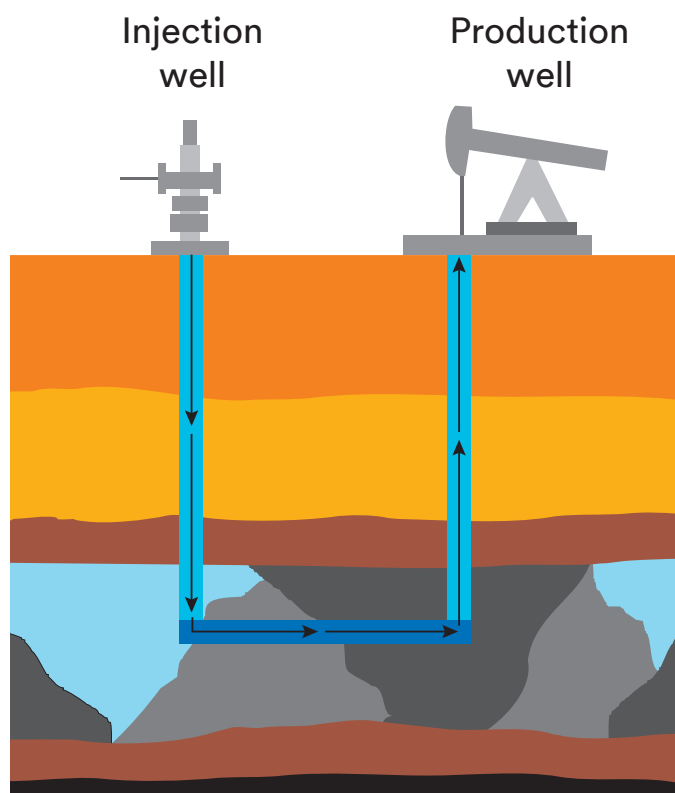


The filtration that keeps it flowing.

Using waterflooding, or water injection, for enhanced onshore oil recovery can provide up to 40% additional oil production. The quality of the injected water is critical in the effectiveness of waterflooding operations in oil recovery, and requires a filtration system capable of removing particles that can plug well formations.

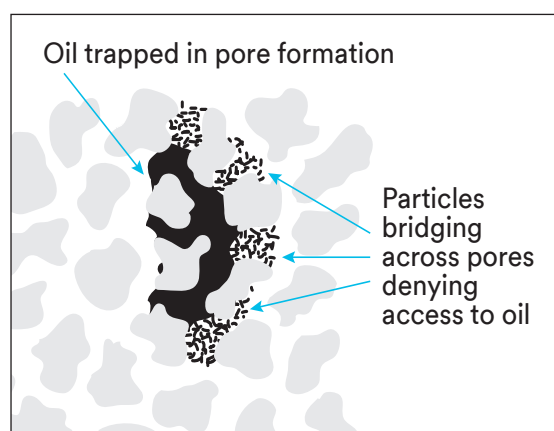
Injected water must be treated so that the oil and particulate content is reduced to sufficient levels to prevent potential clogging of the reservoir well pores and subsequent loss of oil production.

Injection well example



Waterflooding can increase reservoir pressure and “sweep” oil to the production well.

Formation pore plugging due to particles

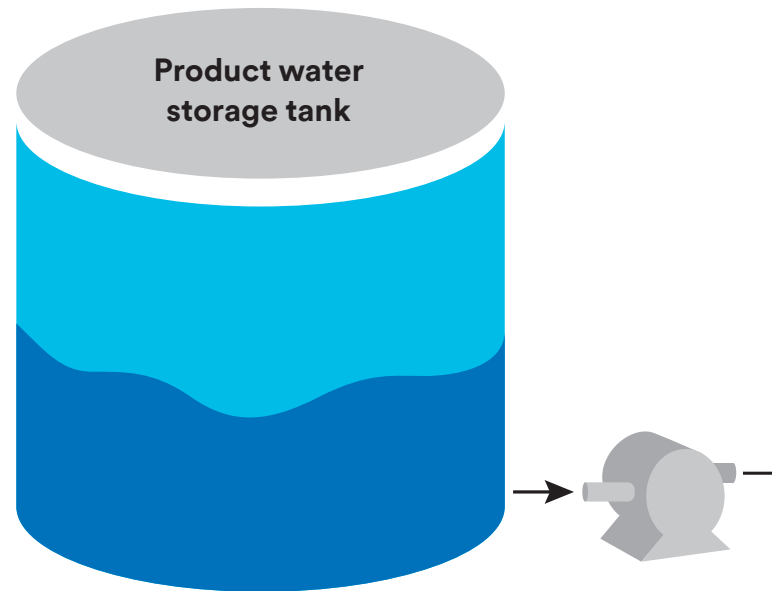


Let increased production take centre stage.

1

First stage filtration

Nominally rated filter products are frequently used as an economical method for removing larger particles in the first stage. Cartridge or bag filter products, typically rated between 25 and 100 microns (nominal) are used, depending on the existing filter vessels or operator preferences.



