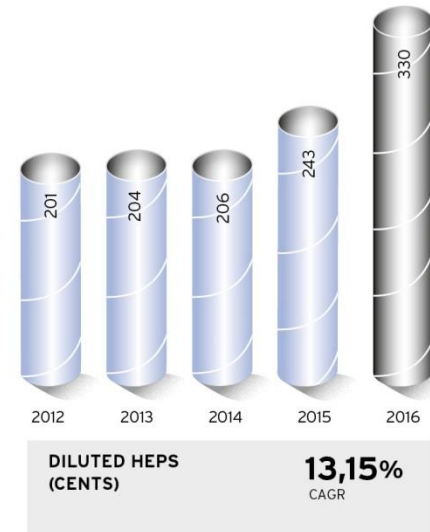
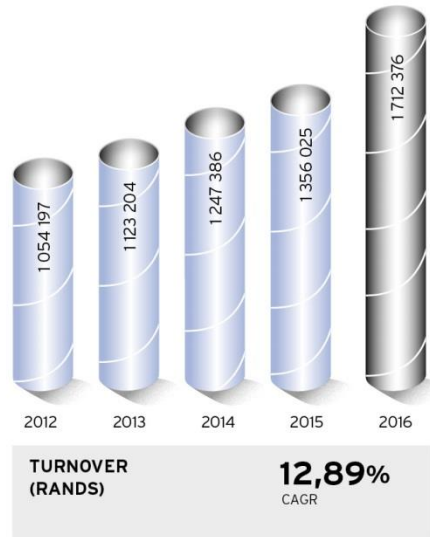
11 production
facilities country-wide

National
distribution capability

Level 4
B-BBEE contributor

1 401
employees

Market cap
R786,3m
(at 30 June 2016)



FINANCIAL STATISTICS

	2016	2015	2014	2013	2012
Current ratio (x)	2,26	2,34	2,17	2,16	1,86
Net interest-bearing debt : equity ratio	Net cash positive	Net cash positive	Net cash positive	Net cash positive	Net cash positive
Operating income margin (%)	9,2	8,1	7,8	8,3	9,1
NAV per share (cents)	1 592	1 387	1 249	1 127	1 002

HIGHLIGHTS

R1,7bn

Group turnover up 26.3%
(2015: R1,4 billion)

329,6c

Diluted HEPS up 35,7%
(2015: 242,8 cents)

150cps

Dividend up 38,9%
(2015: 108 cps)

R157m

Total operating profit up 42,7%
(2015: R110 million)

332,7cps

EPS up 35,6%
(2015: 245,3cps)

1 592cps

NAV up 14,8%
(2015: 1 387 cps)

OPERATIONAL

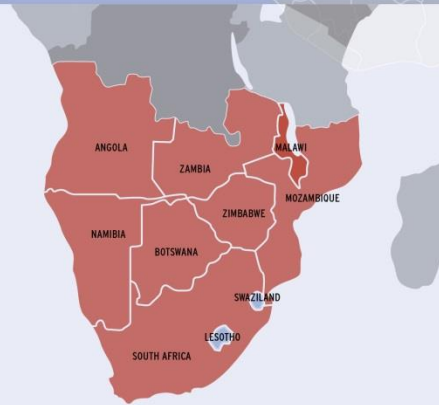
Maintained
**Level 4
B-BBEE**

Bedded down
**East Rand Plastics
acquisition**

New pallet wrap
**plant ordered for
Specialised Films**

TRANSPACO AT A GLANCE

MARKETS WE SERVE



Plastic Products:

- 7 manufacturing sites
- distribution centres throughout South Africa

Paper & Board Products:

- 4 plants and 1 distribution centre

Properties & group services:

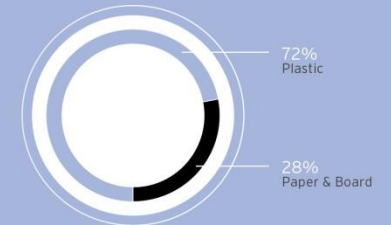
- Boosens Road Properties; Explosive Film Technologies and Transpaco Administrative and Financial Services

GROUP SNAPSHOT

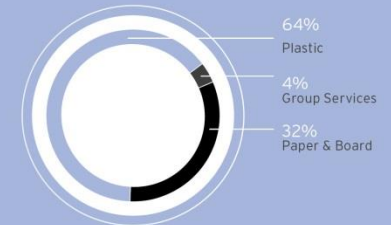
We manufacture, distribute and recycle plastic and paper packaging products for sectors including retail, industrial, agriculture, mining, pharmaceutical and automotive. Our products are customised to individual requirements and distributed across the country and into southern Africa.

In the three decades listed on the JSE - 'Containers and Packaging' sector - Transpaco has continued delivering consistent incremental growth. Our growth strategy is driven by unlocking and generating solid organic growth and identifying and pursuing earnings-enhancing acquisitions.

