



PURPOSE

Test the performance capabilities between Adeka Ultra Seal MC-2010M and bentonite based products under different conditions (increasing pressure and joint opening).

COMMENTS

Adeka Ultra Seal MC-2010M is manufactured from natural rubber with the addition of a liquid hydrophilic urethane pre polymer. The hydrophilic agent becomes an integral part of the product. It cannot be easily removed. Bentonite based products are a mixture of bentonite and other substances such as butyl rubber. The product may disintegrate when in contact with water for a period of time. This can lead to a failure of the waterstop. Cannot expect long term durability.

TEST SAMPLE

1. Adeka Ultra Seal MC-2010M (size: 20mm X 10mm embedded stainless steel mesh)
2. Bentonite based products (size: 20mm X 10mm - purchased in USA)

TEST METHOD

Cast MC-2010M and bentonite based products into concrete test blocks. Introduce water to the joints for 300 days (@ 8 kgf/cm² - 113.6 psi - 262 ft. hd). See the attached chart. After 300 days, open the joint 5mm (0.197 inches) and increase hydrostatic head to compare waterstopping performance. See attached chart.

COMMENTS ON TEST RESULT

While the joint was stable with no movement (the first 300 days), both products performed well. No leaks at 8 kgf/cm² - 113.6 psi - 262 ft. hd. The joints leaked when they were opened 5mm and pressure applied up to 2 kgf/cm² - 28.4 psi. **HOWEVER THE JOINT WITH THE MC-2010M STOPPED LEAKING AFTER A PERIOD OF TIME. THE BENTONITE SEALED JOINT DID NOT STOP LEAKING.** Note the results on the chart. The bentonite product failed because of the breakdown in the product's structure. The product could not recover its waterstopping function. Note attached chart.

The test proves the superiority of Adeka Ultra Seal MC-2010M as compared to bentonite products.

Call your local Adeka Ultra Seal Representative or (800) 999-3959 for more information.



TEST RESULT

| Days | | MC-2010M | Bentonite Based |
|------|--------------------------------------|----------|-----------------|
| 300 | 0mm opening 8 kgf/cm ² | No leak | No leak |
| | 5mm opening 2 kgf/cm ² | Leak | Leak |
| 314 | 2 kgf/cm ² | NO Leak | Leak |
| 353 | 2 kgf/cm ² | NO Leak | Leak |
| | 2 kgf/cm ² | NO Leak | Leak |
| | 3 kgf/cm ² | NO Leak | Leak |
| | 4 kgf/cm ² | NO Leak | Leak |
| | 5 kgf/cm ² | NO Leak | Leak |
| 456 | 6 kgf/cm ² | NO Leak | Leak |
| | 7 kgf/cm ² | NO Leak | Leak |
| | 8 kgf/cm ² | NO Leak | Leak |
| | 9 kgf/cm ² | NO Leak | Leak |
| | 10 kgf/cm ² | NO Leak | Leak |

Conversion Factors

| kgf/cm ² | psi | Ft lbs H ₂ O |
|---------------------|--------|-------------------------|
| 2 | 28.44 | 65.6 |
| 3 | 42.66 | 98.4 |
| 4 | 56.88 | 131.2 |
| 5 | 71.11 | 164.0 |
| 6 | 85.32 | 196.8 |
| 7 | 99.54 | 229.6 |
| 8 | 113.76 | 262.4 |
| 9 | 127.98 | 295.2 |
| 10 | 142.20 | 328.0 |

Comparison table ADEKA ULTRA SEALS & Others

| | Waterswelling rubber, ADEKA ULTRA SEAL products | Bentonite type B | Bentonite type C |
|--------------------------------|--|--|--|
| Main Component | Natural rubber, waterswelling polyurethane | Bentonite, oil | Bentonite, Butyl rubber |
| Water swelling | Yes | Yes | Yes |
| Tensile strength when swelling | Yes(maintain its structure) | No (break down its structure) | No (break down its structure) |
| Mechanism | Stop the water by expansion pressure | Stop the water by filling the gap with the collapsed structure | Stop the water by filling the gap with the collapsed structure |
| unit length | 25m/case | 1m (plural butt joints may cause the water path) | 5m(plural butt joints may cause the water path) |
| Application | Applicable on both dry, wet surface. | Applicable wet surface only. | Applicable on both dry, wet surface. |
| Rain | Not affected by the sudden rain. The shape will return to original when it is dry condition. | Rain may increase the break down the structure. The shape will not return to the original. | Rain may increase the break down the structure. The shape will not return to the original. |
| Pressure | More than 5kgf/cm ² | Leakage may occur even in lower pressure. | Leakage may occur even in lower pressure. |
| Opening | Joint opening is not affected the performance | Lower performance is anticipated in case of opening. | Lower performance is anticipated in case of opening. |
| Durability | Long durability maintaining the swelling | Long term durability can not be expected due to breaking down its structure. | Long term durability can not be expected due to breaking down its structure. |