

DIFFERENCE BETWEEN SHEET-BASED MEMBRANE AND LIQUID-BASED MEMBRANE FOR WATERPROOFING

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INTRODUCTION

In a tropical country like Malaysia, where the weather is hot and rain occurs frequently, this can cause concrete cracks due to the continuous expansion and contraction of the concrete from the temperature change. Even though some of these cracks are very minor, water still can seep through the concretes easily and thus causing leakage. To add extra protection against water leakage, membranes can be generally used in roofs, toilets, or any other structures that require waterproofing effects or weather protection. The two types of membranes are sheet-based membranes and liquid-based membranes. Both types of membranes have their pros and cons and will be further discussed in this article.

WHAT IS SHEET-BASED MEMBRANE?

A sheet-based membrane is in a form of sheet rolls. It can be made of bitumen, thermoplastic, thermosetting material or rubber. Sheet-based membranes are differentiated by the way it adheres against the surface, such as follows ^[1]:

- Torch Applied Membrane
 - Requires a heated torch to melt the layer onto the surface.
 - The melt membrane is very adhesive and can stick firmly to the surface when it cooled.



Image 1: Torch-Applied Membrane ^[3]

- Self-Adhesive Membrane
 - Covered by a release liner, which is to be removed when applying on the surface.
 - Cold-applied alternative which is safer during the application work.

WHAT IS LIQUID-BASED MEMBRANE?

A liquid-based membrane comes in a liquid form as the name suggested. It can be applied through a roller, spray, or brush. When the membrane is dried up, a waterproofing layer will be formed. The liquid-based membrane may be used to heal leaks and cracks due to its capability to blend into the applied surface. Some liquid-based membranes are ^[1]:

- Water-based
 - Typically takes the form of water, which is non-toxic.
 - Solvent-based
 - Typically takes the form of a chemical solvent to have chemical reactions when exposed to air.

- Polyurethane
 - An elastic waterproofing membrane which is made of high polymer material enhanced with a certain quantity of modifier.
 - Good resistance to abrasion, chemical, UV, and bio-degradation.

- Cementitious based
 - Needs to be mixed with the right proportions of cements, water, and aggregates before applying to the surface, but it is vulnerable to joints and cracks.
 - It also required enough membrane thickness to ensure excellent waterproofing quality.
 - It is a kind of modified cementitious product, made by incorporating polymer additive.
 - The polymer fills the pores in the concrete mix to make it more watertight, durable, and increase its tensile strength.



Image 2: Liquid-Based Membrane ^[4]

DIFFERENCE BETWEEN INSTALLATION TIME, COST, AND EASE OF INSTALLATION

Differences	Sheet-Based membrane		Liquid-Based Membrane	
	Pros	Cons	Pros	Cons
Installation time	Generally does not obstruct other workers as much as the liquid-based membrane does due to its lesser installation time and the flexibility to do in sections ^[2] .	-	-	Require drying time, which can delay the process of installation especially when multiple layers are required ^[1] .
Cost	-	Installation can be labour intensive and may cost more than the liquid-based membrane ^[1] .	Generally, does not require much labour and techniques, therefore costing lesser.	-
Ease of installation	Since the sheets roll comes with a constant thickness, it guarantees a uniform thickness of the membrane layer ^[1] .	Need to cut according to different shapes and sizes of the surface, and require skilful workmanship to seal the joints and seams properly ^[1] . Even though the sheets layer is uniform, overlapping of the sheets should be noted as it can cause some difference in thickness ^[1] .	The liquid-based membrane can cover tight corners and spaces for full coverage of the surface ^[1] . It can be easily installed as the liquid-based membrane can spread uniformly throughout the surface with the use of brushes, rollers, or spray ^[1] .	If the surface applied is uneven, the liquid-based membrane will be difficult to distribute evenly throughout the surfaces ^[1] . Since it is liquid-based, bubbles might be formed during the process of drying, leading to incomplete coverage, where leakage can occur ^[1] .

CONCLUSION

Overall, neither one of them is better than the other as long as it works well in both weather and waterproofing. To choose the most suitable option of the membrane, it all depends on the type of projects, weather, time allowance, budget, development conditions, and requirements.

References:

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