SEGMENT BREAKDOWN



Contribution to group turnover by division



Contribution to group operating profit by division

EAST RAND PLASTICS

- Africa’s largest manufacturer of refuse bags
- Factory situated in Gauteng with national distribution
- Garbie brand and individual House Brands
- Manufactured from pre and post-consumer recycled material protecting our environment
- Produced in flat and perforated or interleaved roll forms
- Certified ISO 9001:2008

PRODUCTS

- Black, clear and colour refuse bags, bin liners, sheeting and film
- Light, medium and heavy duty for the local and export household and garden markets
- Heavy duty industrial markets

RECYCLING

- Recycles polyethylene pre and post-consumer waste
- Supplies polymer throughout South Africa and many African countries
- Two recycling plants (Bronkhorstspuit and Elandsfontein)
- Well-developed sustainable sources of supply
- Modern, efficient plant and equipment
- Comprehensive quality assurance system
- Certified ISO 9001:2008 (Bronkhorstspuit)

PRODUCTS

- High density polyethylene
- Low density polyethylene

FLEXIBLES

- Manufactures flexible plastic packaging solutions
- Four manufacturing sites (Gauteng and Western Cape)
- Distribution facilities throughout South Africa
- Certified ISO 9001:2008 (Cape Town)

PRODUCTS

- Retail vest-type plastic bags
- Retail boutique plastic bags
- Refuse bags
- Industrial plastic bags
- Tubing and sheeting
- Scholastic stationery

SPECIALISED FILMS

- Manufactures specialised films - three, five and seven layer cast film products
- One manufacturing facility (Bronkhorstspuit)
- State-of-the-art equipment to produce products of the highest quality and standard
- Distribution facilities throughout South Africa
- Certified ISO 22000:2005

PRODUCTS

- Cast pallet stabilisation wrapping
- Stretch film
- Three, five and seven layer cast film



BRITEPAK

- Manufactures printed folded cartons and package inserts
- One manufacturing plant (Gauteng)
- Prepress service, including Suprasetter plate-setting technology
- Lithographic printing including offline, high quality ultra-violet varnish capabilities
- Sophisticated finishing including modern automatic flat-bed die-cutting
- State-of-the-art gluing and folding including braille Capabilities

PRODUCTS

- Printed folded cartons and package inserts

PACKAGING

- A leading packaging supplier to the retail, industrial, wholesale, agricultural, automotive and stationery markets
- One distribution facility (Gauteng)
- Several branches throughout South Africa

PRODUCTS

- Corrugated board and cartons
- Pallet and food wrap
- Paper bags
- Plastic bags, tubing and sheeting
- Tape and closures
- Cleaning materials
- Protective clothing
- Paper and board
- Packaging machinery

DISAKI CORES AND TUBES

- A leading manufacturer of spirally wound tubular cardboard cores, carton dividers, void fillers and angle boards
- Three manufacturing plants (Gauteng, KwaZulu-Natal and Western Cape)
- Fully automated core winding and cutting operation
- Modern, sophisticated plant and equipment
- Certified ISO 9001:2008

PRODUCTS

- Heavy duty cores
- Light duty cores
- Yarn cores
- Tape cores
- Conical containers
- Void fillers
- Carton dividers
- Angle boards

PROPERTY AND GROUP SERVICES

- Provides property owning and central administration, financial and related services to all group divisions
- Resources and facilities
- Boosens Road Properties
- Explosive Film Technologies
- Transpaco Administrative and Financial Services

- Transpaco Specialised Films (Pty) Ltd is a world class manufacturing facility located in Bronkhorstspuit, Ekandustria, South Africa and is a wholly owned subsidiary of Transpaco Limited.
- Transpaco Specialised Films has enjoyed noteworthy organic growth since its inception in 2004.
- Transpaco Specialised Films manufactures seven layer cast pallet wrap for pallet stabilisation.
- Transpaco is the only cast film manufacturer in South Africa that has ISO 22000:2005 accreditation. We are a innovative manufacturer with a quality certification that was accredited as far back as 2005.
- We utilize state of the art equipment to ensure that we produce 7 layer cast film products of the highest international quality standards.
- The synergy between the four machines means that we are able to meet all the required sizes and specifications that the Southern Africa market demands.
- Southern Africa's demand for the more advanced LLDPE stretch wrap films for pallet-stabilization applications has increased dramatically with the installation of more sophisticated high speed wrapping machines.
- Transpaco Specialised Films is able to offer a high quality stretch film product offering up to 350% stretch.
- The investment in the correct technology has allowed us to remain competitive and as the market leader in cast stretch-wrap, with consistent quality and internationally accepted product specific tolerances.



