

**MACLINE® Geomembranes**  
**MACLINE® ATARFIL HDS**
**Raw Material**
**High Density Polyethylene**
**DESCRIPTION**

**MACLINE® ATARFIL HDS** is a two-colour co-extruded geomembrane manufactured from maximum quality high density polyethylene HDPE resins to which pigments with a UV stabilizer are added. As a result of its colour, the product obtains a high integration with environment, or enhance the superficial appearance of the geomembrane in ornamental applications. Available colours: Green, Blue, Turquoise, Ochre, Grey and White. Other colours under request for minimum orders, indicating RAL code. Thickness of co-extruded layer can be modified.

**MACLINE® ATARFIL HDS** contains 97.5% of pure polymer, and approximately 2.5% of Carbon Black, antioxidant, thermal stabilizers and signal layer in white colour. The product does not contain plasticizers or fillers that can migrate over time. Atarfil guarantees both UV resistance and colour stability for a variable time limit depending on the selected colour.

The geomembrane **MACLINE® ATARFIL HDS** is manufactured under rigorous quality controls.

SURFACE	SMOOTH	COLOUR	BLACK + COLOUR				
		RAL Code	Green 6001	Blue 5012	Ochre 1001	Turquoise 5018	Grey 7040

Raw Material Identification	Tested Property	Unit	Test Method	Value
	Density of Raw Material	g/cm <sup>3</sup>		ASTM D 792
Density of Geomembrane	g/cm <sup>3</sup>		ASTM D 792	0,946 ± 0.004
Melt Flow Index	g/10 min		ASTM D 1238 (190°C/5 Kg)	≤ 1,30
Carbon Black Content	%		ASTM D 4218	2,0 - 2,5

  

Durability	Tested Property	Unit	Test Method	Value
	Oxidative Induction Time (OIT)	min		ASTM D 3895 (200°C)
Stress Crack Resistance/NCTL	h		ASTM D 5397	≥ 600
Oven aging at 85°C (min. ave.)	%		ASTM D 3895	≥ 55
UV Resistance. High Pressure OIT - % retained after 1600 hrs	%		GM 11 / ASTM D 5885	≥ 70
Oxidation	%		UNE EN 14575	≤ 15

Functional Properties	Tested Property	Unit	Test Method	Value
	Low Temperature Brittleness (t <sub>8</sub> : -40°C)	-		UNE EN 495-5
Water Permeability	m <sup>3</sup> /m <sup>2</sup> ·day		UNE EN 14150	< 1·10 <sup>-6</sup>
Coefficient of Linear Thermal Expansion	1/K		ASTM D 696	2,15·10 <sup>-4</sup>
Water Absorption	%		ASTM D 570 (24h)	0,1
			ASTM D 570 (6 days)	0,1
Thickness of Co-extruded Layer	%		ASTM D 5199	50
Asperity Height	mm		ASTM D 7466	-

Strength Characteristics Quality of Final Product	Tested Property	Unit	Test Method	Value				
	Thickness	mm		ASTM D 5199	1.00	1.50	2.00	2.50
Medium thickness tolerance				± 5				
Punctual minimum thickness Tolerance	%		-	± 10				
Tensile Properties <sup>(1)</sup>								
Tensile strength at Yield	N/mm		ASTM D 638 (Type IV)	18 (16)	26 (24)	35 (32)	44 (40)	53 (48)
Elongation at Yield	%			12				
Tensile strength at Break	N/mm			31 (26)	47 (39)	62 (52)	78 (65)	94 (78)
Elongation at Break	%			800 (700)				
Tear Resistance	N		ASTM D 1004	135	202	270	337	405
Puncture Resistance	N		ASTM D 4833	> 320	>480	>640	>800	>960
Exploding Resistance	%		pr EN 14151	> 15				
Dimensional Stability	%		ASTM D 1204 (100°C, 1h)	± 1,5				

190713	PRESENTATION (Standard Sizes)	Parameter	Units	1,00	1,50	2,00	2,50	3,00
		Roll width	m	7.5	7.5	7.5	7.5	7.5
Roll Length	m	210	140	105	84	70		
Surface	m <sup>2</sup>	1575	050	787	630	525		

(1) Values indicated are MEDIUM. In brackets values with 95% confidence level.

(2) Certificates belonging to the Environmental and Quality Integrated System of Atarfil.

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