

COLLATION SHRINK FILM

HIGH SPEED PACKAGING WITH INCREASED STIFFNESS AND REDUCED THICKNESS

BRALEN+ FC 03-03, BRALEN+ FC 08-13 AND TIPELIN BB 620-17

| MOL GROUP CHEMICALS SOLUTIONS FOR HIGH PERFORMANCE COLLATION SHRINK FILM |

MOL Grade	Product group	MFR 190 °C/2.16 kg	Density 23 °C
Unit		g/10 min	kg/m ³
Test Method		ISO 1133-1	ISO 1183-1
BRALEN+ FC 03-03	LDPE	0.3	927
BRALEN+ FC 08-13	LDPE	0.8	929
TIPELIN BB 620-17	HDPE	0.65	962

Remark: FC 03-03 can be replaced by FC 08-13, depending on customer's film thickness requirements.

ADVANTAGES FOR YOU

- ▶ High transparency and improved cutting and handling on fast packaging shrink film machines
- ▶ Wrinkle-free packaging
- ▶ High film performance on 30 µm
- ▶ High holding force
- ▶ Improved stiffness
- ▶ Good puncture resistance
- ▶ Only PE polymer – easy to recycle, especially when unprinted
- ▶ Financial benefits in terms of cost per collation overwrap and minimising raw material use



PERFORMANCE IN EVERY LAYER

Experimental setup

- ▶ 3-layer blown film
- ▶ 30 and 40 µm thickness
- ▶ Layer distribution 1:3:1 (ABC)
- ▶ Throughput 300 kg/h
- ▶ BUR 3:1

Layer A/C – Outside Layers

- ▶ mLLDPE*
- ▶ LDPE BRALEN+ FC 03-03

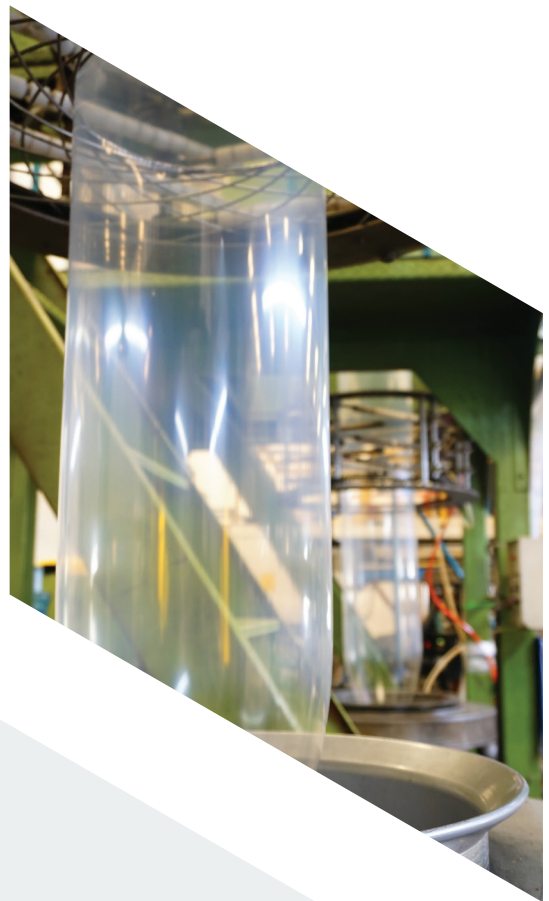
The outside layers provide **holding force**, **toughness** and **puncture resistance**.

Layer B – Core Layer

- ▶ HDPE TIPELIN BB 620-17
- ▶ LDPE BRALEN+ FC 03-03

The core layer provides **shrink** (LDPE) and **additional stiffness** (HDPE) on **downgauging**.