Factory 1

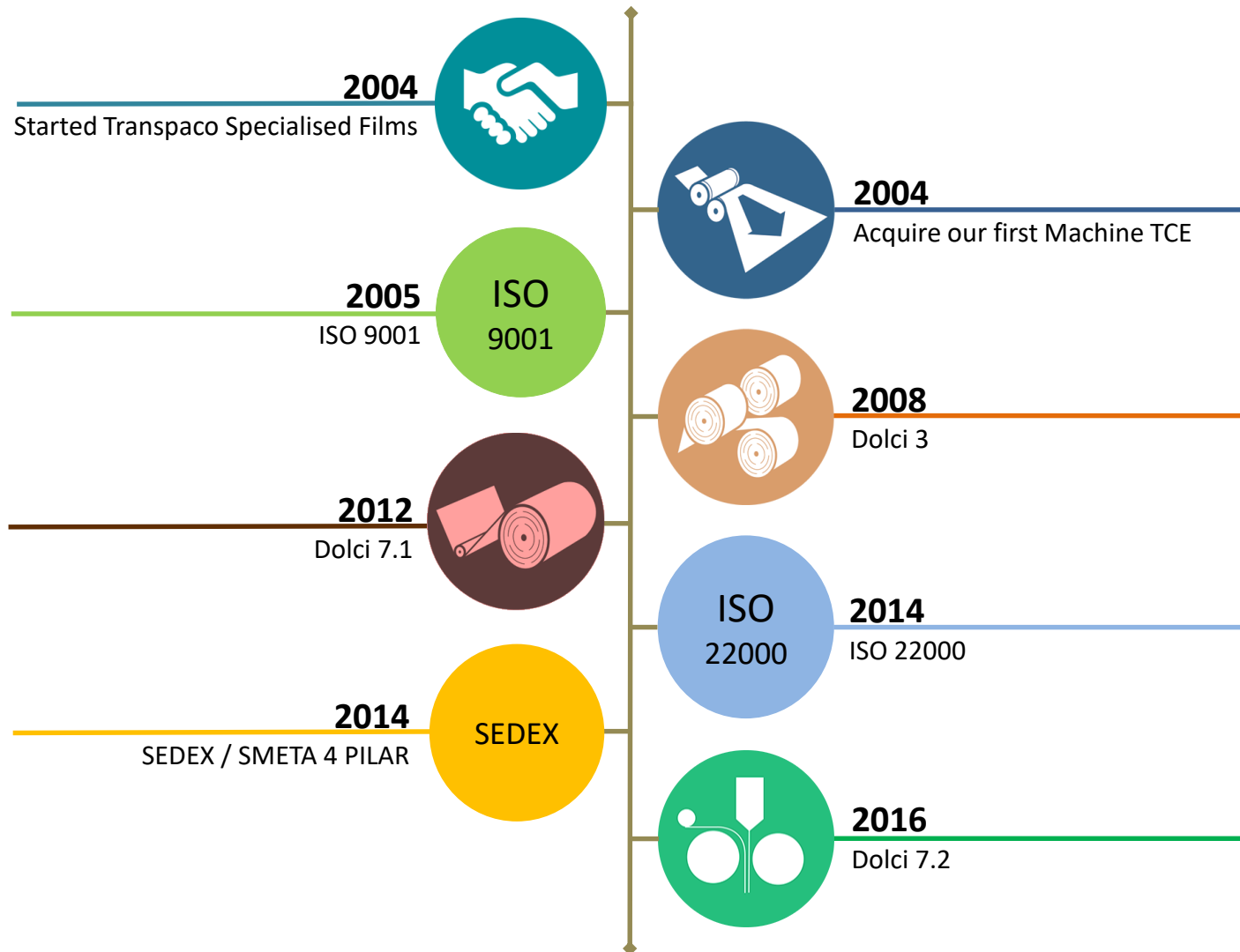
Factory 5

Core Store

Factory 2

Factory 3

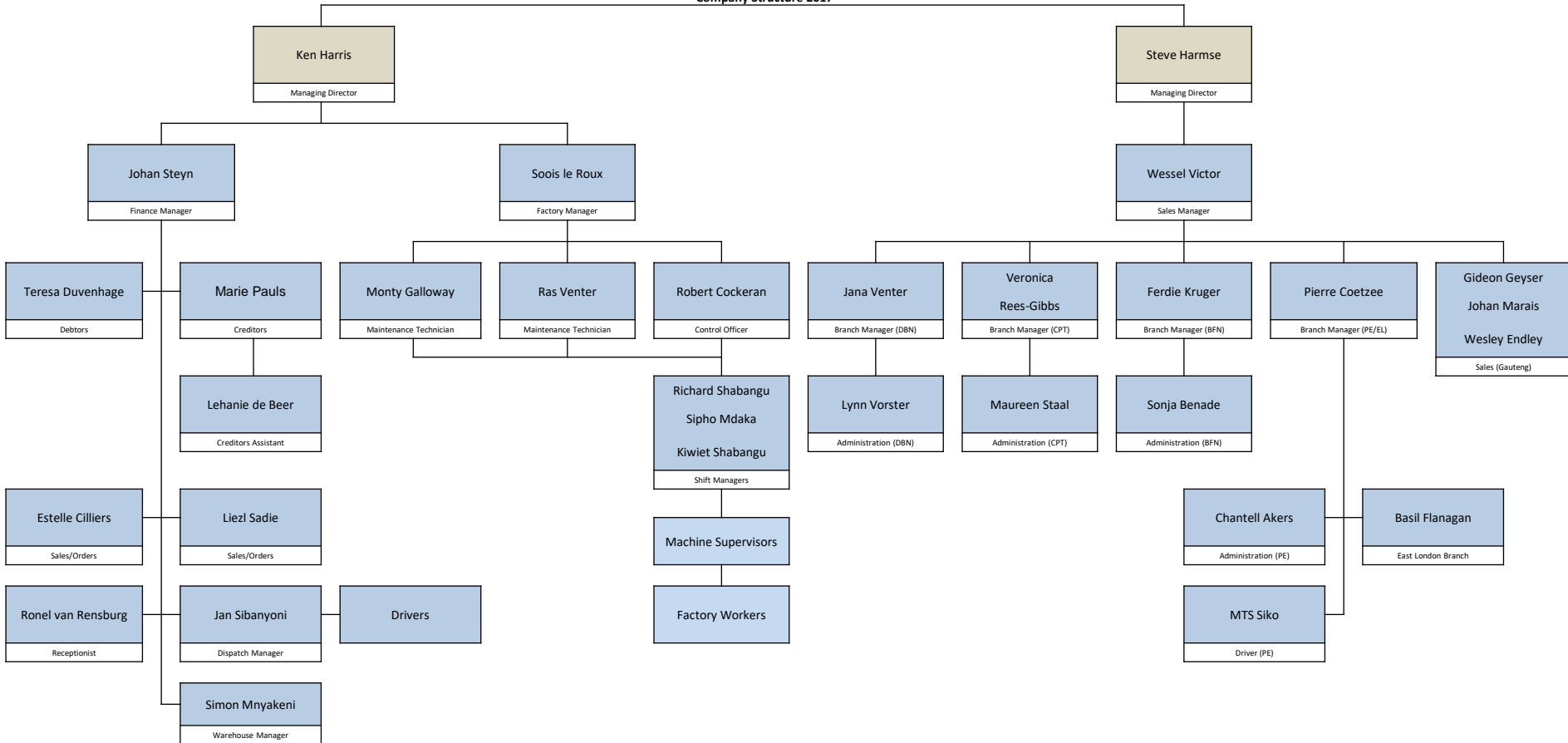
Factory 4







Company Structure 2017



Managing Directors & National Sales Manager



Ken Harris
Managing Director



Steve Harmse
Managing Director



Wessel Victor
National Sales Manager

Key Personnel



Johan Steyn
Finance Manager



Soois le Roux
Factory Manager



Jan Sibanyoni
Dispatch Manager



Simon Mnyakeni
Warehouse Manager

The Specialised Sales Team



Gideon Geyser
Sales Executive (GP)



Wesley Endley
Sales Executive (GP)



Johan Marais
Sales Executive (GP)



Veronica Rees-Gibbs
Branch Manager (WP)



Jana Venter
Branch Manager (KZN)



Pierre Coetzee
Branch Manager (EC)



Ferdie Kruger
Branch Manager (FS)

Latest installation - The line from Dolci installed in 2016 that can produce 2000mm wide 7-layer films at rates of up to 1500kgs an hour



High-output line – The line from Dolci installed in 2012 that can produce 2000mm wide 7-layer films at rates of up to 1500kgs an hour





High-output line – The ‘Stratocast’ line from Dolci installed at Transpaco Specialised Films at Ekandustria, Bronkhorstspuit, near Pretoria, can produce 2000mm wide 7-layer films at astonishing rates of up to 1500kgs an hour

Transpaco installs latest, 7-layer cast film line

FCL 7-2000 machine is designed for production of exceptionally strong multi-layer film structures ... at 1500kgs/hr!