3M™ DF Series Filters (for Bag Housings)

These filter elements feature longer service life and holding capacity than conventional nominally rated bag filters. DF Series elements can be used in existing bag housings with specially designed baskets.

- Greater than 60% more filter surface area providing up to 3-5 times more service life and 2-3 times more dirt holding capacity compared to most commonly used standard bag filters
- Innovative filter element and basket geometry reduces the potential for element rupture and downstream fluid contamination

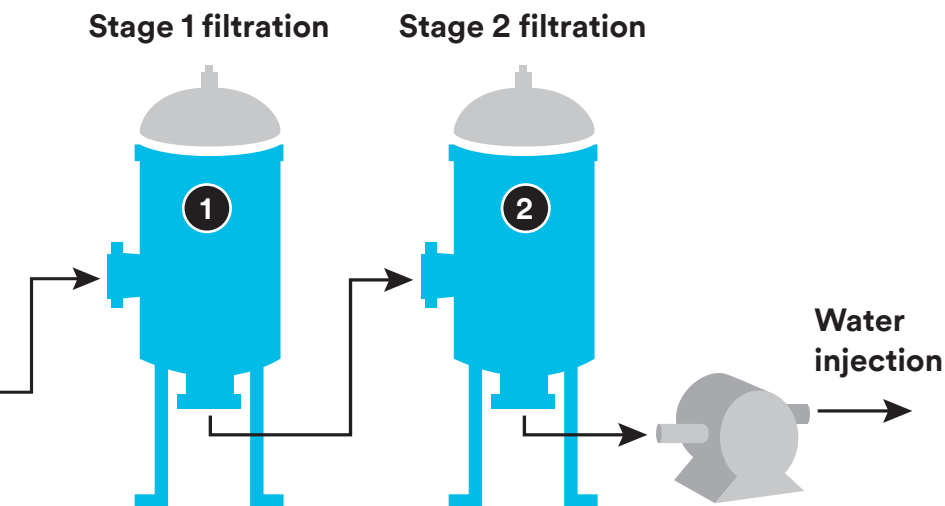
3M™ Micro-Klean™ RT Series Filter Cartridges (for 2.5" Outer Diameter (OD) Filter Cartridge Housings)

Polypropylene depth filter cartridges featuring rigid extrusion bonded technology.

- Enhanced contaminant holding capacity for longer life compared to 2.5" OD depth cartridges
- Consistent particle removal efficiencies throughout filter life
- Low initial differential pressure

A two stage process often provides the most cost-effective filtration solution.

Two stage water injection filtration example



2

Second stage filtration

In this stage, absolute rated filter products rated in the 1-25 micron (absolute with 99.9%) range are typically used for removal of fine particles.

3M™ High Flow Filters (for New Installations)

These large 6.5" OD cartridges in 40" and 60" lengths feature high-efficiency polypropylene microfibre media.

- Compound radial pleat design yields a large amount of filter media surface area per cartridge
- High flow rates up to 113m³/hr (per 60" cartridge) reduces elements needed and the size of housing required—lowering capital investment
- Twist-to-Lock feature provides a positive indication of proper sealing

3M™ 500 Series Bag Filters (for Bag Housings)

Multi-layer polypropylene bags for use in Size 2 bag housings.

- High efficiency blown microfibre media provides higher particulate holding capacity than standard bags
- High oil-absorption capacity
- Transport/bypass layer design optimises flow and filter life

3M™ Betafine™ XL Series Filters (for 2.5" OD Filter Cartridge Housings)

These cartridges are constructed with high efficiency polypropylene media using 3M™ Advanced Pleat Technology (APT).

- APT provides up to 4.4 times greater service life than equivalent competitive products
- Absolute rated media helps remove fine particles (as small as 0.2 microns)
- 3M Betafine cartridges are available in various micron ratings

Filtration solutions for waterflooding operations

	Product name				
	3M™ DF Series	3M™ Micro-Klean™ RT Series	3M™ 500 Series	3M™ Betafine™ XL Series	3M™ High Flow Series
Filtration stage	First stage	First stage	Second stage	Second stage	Second stage
Filter housing	Bag (requires special basket)	2.5" OD cartridge	Bag	2.5" OD cartridge	High Flow Filter Housing
Materials of construction	Polypropylene or Polyester	Polypropylene	Polypropylene	Polypropylene	Polypropylene
Micron ratings	1 - 200 (nominal)	1 - 70 (nominal)	2.5 - 48 (absolute 99%)	0.2 - 70 (absolute >99.9%)	1 - 70 (absolute >99.9%)
Dimensions	Size #1: 7"D x 16" L Size #2: 7"D x 30" L	Diameter: 2.5" Length: 10", 20", 30", 40"	Size #2: 7" D x 30" L	Diameter: 2.5" Length: 10", 20", 30", 40"	Diameter: 6.5" Length: 10", 40", 60"

For more information about the 3M™ High Flow Filter System, please contact your 3M representative.

Important notice

Product use: Many factors beyond 3M's control and uniquely within user's control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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