



#### Concrete will crack!

One of the properties of concrete is that it will always crack. With a good design and good application, this cracking can be reduced but even the little (hair) cracks can cause big problems. Cracked concrete has poor water and freeze-thaw resistance. Also, the durability of cracked concrete will be greatly reduced. Through the cracks, moisture and oxygen is able to reach the steel reinforcement which can cause the steel to corrode, causing serious damage to the concrete structure.

Basilisk Self-healing concrete is developed at the Delft University of Technology and is based on an autonomous repair system made possible by limestone-producing micro-organisms (bacteria). When the bacteria come in contact with oxygen and water, they are capable of converting certain nutrients to calcium carbonate (limestone).

When in presents of water, oxygen and nutrients the bacteria will start to multiply. This will insure a wide dispersion of bacteria inside the entire crack. The widely dispersed bacteria will start to convert the present nutrients into calcium carbonate (limestone), which will eventually seal the crack. The formation of limestone the crack is autonomously repaired, thus increasing the durability of the concrete structure.

#### 混凝土是會破裂的！

在日常生活中，我們經常發現破裂的混凝土。雖然良好的設計和應用，可以減少混凝土的裂紋，但是也會出現微小的（毛髮）裂紋。事實上，微小的（毛髮）裂紋是引起大問題的源頭。破裂混凝土會大大降低防水效能，及耐用性。水分和氧氣會沿裂縫，到達鋼筋，並導致鋼筋腐蝕。這可能會對混凝土結構造成嚴重破壞。

自行修復混凝土是由荷蘭代爾夫特理工大學研發的。自行修復系統是利用特定的微生物（細菌），產生石灰石。當細菌與氧氣和水接觸時，它們便能夠將營養物質轉化為碳酸鈣（石灰石），填補混凝土的裂紋。

水和氧沿裂紋進入混凝土。當在水，氧氣和營養物質的存在時，細菌將開始繁殖。細菌將營養物轉化為碳酸鈣（石灰石），最終將混凝土裂縫密封。這樣便達到自行修復，及增加了混凝土結構的耐久性。

For further details: 附加資料:

[http://www.cic.hk/cic\\_data/files/CITAC/Exhibit/Stage%201/Bumatech/Basilisk\\_flyer\\_agent-website.pdf](http://www.cic.hk/cic_data/files/CITAC/Exhibit/Stage%201/Bumatech/Basilisk_flyer_agent-website.pdf)

[http://www.cic.hk/cic\\_data/files/CITAC/Exhibit/Stage%201/Bumatech/Basilisk\\_flyer\\_liquid-website.pdf](http://www.cic.hk/cic_data/files/CITAC/Exhibit/Stage%201/Bumatech/Basilisk_flyer_liquid-website.pdf)

[http://www.cic.hk/cic\\_data/files/CITAC/Exhibit/Stage%201/Bumatech/Basilisk\\_flyer\\_mortar-website.pdf](http://www.cic.hk/cic_data/files/CITAC/Exhibit/Stage%201/Bumatech/Basilisk_flyer_mortar-website.pdf)

[https://www.youtube.com/watch?time\\_continue=106&v=WUsDqArwEd8](https://www.youtube.com/watch?time_continue=106&v=WUsDqArwEd8)

[http://www.cic.hk/cic\\_data/files/CITAC/Exhibit/Stage%201/Bumatech/MSDS\\_ER7\\_Acetate.pdf](http://www.cic.hk/cic_data/files/CITAC/Exhibit/Stage%201/Bumatech/MSDS_ER7_Acetate.pdf)

<http://www.basiliskconcrete.com/?lang=en>

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## 自動修復混凝土

### Self-healing concrete

#### Background of technology

#### 技術資料

##### Applications

- Tunnel elements
- Liquid-containing reservoirs
- Basement walls
- Subsurface constructions
- Marine constructions
- Bridge- and parking decks
- Flooring systems

##### 應用

- 隧道
- 水庫
- 地庫牆壁
- 地下建築
- 海上建造工程
- 橋樑和停車場
- 地板

##### Benefits

- Increase durability of the concrete structure
- Non-flammable and nonexplosive
- Enhance water and freeze-thaw resistance
- Reduce maintenance costs
- Reduce discomfort due to maintenance

##### 優勢

- 增加混凝土耐用度
- 不易燃的及不易爆炸的
- 增加防水性及抗凍融性
- 減少維修費用
- 減少維修帶來的不便