TRANSPACO Specialised Films has recently installed and commissioned an impressive 7-layer cast film line confirming its position as the largest cast film manufacturer in South Africa, and boosting its technological ability to compete against imported stretch films. This business is located in Bronkhorstspuit, Ekandustria near Pretoria.

From Dolci Extrusion of Italy, the new line can produce 2000mm wide films at up to a whopping 1500kgs an hour. The impressive throughput is extremely important for Transpaco to remain competitive. The machine uses five extruders (1x180mm, 1x105mm and 3x65mm) to produce the seven layers. The FCL 7-2000 machine – from Dolci’s ‘Stratocast’ range – is designed for the production of exceptionally strong multi-layer film structures, referred to as ‘Plywood’ stretch films by Dolci. The new 7-layer technology is the most advanced line in South Africa based on 5 extruders with an advanced Clorien 7-layer feed block system which allows for very specific product formulations, especially for high-performance applications.

The increased number of layers and improved molecular adhesion between the layers gives the film the following advantages:

- allows for significant film down-gauging,

while maintaining the mechanical characteristics of the thicker film;

- superior puncture resistance, which prevents the films from tearing on sharp corners of pallets;
- increases the holding strength of films on wrapped pallets; and
- increases the ‘Elmendorf Tear’ properties (resistance to tear).

