

## MACLINE RMH & RDH HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANES

**MacLine RMH & RDH** is a high density geomembrane (with one or both surface roughened <sup>a</sup>sand paper like) manufactured from maximum quality polyethylene resins, duly contrasted, that comply with the most rigorous requirements established for their use.

Geomembrane **MacLine RMH & RDH** contains not less than 97% of pure PE polymer and a balance not higher than 3% of carbon black, antioxidants and thermal stabilizers. The product does not contain plasticizers or fillers that could migrate over time.

Geomembranes **MacLine RDH** (both faces roughened) and **RMH** (only one face roughened) have similar properties to the standard smooth products; the density of the added polymer to achieve the roughness can range from 40 to 140 gr/m<sup>2</sup> on request.

Geomembranes **MacLine RMH & RDH** are manufactured under permanent quality control and comply with national and international standards.

SURFACE: M roughened one side - D roughened 2 sides RAW MATERIAL CHARACTERISTICS			
Property	Unit	Test Method	Value
Density in white	g/cm <sup>3</sup>	EN ISO 1183-1	>0.934
Membrane density	g/cm <sup>3</sup>	EN ISO 1183-1	>0.940
Melt flow index	g/10min	EN-ISO 1133,190/5.0 ASTM D1238, 190/5,0	< 3
Carbon black content	%	ASTM D 4218	2.5
Carbon black dispersion	--	ISO 11420	3

COLOUR: BLACK RAL CODE: -			
FUNCTIONAL PROPERTIES			
Property	Unit	Test Method	Value
Low temperature brittleness	-	ASTM D746/B	-40
Water absorption	%	ISO 1269	< 0.05
Linear thermal expansion coefficient	cm/cm/°C	ASTM D 696	<2x10 <sup>-4</sup>
Water permeability Gas permeability	m <sup>3</sup> /m <sup>2</sup> x day	EN 14150 ASTM D1434/82	<1.75x10 <sup>-6</sup> 3.3x 10 <sup>-3</sup>
Asperity height (1)	mm	GRI GM 12	-
Fire resistance	-	ISO 11925-2	E

DURABILITY UV RESISTANCE			
UV Resistance	-	-	yes
Oxidative Induction Time (OIT)	min.	ISO 10837	80
Stress cracking resistance (ESCR)	h	ASTM D 5397 ASTM D1693 - Cond.B	>200 > 2000

GEOMEMBRANE PHYSICAL-MECHANICAL PROPERTIES			MACLINE RDH & MACLINE RMH					
Tested Property	Unit	Test Method	075	100	150	200	250	300
Thickness	mm	EN 1849-2	0.75	1.00	1.50	2.00	2.50	3.00
Tolerance	%	-	±10					
<b>Tensile properties (*):</b>								
• Tensile strength at yield	N/mm	EN-ISO 527 Tipo V	13(12)	18(16)	27(24)	36(32)	45(40)	54(48)
• Elongation at yield	%		11	11.5(>9)	11.5(>9)	11.5(>9)	11.5(>9)	11.5(>9)
• Tensile strength at break	N/mm		25(22)	30(28)	45(42)	60(56)	75(70)	90(84)
• Elongation at break	%		600	800(>700)	800(>700)	800(>700)	800(>700)	800(>700)
Static CBR puncture resistance	kN	EN ISO 12236	>2.0	3.5 (3.0)	3.8 (3.3)	5.5 (5.0)	6.3 (5.8)	6.5 (6.0)
Tear Resistance	N/mm	ASTM D1004	110	150	200	300	350	400
Biaxial elongation	%	prEN14151	20	20	20	20	20	30
Dimensional stability (120 °C/hr)	%	DIN 53377	<1					

(\*) Values in brackets are AVERAGE MINIMUM values. The rest are NOMINAL .

For the optimisation and improvement process of the technical characteristics of the products, the producer reserves the factibility to modify standard and characteristics at the product without any warning. The information contained herein is to the best of our knowledge accurate, but since the circumstances and conditions in which it may be used are beyond our control, we do not accept any liability for any loss or damage, however arising, which results directly or indirectly from the use of such information nor do we offer any warranty or immunity against patent infringement

### Officine Maccaferri S.p.A.

Via Kennedy, 10 - 40069 Zola Predosa (BO) - Italy  
Tel. (+39) 051-6436000 - Fax (+39) 051-6436201  
E-mail: comes@maccaferri.com - Web site: www.officinemaccaferri.com

Bureau Veritas Certified Quality System Company  
with SINCERT's and UKAS' s accreditation.