

# WAVE FLUME AND WAVE BASIN DESIGN OF COASTAL STRUCTURES IN FLANDERS

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The hydraulic design of coastal structures is a complex task. In the past decades physical scale models often were the only possibility to verify the design. Nowadays computer models are very powerful but some physical processes still cannot be calculated accurately. Therefore physical scale models are still intensively used as design tools in almost all major coastal engineering projects.

Since the 80's of the previous century Flanders Hydraulics Research has invested in 3 wave facilities: two wave flumes for two-dimensional scale models and one wave basin for three-dimensional scale models. The dimensions (L x W x D) of the small wave flume are 41m x 0.7m x 0.86m, the large wave flume 70m x 4m x 1.4m and the wave basin 17.5m x 12.2m x 0.45m.

Flanders Hydraulics Research has performed a lot of studies in the past decades. This abstract and the accompanying poster give a limited overview of some scale models dealing with research on coastal structures.

- Stability of the Zeebrugge breakwaters.
- Stability of 'Binnenrede' in port of Zeebrugge.
- Wave forces on wind turbines on top of the Zeebrugge breakwater.
- Wave run-up at Zeebrugge breakwater (Opticrest - optimisation of crest level design).
- Hydraulic stability of the beach of Oostende.
- Current velocities at the entrance of the port of Oostende.
- Hydraulic stability of a new breakwater in Oostende.
- Wave overtopping at a new seadike in Oostende.
- Wave forces on a piled pedestrian walkway on top of the new breakwater in Oostende.
- Wave penetration in the port of Oostende.
- Wave overtopping at Zeeheldenplein Oostende.
- Hydraulic stability (waves + current) of beach profiles in Knokke-Zoute.
- Comparative research on the hydraulic stability of different armour units.
- Wave forces on underwater screens.
- Wave overtopping at Ostia yacht harbour (Clash - crest level assessment of coastal structures).
- Wave overtopping at sea dikes with broad crest, crest with roughness, crest with broad sand berm in front.