



CASE STUDY

CRONIFER MOERDIJK

Cronifer is a large metal recycling company in Moerdijk. Cronifer needed a highly stable, liquid tight floor for their outdoor handling and storage area. Documented resistance to impact from heavy trucks and shovels made a C-Fix/carbon asphalt concrete floor the most suitable solution.



The project at Cronifer Moerdijk:

Based within the industrial area of the Port of Rotterdam, Cronifer's external industrial floor is approximately 25.000m². Cronifer has unloading bays for trucks, containers, trains and has an unloading quay for ships. These facilities are used for transporting and handling stainless steel scrap. Due to regulation, the surface needed to be liquid tight.

What were Cronifer's needs and requirements?

Cronifer needed a liquid tight surface that would be able to resist the heavy loads and wearing from heavy equipment. The floor was worn out and needed replacement. To minimize business-outrage, the company needed a solution that took minimum time to apply, in addition, the new surface had to minimize the maintenance frequency. In order to have minimum influence on their business Cronifer's wanted to have a short application time. "They didn't want to miss the use of a single square meter of their floor for any longer than necessary" says Jan Elfring, Head of the Testing & Advice department of KWS/Van Kessel, the executing contractor. An additional requirement was that, according to legal environment regulations, the surfaces needed to be liquid tight.

Original construction composition:

The original outside storage/handling area at Cronifer was made partly of a reinforced concrete foundation with combideck and partly with Stelcon plates. Concrete pavers were applied on driving lanes.

Problem definitions at the industrial area from Cronifer:

The existing floor deformed relatively quickly from the use of heavy machinery (Cranes up to 120 tons). The new product needed to have a better resistance to loads. The floor wears quickly due to the heavy scraping. "At times picking up the metal with the scrap grabbers resulted in some pieces of concrete plates and foundation coming off from the floor and being loaded in the trucks and coasters" says Ard van Driel, project leader of the executing contractor KWS/Van Kessel. This all resulted in frequent maintenance and relatively high costs.



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Assessments by Cronifer:

A new, stronger and liquid tight construction was necessary. Besides the requirements resulting from the problem definition, other important considerations included:

- The application of the new construction had to be as fast as possible, so that the area was quickly useable again.
- Various cost considerations were made: including construction and maintenance expense.
- A liquid tight certificate was required.

Cronifer considered two possible solutions for their floor:

- Concrete foundation with a combideck layer;
- C-Fix/ Carbon Asphalt Concrete

"Taking into account the sort of handling Cronifer does on these surfaces, I think that the applicable possibilities are limited to C-Fix/ carbon asphalt concrete. Especially if you are looking for a surface with minimum application time and sufficient stability for these sort of business," Elfring explains.

Asphalt and also modified asphalt is sensitive to transformation and concrete is too sensitive to damage at joints.

The solution for the industrial area at Cronifer?

The best solution for these kinds of businesses is C-Fix, the highly stable carbon concrete. The high quality of carbon concrete floor offers sufficient stability. "Considering the load on these locations you do not have many alternatives that you can use" says Elfring.

The advantages for Cronifer:

- Less damage through the highly stable qualities of carbon concrete: "The grabbers don't damage the surfaces anymore" says Ard van Driel.
- The fact that C-Fix is very quickly usable after application (after cooling C-Fix is ready to use) gave a time advantage: back in business overnight. "In this business, time is money", says Elfring.
- Lower investment costs: the price advantages as compared to the previous solutions, the price is lower then concrete and a combideck layer. John Slotboom, manager/owner Cronifer: "Concrete costs a fortune."
- Slotboom: "I am satisfied that even with extreme weather conditions the carbon concrete stays highly stable. It is a world of difference, compared to the previous asphalt-mixtures. Gebr. Van Kessel did a very good job".
- No more 'polluted' metal loads resulting from the 'scraping' of concrete pieces, which saves time and money.
- Lower maintenance costs, because the floor has better impact resistance and wear resistance, resulting in less frequent damage. If the surface needs to be repaired, it can be done for a minimal cost compared to concrete or other products. Jan Elfring: "We used to need to wait for the asphalt and the concrete foundation to cool down, which took at least three times more than it takes C-Fix / carbon concrete to cool down."
- 'PBV Cur 44' liquid tight certificate provided by ABV Haukes inspection services. "A part of the liquid tight surface is done without joints, which has a positive effect on the liquid tight qualities needed during the handling", says Engineer Marc Bergijk of ABV Haukes inspection services B.V., an advising company in the soil protection services.

Mix and construction design:

Mixture type: C-Fix SMA 0-16 top layer, ca. 6 cm thick. High Torsion variant, applied on a 6 cm asphalt layer. The areas where liquid tightness was required, a SAMI layer was applied between the two layers. The asphalt was applied on the old reinforced concrete foundation or on another 6 cm asphalt layer where there was no such foundation.



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Information about the costumer, Cronifer:

Cronifer in Moerdijk is one of the largest companies in the Netherlands. It is in the recycling industry and they recycle stainless steel and other related Ferro metals. For the handling of these materials they use heavy shovels, trucks and mobile cranes working with special metal scissors. Cronifer is a member of the International Cronimet group.

Information about the contractor, Gebr. Van Kessel:

Gebr. Van Kessel B.V. is a nationwide contractor in the area of civil and hydraulic engineering, industrial building, non-residential building and road building. Since November 2001 Gebr. Van Kessel is part of Royal Volker Wessels Stevin N.V. Gebr. Van Kessel has regional offices in Dordrecht, Tilburg and Geldermalsen, asphalt plants in Hoogblokland and Staphorst. In their laboratory in Hoogblokland they develop and test new materials as C-Fix/carbon asphalt concrete. This is also the location where they developed the High Torsion variant. Gebr. Van Kessel has successfully made many projects with C-Fix.

Other projects of KWS/Van Kessel with C-Fix/carbon concrete:

- Stuartweg in Vianen, industrial road of ca. 1 km.
- Crossroads N214/N216, Province South Holland.
- Milieustraat Ossendrecht (municipal waste area).
- Kemira, transshipment and docking station for chemicals.
- Flowers Auction Aalsmeer, indoor floor.
- Aluchemie.
- Container terminal 'Westbroek'.
- Crossroads Haarlem (by IKEA).
- Sita Amsterdam, waste recycling, inside and outside floors.
- Material depot of the Ministry of Waterways and Public Works in Houten.
- Container terminal 'Unipoort' in Rotterdam.
- National distribution centre of 'HEMA' in Utrecht.
- "Kop van Zuid", Wilhelminahoofd Rotterdam: an aesthetical, polished C-Fix outdoor floor with corrosion free blocks in the C-Fix layer in the shape of steel letters with the name.

For more information, see www.kws.nl (under the chapter 'carbon asphalt concrete').

This case study could not have been made without:

- John Slotboom of Cronifer Moerdijk.
- Jan Elfring of KWS/Gebr. Van Kessel.
- Ard van Driel of KWS/Gebr. Van Kessel.
- Marc Bergijk of ABV Haukes inspection service.