The local demand for the more advanced LLDPE stretch wrap films, particularly for pallet-stabilization applications prompted the R24-million investment, complimenting Transpaco’s existing business infrastructure. The three manufacturing facilities in Ekandustria are adjacent to one another, enabling Transpaco to accommodate the dimensions and power requirements of the cast lines into a single world-class manufacturing site.

“Transpaco’s loyalty to Dolci Extrusion is due to the tremendous support that we have received over the last couple of years, as well as their technological know-how,” said Ken Harris, joint-managing director with Steve Harmse, of Transpaco Specialised Films. Transpaco’s initial Dolci machine was installed in February 2008 at a cost of R16-million. Its first machine, from TCE, was installed in October 2004 at a cost of R13 million.

“The synergy between the three ma-

chines is complete and we are able to meet all the required sizes and specifications that the South African market demands. The additional capacity will enable Transpaco to improve service, cater for increasing demand for the next three to four years and provide a cost effective alternative to the imported product,” said Harris.

“Transpaco has been inundated with enquiries for the new 7-layer product, which we have tested with extremely good results,” he added.

Transpaco is the only cast film manufacturer in South Africa that has a TÜV Rheinland accredited facility with ISO 9001:2008 certification.

“We are a quality driven company with certification that was accredited as far back as 2005, which was not long after our initial startup with our first cast line installation,” said Harris.

“With the dynamics of the existing market we can expect that it will not be too long before the new extrusion line is running at full capacity,” he added.

The investment in the correct technology has allowed Transpaco to remain competitive and from its humble beginnings in 2004 elevated Transpaco Specialised Films to the market leader in cast stretch-wrap, with consistent quality and internationally accepted product specific tolerances.

The Dolci 2m wide 3-layer machine was installed in 2008.



The 1,5m wide 3 layer TCE machine was installed in October 2004.







COC/COA →

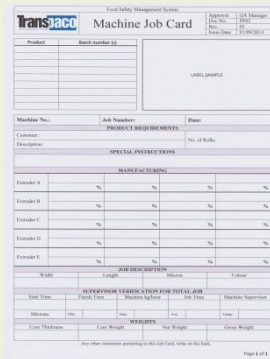
Receipt of raw material (LLDPE)

Order receipt

Size
Micron

Production planning

Formulation



Manufacturing

Visual Defects
Weight


Final Product Packing

Stores

COC

Despatch



		Food Safety Management System GENERAL PRODUCT SPECIFICATIONS - STD		Approval Doc No. Rev. Issue Date	QA Manager Spec STD 10 02/11/2016
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STRETCHWRAP (PLASTIC PALLET WRAP)		
Produced in standard sizes	Hand Rolls	Machine Rolls
Sizes Available, ±2mm	400mm & 450mm	450mm & 500mm
Roll Length, ±20m	400m	1000m, 1500m, 2000m, 2500m (µm dependant)
Micron, ±5%	11/13/15/17/20/23/25/27	
Custom sizes also manufactured on customer request, depending on size.		

FILM PROPERTIES (Typical results) - STD												
Property	Test Method	Unit	11µm STD Mix	13µm STD Mix	15µm STD Mix	17µm STD Mix	20µm STD Mix	23µm STD Mix	25µm STD Mix	27µm STD Mix	Tol.	
Gloss @ 45° (degrees)	ASTM D2457	-	87	89	89	89	90	89	86	87.5	±10%	
Haze	ASTM D1003	%	1.6	1.7	1.8	2.2	2.2	2.5	2.45	2.5	N/A	
Dart Impact (F50)	ASTM D1709	grams (g)	<46.1	<46.1	<46.1	88	106	354	90	90.1	-10%	
Cling force by induced blocking method	ASTM D3354, PTSC method	grams (g)	98	113	116	112	133	125	126	132	-10%	
Tensile load at break	MD	ASTM	N	8.5	11.7	13.8	18	19.2	24.1	17.5	18	-10%
	TD	D882	N	4.8	6.9	7.9	9.8	11.2	15.9	11.2	11.3	-10%
Tensile strength at break	MD	ASTM	Mpa	56.6	60.8	63.6	66.8	61.1	71.4	60	61.3	-10%
	TD	D882	Mpa	30.9	35.7	36.6	38.2	35.9	47.5	30	33	-10%
Elongation at break	MD	ASTM	%	342	452	508	532	585	605	421	421	-10%
	TD	D882	%	821	824	818	852	834	775	740	781	-10%

ASTM = Test results based on the American Society for testing materials.

COMPOSITION

Made from linear low-density polyethylene or LLDPE (FDA Approved)

TESTING PARAMETERS

Test results are based on a standardised product recipe that is used on all products manufactured unless otherwise requested by customer.

SHELF LIFE AND STORAGE CONDITIONS

12 months providing that it is stored in cool dry conditions out of direct sunlight and rain.

PACKAGING

All rolls are individually wrapped and palletised 40 or 100 rolls per pallet. Each roll is marked with a label indicating Manufacturer, Size, Date of Manufacture and Job Number. Unless specified otherwise by customer.

INTENDED USE

This film is suitable for wrapping, covering and binding as secondary packaging, non-food contact. Care should be taken when unpacking the product and fitting onto machine as any mechanical damage may impair the performance of the product.

