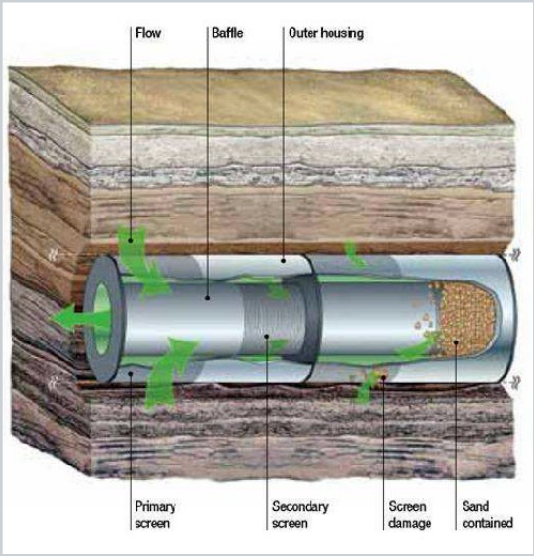
MazeFlo™ with FloReg™ Self-Mitigating Screen Technology

The MazeFlo self-mitigating screen technology is patented by ExxonMobil and jointly developed and licensed to Weatherford. The screen increases reliability in sand-control completions by incorporating a maze design to constrain local sand ingress caused by screen damage without interrupting well production.

Weatherford FloReg inflow control device (ICD) is designed to help evenly distribute inflow throughout a horizontal wellbore. This device reduces the undesired tendency of early water or gas coning, and enables the reservoir to drain more efficiently while maximizing production and recovery. The FloReg ICD enables uniform production and flow contribution along a sand-face completion in horizontal wells. The system can be retrofitted with a range of Weatherford screens.



The screen contains at least one compartment along a selectively perforated base pipe. As shown in the illustration, each compartment contains a primary screen, FloReg ICD, flow baffles, outer housing, and a secondary screen. Produced fluids flow from the wellbore into the primary screen—between the primary screen and the nonperforated base pipe section—through the FloReg ICD and then are redistributed by the flow baffles. The fluid, which then flows more uniformly, travels through the housing, into the secondary screen, and then through the perforated base pipe, where it commingles with produced fluid from other compartments.

If the primary screen erodes, the sand flows into the housing compartment, accumulates on the secondary screen, and subsequently increases the resistance to flow in the problematic compartment. The produced fluid is then diverted to the adjacent undamaged screen compartments. This screen self-chokes production only at sand breakthrough locations, and the self-choking occurs automatically without the need for surveillance or a control system

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Applications

- Openhole standalone completions
- Horizontal and extended-reach wells
- Deepwater and remote locations

Features, Advantages, and Benefits

- Patented self-mitigating sand-control screen compartments constrain local sand ingress; the screens initiate self-mitigation with no monitoring and no intervention required.
- Patented Ultra-Grip manufacturing process greatly improves tensile, torque, and collapse strength.
- The self-mitigating function of MazeFlo chokes only the sand-production section of the well trajectory, which leaves the remaining well segments to produce well fluids without sand and improves operational efficiency.
- Heavy-duty surface wire provides greater erosion resistance, which increases mechanical strength and extends life in the most demanding environments.
- Precision-formed wire and high-precision slot tolerances provide optimal sand control for maximizing production.
- Pressure drop in each flow port is viscosity independent but density dependent, which inhibits water breakthrough.
- The number of open flow ports can be adjusted to the prescribed setting based on the latest data, which enables conducting the procedure at the surface at any location before running in the wellbore.
- FloReg ports are tungsten carbide, which mitigates flow-induced erosion.
- High rib wire for primary and secondary screens creates larger annular space between screen and nonperforated base pipe, which reduces friction loss.

Specifications

Base Pipe			Screen				
Size (in.)	Weight (lb/ft, *kg/m*)	ID (in., *mm*)	OD (in., *mm*)	Weight (lb/ft, *kg/m*)	Tensile Strength[1] (lb, *kg*)	Burst Resistance (psi, *MPa*)	Collapse Resistance (psi, *MPa*)
5-1/2	20.00 *29.76*	4.653 *118.2*	8.250 *209.6*	29.07 *43.26*	368,700 *167 591*	3,101 *21.4*	4,600 *31.7*

1. Screen tensile strength is based on standard perforated base pipe.
2. Maximum bend angle for screen may exceed allowable bend angle for some threads. See manufacturer's specifications.

MazeFlo™