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Basilisk info sheet no. 1:

Crystalline products

Crack repair products for concrete

Concrete has only a small resistance against tensile strength. That is why we add reinforcement to the concrete. This reinforcement however can have a negative effect on the durability of the concrete structure especially if water and aggressive type of salts attack the steel reinforcement by corrosion. Therefore, we need to avoid cracks in durable concrete.

There is a well-known theory that concrete can heal cracks autonomous without any special admixture. This theory is called after his researcher Lohmeijer (*). It says that cracks will heal under the following conditions:

- The crack width has a maximum of 0,2 mm
- The concrete is rather new (no carbonatation)

Sometimes we have enough confidence in the principles of Lohmeijer, however sometimes we must to do something extra.

Crystalline admixtures

There are several brands of crystalline admixtures for concrete. All those products claim self-healing of concrete cracks. The bottom line is that cracks will only heal under the following conditions:

- The crack width has a maximum 0,3 mm.
- The concrete is rather new (no carbonatation) for short period after the application.

There is no scientific proof of healing performance in the cracks > 0,3 mm using crystalline products.

Basilisk Healing Agent

Healing Agent of Basilisk is an admixture that creates an external source of limestone. Therefore, the capability to heal cracks is by far better. Healing Agent will heal cracks under the following conditions:

- The crack width has a maximum of 1,0 mm.
- It doesn't matter if the concrete is old or new.

Professor H.M. Jonkers and his team of The University of Technology in Delft (The Netherlands) has invented self-healing concrete with limestone producing bacteria. The invention is patented 4 times(**). There is scientific proof that there is limestone production in cracks and the can heal cracks up till 1,0 mm. The admixture Healing Agent has a much better performance than any type of crystalline product (Penetron, Kryton, Xypex, Vandex, etc).

Other positive side effects of HA;

- During the healing process the active micro-organism consume oxygen. This will decrease the corrosion process during the process of autonomous crack repair.
- HA will slower the cement-hydration during the first 3 days after application. This will lead to a decrease of shrinkage cracks.

Pricing

The price: Healing Agent will cost approximate the same as crystalline products. However:

- The same amount of HA will double the crack repair capacity.
- Concrete with HA will repair cracks after 10, 20 or even 50 years after applying the concrete.

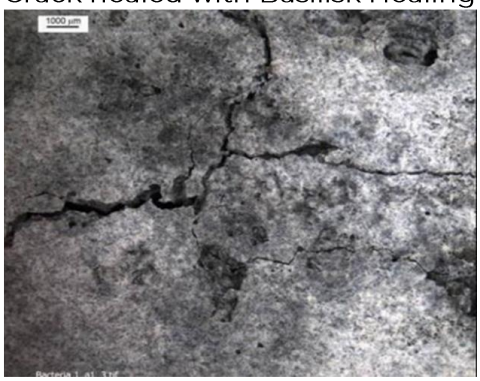
Conclusion

Small cracks (< 0,2 mm) may heal autonomous without adding any admixture. However, this is not always the case, so there is a risk that small cracks will occur, and the will become bigger in the future.

Cracks up to 0,3 mm may heal with a crystalline product, however the concrete must be fresh and there is no scientific proof whether it works. In the best case you pay a lot of money for only covering cracks in new concrete between 0,2 and 0,3 mm.

Cracks from 0,0 till 1,0 mm will heal with Basilisk Healing Agent. Even when cracks that occurs 40 years after building the construction.

Crack healed with Basilisk Healing Agent



Before

After

(*) Lohmeijer
Concrete has an autogenous healing capacity as unhydrated cement is present in the matrix. When water contacts the unhydrated cement, further hydration occurs. Furthermore, dissolved CO2 reacts with Ca2+ to form CaCO3 crystals. These two mechanisms, however, may only heal small cracks

(**) Patents of Basilisk

1. OCT-07-054: HEALING AGENT IN CEMENT-BASED MATERIALS AND STRUCTURES, AND PROCESS FOR ITS PREPARATION Publication WO/2009/093898
2. OCT-10-010: HEALING AGENT FOR SELF-HEALING CEMENTIOUS MATERIAL; Publication WO/2011/126361
3. OCT-12-066: BIO-BASED REPAIR METHOD FOR CONCRETE; Publication WO/2014/185781
4. OCT-14-049: PROCESS FOR THE PRODUCTION OF CEMENTITIOUS MATERIAL; Publication WO/2016/010434