

## CLAIMS

1. Method for biological purification of waste water in a continuous process comprising
  - 5 a) receiving a pretreated waste water in-let stream (1) in an anaerobic zone (A) of a reactor wherein micro-organism culture exist on free flowing biofilm carriers,
  - b) letting the waste water stream with the biofilm carriers into an aerobic zone (C) aerating the waste water stream and carriers received from the  
10 anaerobic zone,
  - c) at the end of the aerobic zone (C) moving the biofilm carriers mechanically to the anaerobic zone (A) without transfer of water (5), and
  - d) discharge the water through an outlet (2) to a sludge separation process
- 15 2. Method according to claim 1 comprising an anoxic zone (B) between the anaerobic and aerobic zone.
3. Method according to any one of claims 1 to 2 comprising mechanical  
20 transfer (3, 4) of the biofilm carriers between zones/chambers.
4. Method according to any one of claims 2 to 3 wherein a part of the out-let stream (6) is re-introduced into the anoxic zone.
5. Method according to any one of claims 1 to 4 wherein the filling ratio of  
25 carrier media is between 1% and 100%, preferably between 30 % to 75 %, of the wet volume of the reactor.
6. Method according to any one of the preceding claims wherein the out-let  
30 stream (2) proceed to a separation step for collection of sludge for further treatment and discharge of purified water to recipient.
7. Reactor for continuous biological purification of waste water,  
35 comprising an in-let (1) to an anaerobic zone (A), followed by an aerobic zone (C), one or more mechanical device (5) for transfer of biofilm carriers from the aerobic zone (A) to the anaerobic zone (C), and an out-let (2) characterized in that the one or more mechanical transport devices (5) for transfer of biofilm carriers allow water to drain off.

8. Reactor according to claim 7, wherein the reactor further comprises an anoxic zone (B) between the anaerobic (A) and the aerobic zone (C).
- 5 9. Reactor according to claims 7 or 8, wherein the one or more mechanical transport devices (5) are elevators, transport screws, belt conveyers or the like.