



# Validation Report: COSMO



# Subject: Pack Ready validation test report for COSMO (film supplier) / KARLVILLE trial

**Date:** August 12,  
2020

(Supplier & Product) COSMO SUPREME VELVET - SUBMITTED FOR EVALUATION

## Requirements:

### 1. Roll Details:

In Table 1 list number of rolls, size of rolls and details of all thermal lamination films including product codes, corona treatment, additives (if applicable) etc...

### 2. SAMPLES to be sent to Israel:

- a. 70m (230ft.) of laminated material (see test protocol supplied by HP-Indigo R&D) – **N/A**
- b. Pouching: Karlville to send pouches of the laminated film – **N/A**

## Procedure:

**Roll Details and condition:** Each of the produced rolls underwent an incoming inspection and tested for:

- ▶ Visual inspection: Record general condition and/or any defects (coating quality, visual defects) & Curling
- ▶ Constructions: Each construction shall be listed along with all pertinent details captured in Table 2

**Production /summary:** Run lamination test based on test protocol supplied by HP R&D. fill Table 3 for process parameters.

- ▶ LBS testing: Each construction will be subject to Lamination Bond Strength (LBS) measurements as indicated in the test protocol. LBS measurements will be performed as follows:
  - Immediately after the lamination (to be performed by Karlville)
  - 24 hours after the lamination (to be performed by Karlville)
  - 2-4 weeks after the lamination (to be performed in parallel by Karlville & HP-Indigo R&D @ Israel)



**Table 1 – Roll details:**

Product code	Material	Resin EMA or EVA	Thickness [µm]	Roll width [mm]	Corona treatment [Y/N]	Additives
N/A	<b>SUPREME VELVET</b>	<b>EVA</b>	<b>35.5 µm</b>	<b>750</b>	<b>NOT SPECIFIED ON TDS</b>	<b>N/A</b>

**Table 2 - Production summary & experimental details:**

EXP. #	Printed substrate	Surface / reverse print	TAP substrate	TAP on top or 2'nd	Total Thickness [µm]
<b>RS-015</b>	<b>52.5um clear snack web</b>	<b>Surface</b>	<b>35.5 um Cosmo Supreme Velvet</b>	<b>Top</b>	<b>88 µm</b>

**Table 3 - Process parameters:**

EXP. #	Nip temperature [°C]	Lamination speed [m/min]	Corona on TAP [W]	Corona on print [W]	Wrapping angle [deg.]	Tension print [kg]	Tension tap [kg]	Tension RW [kg]	Tension infeed [kg]	Pressure [Bar] L/R	Pre- Heat [°C]
<b>RS-015</b>	<b>100</b>	<b>60</b>	<b>2.5</b>	<b>2.5</b>	<b>150</b>	<b>10</b>	<b>2</b>	<b>14</b>	<b>14</b>	<b>1.0/1.0</b>	<b>0</b>

**1. Pre-lamination – film inspection remarks:**

- ▶ Curling score (in cm TD and MD): NO CURL
- ▶ Thermal active layer coating quality: GOOD
- ▶ Visual defects: N/A
- ▶ Comments: N/A



2. Post lamination results:

Exp. #	Composition	AVG. LBS [N/in] (Failure mode*)							Visual appearance		
			Left side of hot drum			Right side of hot drum			Curling	Wrinkles	Pinching
			OS			GS					
			Patch 22	Patch 16	Patch 11	Patch 22	Patch 16	Patch 11			
RS-015	PE+PET SNACK WEB/ INK/SUPREME VELVET OPP	T=0	TEAR	TEAR	TEAR	TEAR	TEAR	TEAR	N/A	N/A	N/A
		T=24	TEAR	TEAR	TEAR	TEAR	TEAR	TEAR			

\* The abbreviations of the failure modes stand for the following:

NT – No transfer of ink from the printed substrate to laminated substrate

TT – Total transfer of ink from the printed substrate to laminated substrate

PT – Partial Transfer of ink from the printed substrate (write the percentage of ink remaining on the printed substrate)

PTT – Partial TAP transfer from the Pack Ready film

TTT – Total TAP Transfer from the Pack Ready film to the printed substrate

SBS Test – will be done on strips: 19, 20, 21, 22, 23, 24 – please add Photo of sealing area, for visual appearance:

SBS TESTES CRITERIA

SEAL LAYER	Pass [N/Inch]	Fail [N/Inch]
BOPP	SBS > 4 or <6	SBS <4 or SBS >6

3. Sealing bond strength results:

Exp. #	Composition	Sealable ply	Dwell time [sec]	SBS [N/in]				
				170C	180C	190C	200C	210C
RS-015	PE+PET SNACK WEB/ INK/SUPREME VELVET OPP	PE	0.5	DL	DL	DL	DL	23
			1	21.6	18.4	35.2	38.5	34.6



4. Sealed are appearance:

Exp. #	Composition	Sealable ply	Dwell time [sec]	SBS [N/in]				
				170C	180C	190C	200C	210C
RS-015	PE+PET SNACK WEB/ INK/SUPREME VELVET OPP	PE	0.5	Green	Green	Green	Yellow	Red
			1	Green	Green	Green	Yellow	Red

Color code reflects property rating: ■ Red = Bad ■ Yellow = Moderate ■ Green = Good

COF Test will be done for each laminated sample, and comparison to the non-laminated thermal film

- In HFFS (horizontal form fills and seal) systems, too much friction of the sealant side of the film can lead to film dragging or jamming as it passes over metal plates.
- In VFFS (vertical form fills and seal) systems, too much friction of the sealant side of the film can cause poor film feeding over metal forming collars, inconsistent package sizes, and squealing.

COF TESTS CRITERIA

FFS	Pass	Fail
VFFS - In to in (Seal)	0.20 – 0.30	COF <0.20 or >0.31
VFFS - Out to Out (Print)	0.25 – 0.35	COF <0.24 or >0.36
HFFS - In to in (Seal)	0.20 – 0.45	COF <0.20 or >0.46
HFFS - Out to Out (Print)	0.25 – 0.45	COF <0.24 or >0.46



EXP #: RS-015		IN / IN (SEAL)	OUT / OUT (PRINT)
		KINETIC COF	KINETIC COF
LAMINATED CONSTRUCTION	# 1	0.19	0.60
	#2	0.16	0.58
	#3	0.17	0.70
	#4	0.20	0.60
	AVG	0.18	0.62
	STD	0.02	0.05
TEST ON NON-LAMINATED FILM WILL BE DONE ON EMPTY SIDE			
NON-LAMINATED THERMAL FILM	#1	0.84	
	#2	0.84	
	#3	0.81	
	#4	0.96	
	AVG	0.86	
	STD	0.07	



## Summary:

Results show that the adhesion performance between the digitally surface printed pre-lam 52.5um clear snack web (PE/PET) and the Cosmo Supreme Velvet thermal film exceed the acceptance criteria as per the HP Validation Protocol - *See Table #3 for best working conditions / process parameters.*

- Excellent LBS at low temperatures and high speed.
- At 110C could be laminated @ 75M/min.
- At 120C could be laminated @ 100M/min.
- Bond could not be measured due to tear.
- No curl and great appearance.

Based on the SBS test results and appearance the suggested sealing temperature should be 185C - 190C and 1.0 second dwell time.

Minimal material was used for set-up (48M).

The lamination of Cosmo Supreme Velvet to the surface printed PET/PE pre-lam clear snack web resulted in exceptional bond strength results and no finished curl therefore it has passed the lamination validation process.













**COSMO FILMS, INC.**  
A subsidiary of Cosmo Films Limited, India



## Supreme Velvet Matte Technical Data Sheet

### Description:

Supreme Velvet Matte film is a polypropylene matte film with a scuff resistant surface combined with a very soft feel that protects and enhances the look of books, packages and other printed materials. This film accepts UV spot coating, foil stamping, and animal- and synthetic-based glues. This film is primarily designed for one side laminations.

Note: The use of aqueous coatings over the print is not recommended for best lamination results.

### Typical Properties:

Properties	Typical Values		Test Method
Nominal Film Thickness	mil	1.4	Micrometer
Gloss	60 deg, %	1	ASTM D2457
Lamination Temp. Range		200 – 240°F (95 – 115°C)	Cosmo Films Inc. Method
Surface Tension of Velvet Coating	Dynes/cm	>50	ASTM D5946

This information describes the general properties and uses of the film. In every case, we recommend that the customer determine suitability for their own use by testing prior to production use. This information does not constitute a guarantee or warranty.

All information and specifications are subject to change.



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