

2021  
TRENCHLESS  
MIDDLE EAST

**Protection of CIPP liners and soil through use of pre-liners**  
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MANUFACTURING PROCESS

**Cross Laminated Film Features**

PHASE II  
LAMINATION

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5. Different choices of pre-liners: cross-laminated films pre-liners

**Cross Laminated through 3 Step Process:**

1. Extrusion/Stretching
2. Shifting Strength Orientation
3. Cross-Lamination

- Optimal use of high-quality resins
- 100% HDPE, 100% Recyclable
- Not your standard HDPE blown film process

SIMPLIFIED PROCESS

EXTRUSION    SPIRAL CUT    CROSS LAMINATION

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**Mechanical testing**

Tensile strength

- Determination of tensile strength and elongation in longitudinal direction (MD) and transverse direction (TD)
- Testmethod EN ISO 527

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**Mechanical testing**



Tear resistance

- Determination of tear resistance in longitudinal and transverse (axial and radial ) direction
- Testmethod ASTM D 1004
- Tear initiation and tear propagation



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**5. Different choices of preliners: cross-laminated films preliners**

Comparison table				
Property	Unit	LDPE Pre-liner	Cross-laminated HDPE Pre-liner	Benefits
Thickness	micron	140	100	More flexible & lighter
Tensile strength	axial	16,5	36,3	Less deformation of the pre-liner
	radial	21,9	40,2	
Elongation	axial	140	183	Better balanced film
	radial	20	182	
Tear resistance	axial	14,7	33,8	Less potential damages
	radial	18,6	32,5	
Puncture resistance	N	58	107	Less potential damages
Coefficient of Friction		0.35	0.2	Easier to pull
Melting resistance	°C	110	135	Less risks of melting



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**Mechanical testing**

Puncture resistance

- Determination of puncture resistance
- Testmethod Mil Std 3010 Method 2065



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**Summary**

A cross-laminated HDPE pre-liner will provide to the main liner:

1. An easier & safer installation
2. A temporary waterproofing against water infiltration
3. A better preservation of the soil and ground water
4. A prevention against soil and groundwater contamination
5. A "peace of mind" for the installers



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# Thank you

Comments, feedback, concerns?