

Utgrunden Offshore Wind Farm

PPG's coating solution is still effective and intact after two decades in service

Case study



The Customer

Vattenfall, Sweden

The Location

Utgrunden Offshore Wind Farm, Baltic Sea

The Challenge

Seawater immersion, strong winds, breaking waves, ice formation

The Solution

PPG SIGMASHIELD™ 420
PPG SIGMASHIELD™ 460
PPG SIGMAZINC™ 102
PPG SIGMADUR™ 520

The Benefits

- Easy to apply and fast drying
 - Icebreaker technology (PPG SIGMASHIELD 420, 460)
 - Resistant to harsh marine weather
 - Topcoat with good color and gloss retention
-

The Result

- After over 16 years, our coating system is still effective and overall intact
 - Lower maintenance costs due to long term performance
-

The Customer

Utgrunden was one of Sweden's first offshore wind farms. It was developed in 2000 by Dong Energy and acquired by its current operator, Vattenfall, which is owned by the Swedish government, in 2006. As one of Europe's largest generators of renewable energy, Vattenfall is committed to being climate neutral by 2050.

The wind farm is located between the Swedish southeast coast and the island of Öland in the Baltic Sea, a semi-enclosed sea surrounded by Northern Europe. Utgrunden consists of seven wind turbines that have a capacity of 1,425 kW each.

The Challenge

Similar to the Black Sea, the Baltic is one of the most brackish bodies of water in the world, receiving both ocean and river water. Its salinity (or salt content) is much lower than that of ocean water as a result of abundant freshwater runoff from the surrounding land.

The protective coatings applied to the foundations, platforms and wind towers are challenged to an even higher extent due to the "Osmosis Effect" that can occur in these conditions. Low salinity also leads to heavy ice formation during winter, thereby exposing the structures to greater risks of abrasion and impact damage. Marine fouling, strong winds, breaking waves and aggressive and sudden storms present further challenges.



The Solution

PPG supplied protective coating systems for each area of the structure, which were applied during modular construction by Skagen Sandblæseri at Ørskov Shipyard in Denmark.

Submerged monopile foundations were coated with PPG SIGMASHIELD 460 reinforced epoxy coating. Splash zones were also coated with this product, along with PPG SIGMASHIELD 420 epoxy coating. Finally, all seven wind towers were primed with PPG SIGMAZINC 102 zinc epoxy primer, coated with PPG SIGMASHIELD 420 and finished with PPG SIGMADUR 520 semi-gloss conventional polyurethane topcoat.

The Benefits

Our coatings were selected because of their proven abrasion, corrosion, seawater and impact resistance in challenging offshore environments. Additionally, all the PPG products specified are easy to apply and fast drying.

PPG SIGMADUR 520 maintains the aesthetic appearance of the wind towers as it retains its color and gloss. It also delays the chalking and yellowing that will occur due to weathering and exposure to UV-light.

Underwater, PPG SIGMASHIELD 420 provides a smooth protective barrier, complicating the attachment of marine fouling. When used in combination with PPG SIGMASHIELD 460, this product forms an effective icebreaker system that protects transition pieces, monopiles and platforms during winter.

This field example supports PPG's position that it is all about good working process, choice of suitable products to achieve the expected performance.

The Results

After more than 16 years in service, a recent on-site inspection showed that the wind towers were still in excellent condition with no coating breakdown and only some visual chalking.

The seven foundations coated and erected within the same time period were also found in overall good condition. Only minor fouling had occurred and there was little visible damage to the coating.



Visit ppgpmc.com or contact:

Asia Pacific ☎ +86-21-6025-2688 ✉ ppgpmc.ap@ppg.com | Europe, Middle East and Africa ☎ +32-3-3606-311 ✉ customers@ppg.com
Latin America ☎ +57-1-8764242 ext. 201 ✉ ppgpmcandean-ca@ppg.com | North America (US & Canada) ☎ +1-888-9PPGPMC ✉ PMCMarketing@ppg.com

