Background

The port of Hanstholm was built in 1961-68 and expanded in 1984-87. The outer breakwaters currently consist of circular concrete caissons. The water depth at the entrance and the outer basin increases from 9.0m to approx. 11m and the entrance width increases from 140m to 170m.

The Port of Hanstholm is planning a major expansion of the port in order to achieve: a larger water depth in the navigation channel; new quays with larger water depth; more hinterland; better navigation conditions; more calm wave climate in the existing port.

Port Expansion project includes the design and construction of a Western and Eastern breakwater. The Western breakwater is designed by COWI as solution with a Cubipod single-layer armour, and its roundhead includes a vertical caisson.

Design conditions for western breakwater

- Breakwater length: 396 m
- Max. water depth: 11.5 m
- Design wave height: 7.5 m
- Peak wave period: 16.5 s
- Slope H/V: 1.75/1
- CUBIPOD high density (2.7 t/m³) single-layer in trunk (15 t) and round head (30 t)
- Breakwater crest: +8.2 to +9.2 m
- 2D & 3D stability and overtopping tests by Aalborg University
- 2D stability tests by Braunschweig Technical University

Construction aspects

- 2200 CUBIPOD 15 t (5.56 m³)
- 200 CUBIPOD 30 t (11.11 m³)
- Total CUBIPOD concrete volume: 14,454 m³
- 12 molds for CUBIPOD 15 t
- 1 molds for CUBIPOD 30 t