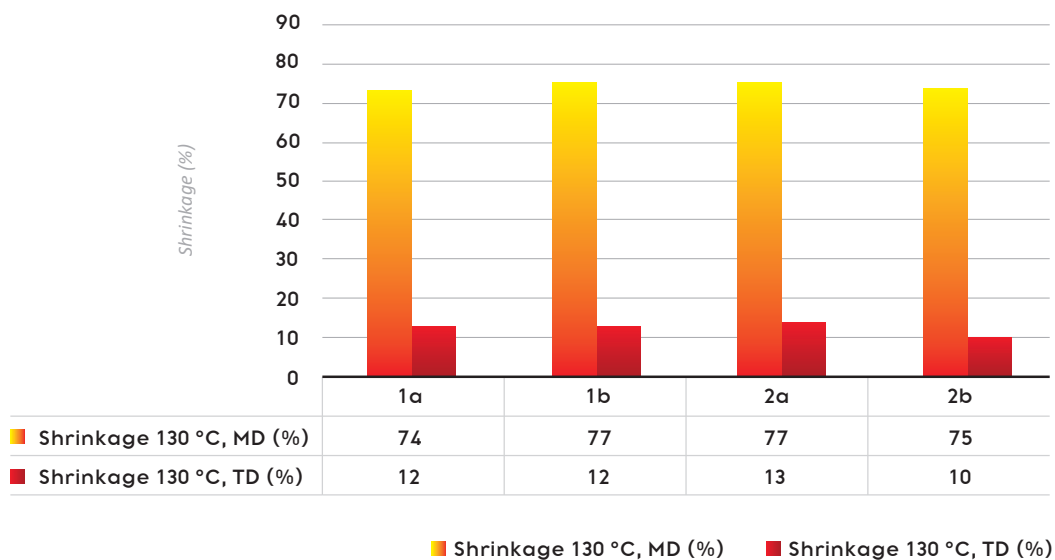
** mLLDPE is a grade from one of the market leaders, recommended with antiblock and slip agent*



Recipe Nr.	Total Film thickness (µm)	A layer = C layer	B layer
1a	40	90% mLLDPE 10% LDPE FC 03-03	20% HDPE BB 620-17 80% LDPE FC 03-03
1b	30	90% mLLDPE 10% LDPE FC 03-03	20% HDPE BB 620-17 80% LDPE FC 03-03
2a	30	90% mLLDPE 10% LDPE FC 03-03	25% HDPE BB 620-17 75% LDPE FC 03-03
2b	30	90% mLLDPE 10% LDPE FC 03-03	30% HDPE BB 620-17 70% LDPE FC 03-03

