



**EcoPiren**

By Brucite+



## **Recommendations**

EcoPiren® for bitumen roofing membranes

# Description and application

EcoPiren® is a natural magnesium hydroxide obtained by separation and milling of brucite mineral.

The content of main component  $Mg(OH)_2$  depends on the grade and is up to 96 %.

EcoPiren® appears as white or off-white powder and is used as a flame retardant filler for cable compounds of various nature — EVA, PE, PVC; Aluminum Composite Panels (ACP including A2 grade); roofing membranes (TPO, PVC, bitumen); engineering plastics for partial replacement of brominated Flame Retardants.

Incorporating EcoPiren® allows to diminish drawbacks of classic formulations: lack of fire performance, dripping, high smoke emission.



## How does EcoPiren® work?

Exposed to heat, EcoPiren® decomposes emitting water vapor, forming strong char and absorbing heat.

Such behavior provides elimination of oxygen from reaction area, protection for undamaged parts and cooling of the specimen.

Thus minimum damage is inflicted to the specimen.

# Application

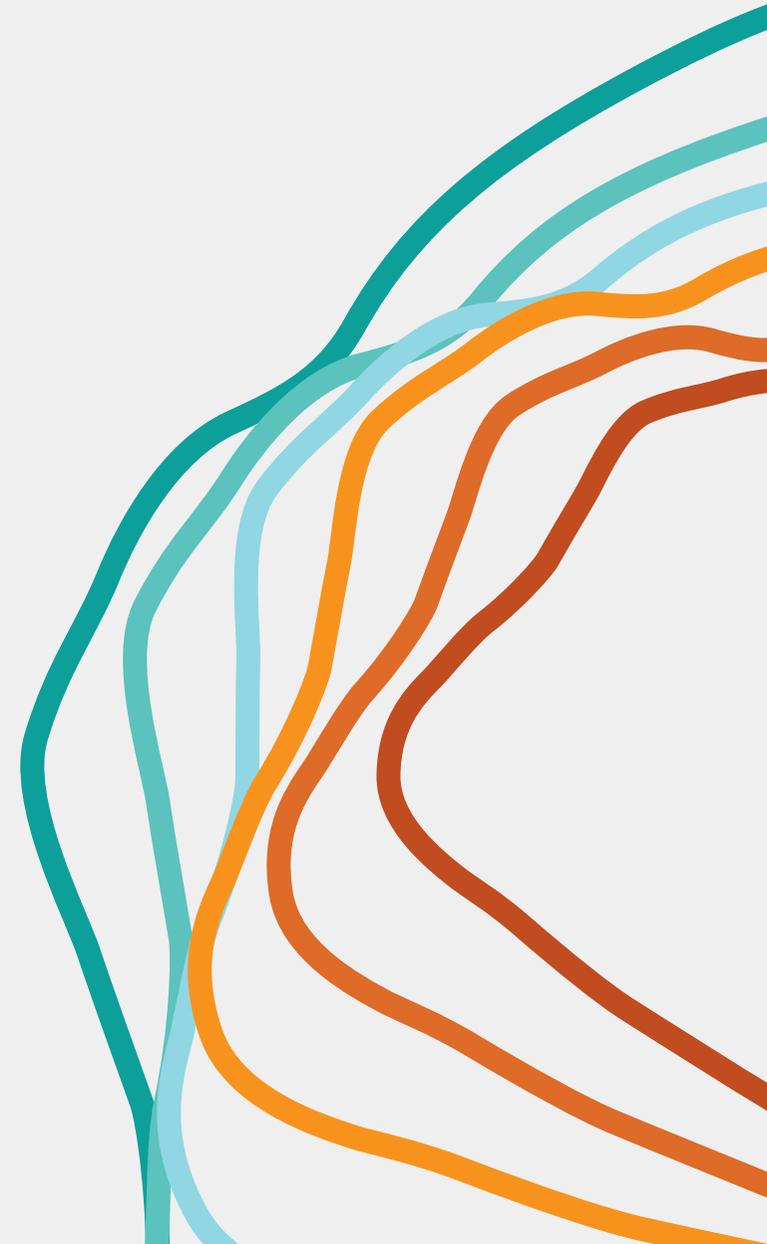
One of the mineral filler's most crucial characteristics is its humidity. Every EcoPiren® grade is packed in the way excluding any possibility of environmental water consumption.