METHOD OF DISTRIBUTION

Distributed at ambient temperature in dry conditions

COUNTRY OF ORIGIN

South Africa



Conventional Blown Stretch-wrap characteristics are:

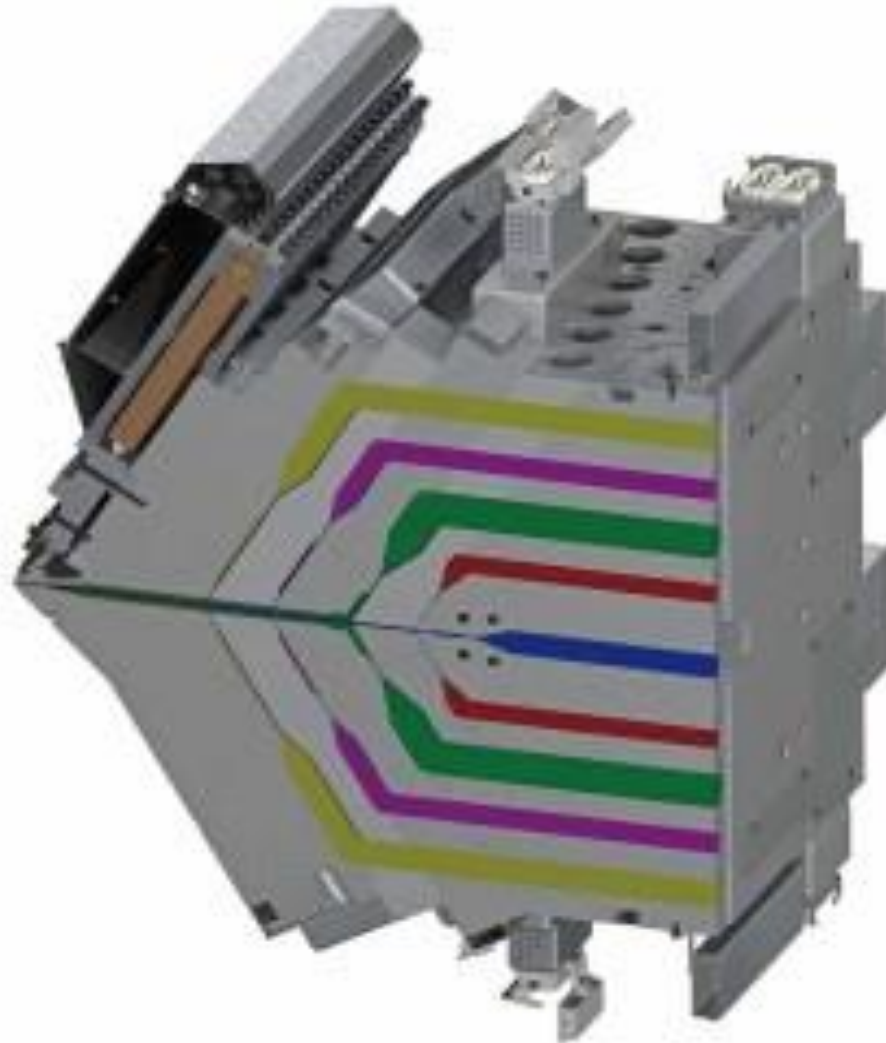
- Hazy, dull in appearance
- Excellent puncture resistance
- Very noisy unwind
- High force on load



Conventional characteristics of Cast Stretch-wrap are:

- Good transparency
- Clear and glossy film
- Superior tear resistance
- Quite unwind
- Consistent cling and film thickness

- 7 Layer
- A 10%
- B 12%
- C 23%
- D 10%
- C 23%
- B 12%
- E 10%



Blown stretch film for hand wrap has one to three layers of butene/hexene LLDPE blends with expensive cling additives that are not used in cast films.

The increased number of layers apply only to cast stretch film machine wrap with improved molecular adhesion between the layers giving the film the following advantages:

- allows for significant film down-gauging, while maintaining the mechanical characteristics of the thicker film.
- superior puncture resistance, which prevents the films from tearing on sharp corners of pallets.
- increases the holding strength of films on wrapped pallets.
- increases the 'Elmendorf Tear' properties (resistance to tear).
- Film with more layers doesn't usually have more different materials. Rather, the additional layers are created in the feed block by splitting one resin stream into thin slices stacked together or alternated with layers from a different resin stream. The technique is commonly used in sheet extrusion to get a more uniform resin distribution.
- Co-extrusion of thin alternating layers can improve puncture strength, extruding metallocene resins thinner actually makes them less splitty—the same way glass, if it's thin enough it is flexible.
- Look at seven layers as like plywood, we get higher pre-stretch, puncture, and tear resistance with seven layers than with five layers.

