

DIN EN 12255-7:2002

„Carrier media in submerged fixed-film bioreactors and biological filters must be resistant to abrasion.“

Biofilm Carriers –

The Job Description

Biofilm carriers for biological treatment must provide essential performance characteristics including high specific surface area, optimum fluidization behaviour and long-term physical stability against abrasion. Physical stability is explicitly specified in DIN EN 12255-7:2002 as well as in Germany's DWA M221 regulations:

"The support media must be dimensionally stable and abrasion resistant."

M221 Regulations / DWA

In the course of developing Poret®aqua, EMW utilized long-term stress testing to investigate the physical stability of a number of carrier candidates. The goal of this development programme was to define a material providing excellent abrasion resistance along with the other essential properties described above.

Stress Test – Set-Up and Procedure

The various materials evaluated were tested as cubic carrier elements identical in shape, size and visual appearance to today's Poret®aqua, differing only in their composition.

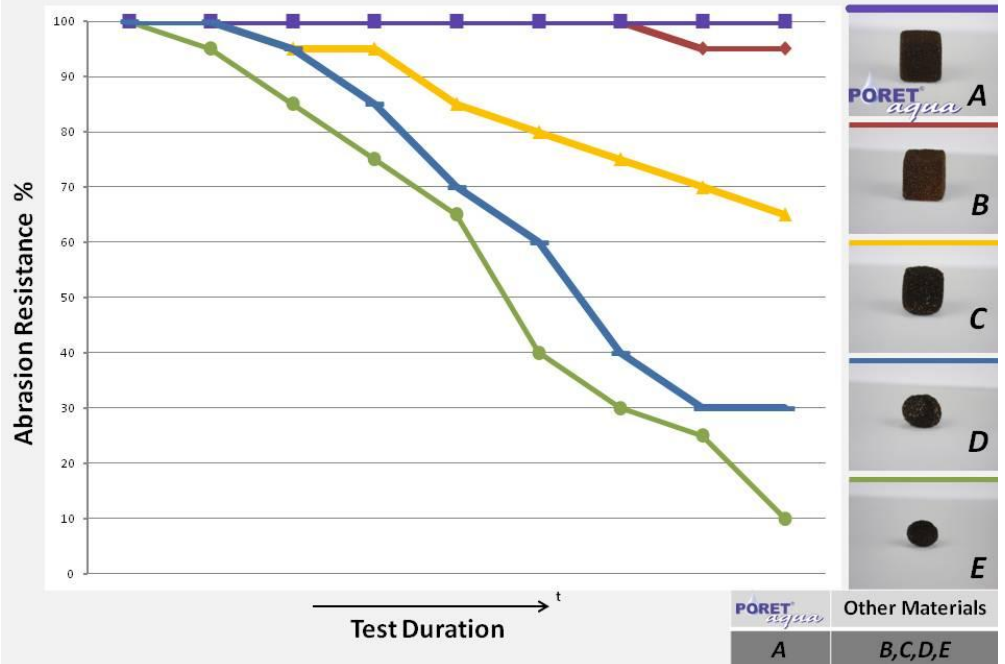
The EMW stress test simulated water treatment process conditions in plastic bioreactors. The carrier elements in the reactors were continuously fluidized, creating ongoing turbulence and frictional contact.

After testing, the materials differed significantly in appearance, some showing severe erosion and others essentially unchanged in shape as compared to before the test.

Further Evaluation

The EMW stress test provided screening evaluation of the carrier materials considered for development. The variations in damage observed correlated to differences in composition of the materials tested.

(cf. the schematic plots above)



Schematic plots of abrasion resistance vs. time in stress test. Substantial differences are seen in abrasion resistance of the materials evaluated.

In the next step of the programme, the best-performing carrier material was tested under field conditions in diverse municipal and industrial treatment applications. Varying factors here included the bioreactor's material of construction (plastic or concrete) and the contaminant content of the wastewater treated.

Field Results

Confirming the stress test findings, the field testing results documented Poret®aqua's outstanding abrasion resistance in full conformance with DIN EN 12255-7. Users also benefited from Poret®aqua's optimum fluidization behaviour and high specific surface area of 1000 m²/m³.

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Reference municipal wastewater treatment



Poret®aqua following 2 years' field service in concrete MBBR.

PORET®
aqua



The carrier material
for biological
wastewater treatment