The most common bitumen roofing membranes are APP and SBS modified. SBS provides outstanding flexibility and is mostly used in northern countries.

APP incorporates high ageing resistance and slightly better behavior at low temperatures and thus is common for southern countries.

Both bitumen and polymers are flammable. Roofing materials made of them without flame retardants spread flame vigorously and create dense toxic smoke and flaming drops. To prevent such behavior bitumen has to be filled with flame retardants.

Building standards in most countries demand roofing materials to be certified in compliance with EN13501-5 as B<sub>roof</sub>. Additionally, smoke evolution has to be limited in accordance with S1 class. Basic formulations of APP and SBS modified bitumen roofing membranes with different flame retardants are presented below.



# Application

- Calcium Carbonate (formulation 8) does not provide flame retardancy at all.
- 35–40% of EcoPiren® is enough to provide sufficient flame retardancy for the membrane (Broof).
- No difference in cold flexibility for all the flame retardants.
- EcoPiren® being very thermally stable and efficient is the best choice as a flame retardant for APP modified bitumen roofing membranes.

*Table 1. APP modified bitumen roofing membrane*

Component	1	2	3	4	5	6	7	8
Bitumen 160/220 API	55	55	50	45	45	45	45	45
Vestoplast 891	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Adflex H101X	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Colemanite	35			40				
Colemanite + ATH		35			40			
EcoPiren® 10R			35			40		
EcoPiren® 200							40	
CaCO <sub>3</sub>								40
<b>Total</b>	<b>100</b>							
<b>Properties</b>								
Brookfield viscosity (190 °C), cps	15000	14400	15000	18000	23500	26750	21500	18500
Ring and Ball, °C	145	144	145	146	148	148	147	148
Penetration (100 g/25 °C), dmm	19	20	23	24	19	19	21	20
Penetration (50 g/60 °C), dmm	55	56	52	55	48	48	50	47
Cold Flexibility, °C	0	0	0	0	0	0	0	0
<b>Burning tests</b>								
Time to dripping, min	8:50	7:50	7:15	never	never	never	never	3:30
Time to flame stop after removal of fire, s	20	15	25	15	15	15	15	120

# Application

- Calcium Carbonate (formulation 5) does not provide flame retardancy at all.
- Combination of EcoPiren® and ATH (formulation 6) shows synergism and provides highest flame retardancy for SBS type of membranes. ATH promotes fast char formation and EcoPiren® strengthens and stabilizes its structure.
- Combination of EcoPiren® and ATH speeds up the filler dispersion in bitumen.

*Table 2. SBS modified bitumen roofing membrane*

Component	1	2	3	4	5	6
Bitumen 160/220 API	55	55	55	55	55	55
SBS Radial	8	8	8	8	8	8
Adflex H101X	2	2	2	2	2	2
Colemanite	35					
Colemanite + ATH		35				
Milled ATH			35			17.5
EcoPiren® 10R				35		
CaCO <sub>3</sub>					35	
EcoPiren® 200						17.5
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Properties</b>						
Brookfield viscosity (190 °C), cps	26.50	30.00	22.00	32.00	29.00	27.50
Ring and Ball, °C	118	120	118	120	119	119
Penetration (100 g/25 °C), dmm	24	25	28	25	26	26
Penetration (50 g/60 °C), dmm	55	65	66	64	68	65
Cold Flexibility, °C	-15	-15	-15	-15	-15	-15
<b>Burning tests</b>						
Time to dripping, min	3:25	5:45	2:45	2:15	2:15	5:05
Time to flame stop after removal of fire, s	20	<15	<15	<15	<15	<15

# EcoPiren® advantages

- Very high concentration of magnesium hydroxide part in comparison with other brucite based products.
- High thermal stability of EcoPiren® gives the possibility to increase the temperature of bitumen and hence to speed up the polymer dissolution process.
- Prevents flaming drops formation.

By choosing EcoPiren® products you ensure best technical support for application of product and receive a possibility to develop a custom solution with individual properties.

**Please contact us via request form.**



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