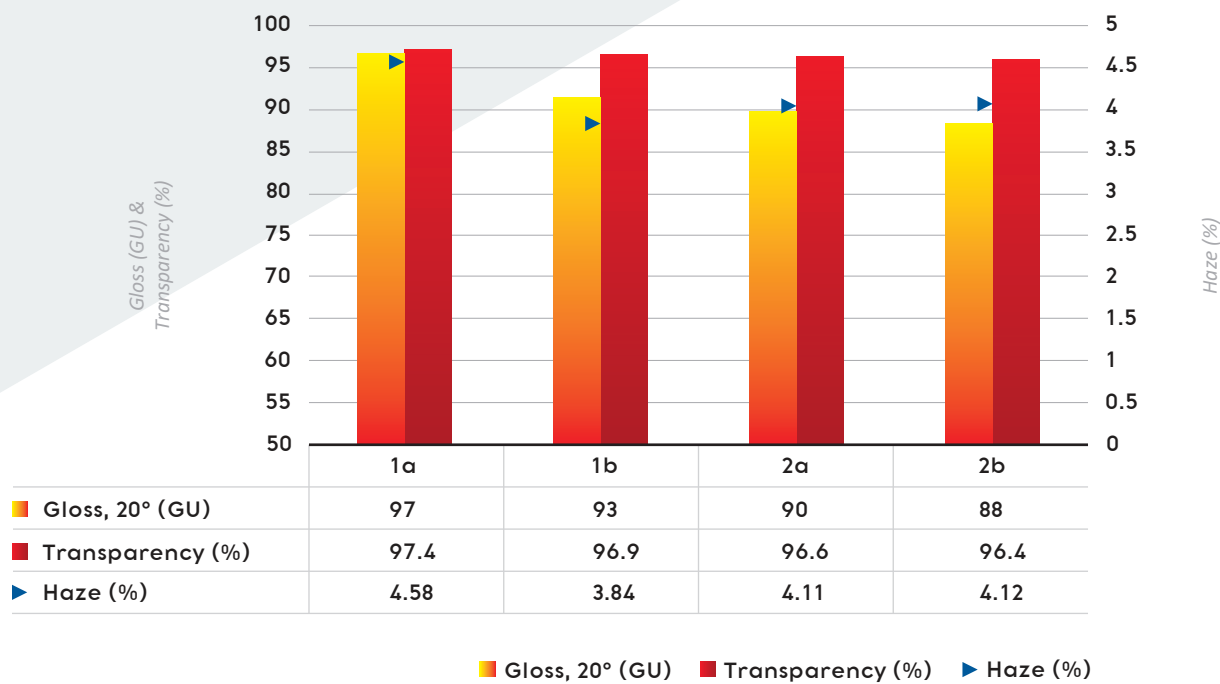
SHRINKAGE

- ▶ Slightly increased shrinkage in MD direction due to film thickness reduction (1a/1b)
- ▶ No negative influence on the shrinkage when increasing share of HDPE BB 620-17 in B layer (2a/2b)
- ▶ Higher BUR (3.5:1 or 4:1) is recommended to increase TD shrinkage values (here BUR 3:1)



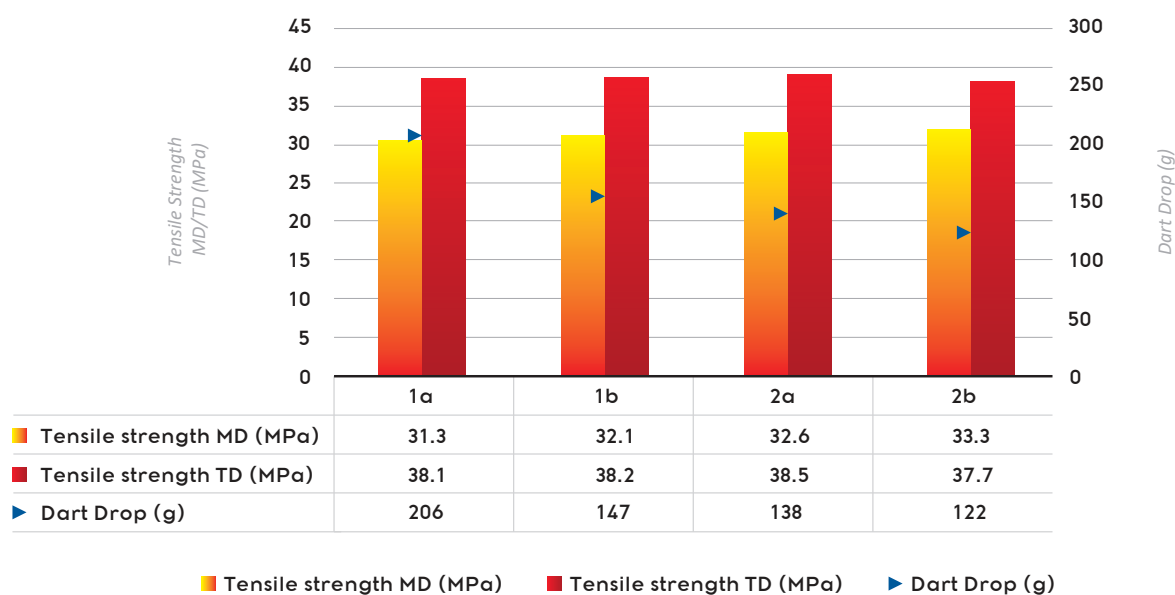
GOOD OPTICAL PROPERTIES

- ▶ Increased level of HDPE BB 620-17 in B layer does not significantly influence the transparency and haze.
- ▶ The reduction of gloss is neglectable



GOOD MECHANICAL PROPERTIES

- ▶ Decreased film thickness from 40 µm to 30 µm has no influence on the tensile strengths.
- ▶ Increased level of HDPE BB 620-17 in B layer keeps the tensile strengths.
- ▶ The dart drop decreased mainly due to film thickness reduction and can be counteracted by the design of the outer layer (higher mLLDPE share).



For further information and technical data sheets, please do not hesitate to contact our market development manager Verena Betz (vbetz@molgermany.de, 0049 151 63410164) or your sales representative.

What about using recycled material in a collation shrink formulation? Our market development managers Judith Smit (Judith.Smit@molgroupitaly.it, 0039 320 220 5654) and Dariusz Lukaszewski (DLukaszewski@molgermany.de, 0049 171 1560066) are always at your disposal.



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