- Alternating thin layers of mLLDPE also allow greater use of low-cost wide-spec or butene LLDPE and reduce the amount of mLLDPE needed. In a seven-layer film with three mLLDPE layers, the metallocene content might drop to 33% versus as much as 40% mLLDPE spread over two layers of a typical five-layer stretch film.
- While there are thus good reasons for letting the Cloeren feed block create multiple layers from one resin stream, there are also arguments to be made for using more extruders. Coextruding layers of a single resin with two extruders increases throughput of a line but doesn't affect film properties but without blending
- Transpacos seven-layer stretch films is made five extruders plus a small sixth machine that extrudes edge bead out of trim waste, predefined plugs for the feed block allow it to make seven layers with three or four different polymers. It also uses a very large chill roll and quenches the film fast further improving puncture strength and cling.
- Not all highly layered stretch films use mLLDPE noting that TD tear strength is lower with mLLDPE than with standard hexene/octene blends.
- Transpacos newest seven-layer films are high-strength films designed for down gauging on high-speed automated stretch wrappers, the film can wrap at speeds of up to 80 rpm.

- In pallet unitizing, stretch wrap can have several functions.
- Improved stability of products or packages, forming a unit load.
- More efficient handling and storage of unit loads.
- Dust and moisture protection.
- Some degree of tamper resistance and resistance to package pilferage.
- Making sure cartons stay on the pallet is an important consideration in warehouse distribution, especially as the demands for increased throughput continues to rise.
- Stretch wrapping is the most cost-effective way to keep loads secured, on a pallet.



FILM SAVINGS SCENARIOS WITH ROBOPAC WRAPPER							
	ACTUAL WRAPPER + STRETCH FILM XXXXXX		NEW ROBOPAC TECHNOLOGY + STRETCH FILM XXXXX + ARC-1		NEW ROBOPAC TECHNOLOGY + STRETCH FILM YYYYY + ARC-1		
FILM SPECIFIC WEIGHT DENSITY	0.92	g/cm3	0.92		0.92	g/cm3	
REEL HEIGHT	500	mm	500	mm	500	mm	
EXT DIAMETER	250	mm	250	mm	250	mm	
INTERNAL CORE DIAMETER	76	mm	76	mm	76	mm	
NET FILM WEIGHT OF REEL	15046	g	15046	g	15046	g	
FILM THICKNESS	25	micron	25	micron	25	micron	
LOAD LENGTH	1750	mm	1750	mm	1750	mm	
LOAD WIDTH	1150	mm	1150	mm	1150	mm	
REVS OF FILM AROUND PALLET	16		16		16		
% OF PRE-STRETCH	150	%	300	%	350	%	
LINE SPEED	77	pallet/h	77	pallet/h	77	pallet/h	
NUMBER OF SHIFTS PER DAY - HOURS (T1)	16	h/day	16	h/day	16	h/day	
TIME STOP FOR A REEL CHANGE	5	min	1	min	1	min	
WORKING DAYS PER YEAR	250	day/yr	250	day/yr	250	day/yr	
COST OF FILM PER KG	34.29	R/kg	34.29	R/kg	34.29	R/kg	
INFEED WRAPPER BUFFER POSITIONS (*)	1		2		2		
(*) to avoid stops caused by reel change							
FILM USAGE PER PALLET	427	g	267	g	237	g	
REEL DURATION - PALLET	35	pallet	56	pallet	63	pallet	
REEL DURATION - HOURS	0.46	h	0.73	h	0.82	h	
REEL CHANGES PER DAY	35		22		19		
TOTAL TIME LOSS FOR REEL CHANGE (T2)	175	min	22	min	19	min	
TOTAL EFFECTIVE WORKING TIME	13.09	h	15.64	h	15.68	h	
WRAPPER AVAILABILITY (T1-T2)/T1	81.79%		97.72%		97.98%		
FILM USAGE WEIGHT PER YEAR	131,479	kg	82,174	kg	73,044	kg	
FILM USAGE COST PER YEAR	4,508,416	R	2,817,760	R	2,504,676	R	
ESTIMATED COST SAVINGS PER YEAR	0	R	1,690,656	R	2,003,741	R	

- **Banding** is applying multiple wraps of stretch film to reinforce a specific area of a pallet or to band together multiple units.
- **Blown Film Stretch films** manufactured by the blown film extrusion process are called blown films. Stretch film extruded by the blown method typically produces greater puncture resistance but less aesthetic values than cast films.
- **Bottom Wraps** are the rotations a stretch wrap machine makes applying stretch film to the lower portion of a unitized load. Bottom wraps of more than one rotation augment pallet stability.
- **Cast film Stretch films** manufactured by the cast film extrusion process are called cast films. Stretch film extruded by the cast method typically have greater tear resistance, greater aesthetic values and are quiet to unwind, which is not typically found in film manufactured by the blown method.
- **Cling** provides the sticking to self but not to the product attribute. Films will be designed as a single side cling or a two sided cling. The cling bonding agent is typically added in as a single side or two sided layer in the co-extrusion process.
- **Co-extrusion** is the process of taking materials that are; fed, melted and or pumped in through other extruders, which are then merged to create a multi-layer film.
- **Dart Drop** is a technique used to measure the impact strength or sturdiness of a film; this is ascertained bydropping a crescent shaped weight (aka dart) onto a film.

