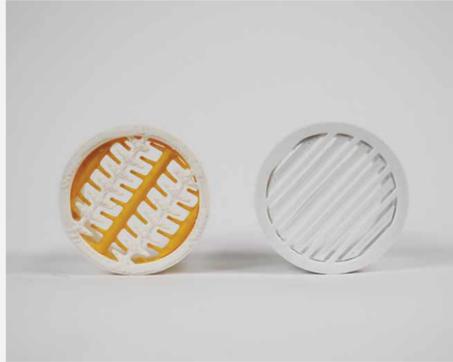


RAFT Duck beak nurdle filter in The Scheldt

INTRODUCTION

Based on the high concentrations of polyethylene and polypropylene pellets of 2–5 mm found along the Scheldt riverbanks, with peaks up to 3,352 pellets per m² in the Antwerp port area, a biobased filter inspired by the lamellae structure of a duck bill should be designed to efficiently capture these microplastics.

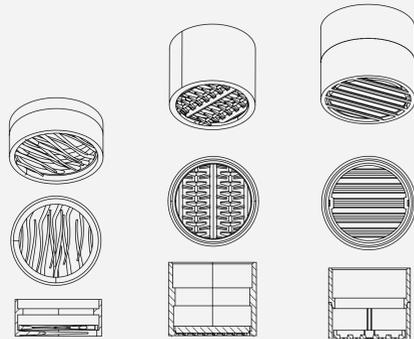
1. SHORE



PROTOTYPE
PLA iterations



TEST SETUP
Suction simulated by a syringe

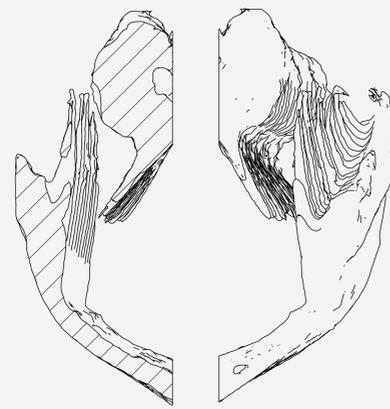


ADOPT A DUCK

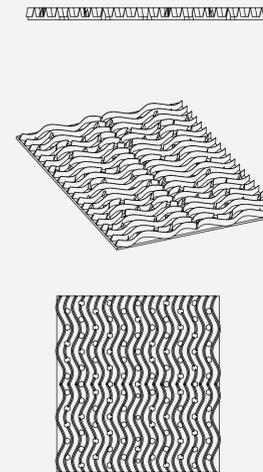
Floating ducks are placed along the shores of the Scheldt. Residents can adopt a duck and track how many plastic pellets it collects, showing the environmental impact of their duck. The collected pellets are later recovered and can be sold back to the original companies or reused by users. Using suction combined with moving lamellae inspired by a duck's bill, the system captures pellets and stores them in an internal container.



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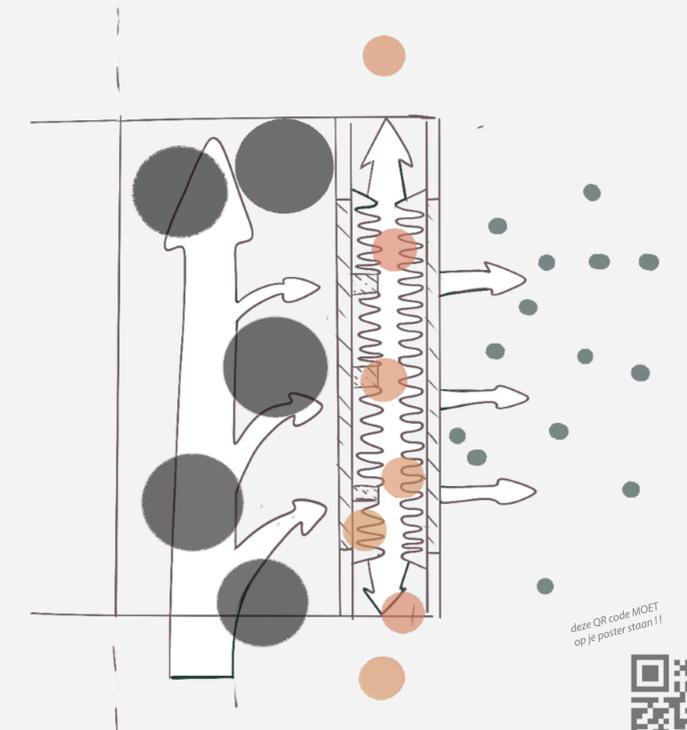


2. DEEP WATERS



DREDGING ADD ON

This concept has a different scope and is not sensitive to environmental context, but it is applicable on an industrial scale. The filter functions as an add-on to a dredging vessel and is designed to extract pellets from dredged sediment. Due to centrifugal force, all particles are forced through a sieve system. Particles that are too large remain in the inner tube, while particles that are too small pass through both sieves. The targeted pellets are retained between the sieves and are extracted from the system using an Archimedes screw. The advantage of this approach is that it could achieve maximum impact at minimal cost.



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