- **Elastic Recovery** is when the stretch film is stretched strained and / or deformed its ability to recover and return to its original form indicates its elastic recovery capacity.
- **Elmendorf Tear** is a testing means for measuring a materials ability to resist tearing forces. This method initiates a tear in a sample material, then measure to the amount of force needed to tear the sample apart. Test result value is referred to as the tear value.
- **Extruder** is a piece of equipment that uses mechanical and thermal actions to change solid polymer into a molten polymer.
- **Film Feed** is the speed at which the film is supplied to the load is the film feed. Film feed rate adjusts as needed on load corners to maintain consistent film tension.
- **Film Force** is applied at a rate of tension in the film, this is called the film force or film tension. The rate is usually measured in kilograms.
- **Film Memory** is the memory of the stretch film trying to return to its original un-stretched form and in the process makes the load tighter and more consistently secure. This prevents loosening of the load that can occur later as the load settles. To achieve optimal film memory and film efficiency, proper film and application settings are essential.
- **Film Tail** refers to the start and end pieces of stretch film that are initially applied and then later cut off from a pallet in the stretch wrapping process.

- **Gauge** is an imperial measurement used to measure stretch film thickness or callipers. An example value would read as: 70 gauge, 80 gauge (+\ -20 micron). Also note: Often used as a synonym for film thickness.
- **Gloss** refers to a surfaces shine or sparkle, in LLDPE stretch films it refers to the amount of light that is reflected from the stretch films surface. High gloss attributes are typically found in cast stretch films.
- **Hand Film stretch** is film used for manual stretch wrap packaging application. Designed for hand wrapping application, hand film rolls are lighter and smaller than machine film rolls to make application easier. Also known as hand wrap, hand stretch wrap and hand stretch film.
- **Haze** refers to lack of clarity and inability to see through a film, it is measured by the percentage of light not transmitted through a film sample a characteristic that is typical of blown stretch films.
- **Impact Strength** is the capability of a stretch film or other material to defy rapidly applied destructive forces.
- **LLDPE Stretch Film** Linear Low Density Polyethylene Stretch Film.
- **Machine Direction** refers to the direction perpendicular to the film width. Acronym: MD.
- **Machine Films** is a stretch film designed for stretch film equipment.
- **Metallocene** is a polyethylene resin developed using "Metallocene" change the polythethylene chain structures resulting in a new breed of stretch films. Metallocene stretch films can achieve increased puncture resistance and clarity while blends offer balanced film properties and universal stretch.

- **Micron** is a metric measurement used for measuring film thickness. One micron is equal to one millionth of a meter.
- **Neck-down** is when a film loses its dispensing roll width / breadth and narrows down while being stretched. Neck-down reduces coverage each wrap provides thereby making it likely that more wrap rotations and more film will be needed to wrap a load or pallet.
- **Overwrap** refers to the amount of stretch film applied over the top of load. Overwrap provides a downward force on a pallet load and is often used to secure a pallet top sheet or corrugated top cap in place.
- **Pallet Covers** is a Poly film cover commonly used to protect pallets from dirt, dust and/or conceal pallet contents.
- **Post-stretching** is stretching a film by using the load to pull the film out at the same time as it applies film. Although this allows for the benefit of film tension, the tension levels are inconsistent and as such can damage many load types. Attempts to attain higher tension stretch can be done but can increase risk of damaging some load types and increase chances of stretch film breakage.
- **Pre-stretching** is stretching the film prior to application. The process can increase film strength, improve load integrity, reduce amount of stretch wrap film needed and save on stretch film packaging costs.
- **Roping** is the bunching the stretch films full width to create a rope. Stretch film roping is extremely strong and is often used to further secure a pallet to its load. Bunching stretch film is a feature function of many stretch wrap machines (ex: turntable stretch wrappers).

- **Tackifiers** are additives used in the material fabrication process to increase the "tack" of the film or material. Also see: cling
- **Tear Resistance** refers to the resistance of the film to tear. Attribute is quantified by measuring the force needed to propagate an initiated tear.
- **Tensile strength** a measurement of the maximum amount of force a material can take without breaking. The greater the tensile stretch measurement, the stronger the material.
- **Tension stretch** is a pulling force that stretches materials. For example: stretching a rubber band will make it longer, as it gets longer its tension increases. Also referred to as post-stretch.
- **Transverse Direction** refers to the direction across the stretch film web, also referred to as TD.
- **Wide web** a specialty sized large film roll designed for equipment that wrap using larger widths.
- **Yield Strength** is the amount of stress a material can withstand without permanently having plastic deformation. Prior to reaching the yield point a material will elastically deform but will return to original shape once the stress is removed.
- **Zippering** refers to the lack of resistance to of an initiated TD tear or cut, once initiated, the tear will rapidly spread.

[07] Contact Information

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A collection of various rolls of white adhesive tape, including large rolls and smaller rolls, arranged on a black background. The rolls are of different sizes and are positioned in a cluster. The text "Thank You" is overlaid in the center in a bright yellow font.

Thank You