

# WIX<sup>®</sup>

FILTERS

**Oil filters**  
for truck, buses and heavy duty vehicles



*WIXtreme protection*

## Oil Filter DOs and DON'Ts

**Always** clean the filter mounting base after removing an oil filter. Dirt trapped between the flange and gasket may deform and tear the new gasket, causing a leak.

**Always** make sure the old gasket doesn't stick to the mounting base when the old filter is removed.

**Always** remove and replace any filter that is dented during installation. The use of a filter wrench is a common cause of filter denting.

**Always** lubricate oil filter gaskets with clean motor oil prior to installation.

**Always** make sure the filter part number is correct for the application and the filter and box numbers match.

**Always** inspect the filter before and after installation. Just because the filter will thread onto the nipple doesn't necessarily make it the correct filter.

**Never** use grease to lubricate an oil filter gasket. Grease is not compressible and may cause an oil leak.

**Never** over-tighten a filter. Over-tightening places excessive load forces on both the oil filter threads and gasket and could result in leaks. Many large filters must be tightened with a wrench. Always follow the filter manufacturer's guidelines for tightening.

**Never** remove and reinstall a filter already in service. The gasket may become weak and not set properly – resulting in leaks.

## Beta Ratio Basics

Everywhere you turn in the filtration industry, people are talking about micron ratings. But since there is no industry test standard for micron ratings, which in themselves are theoretical and not absolute, WIX Filters wants to make sure that you are using the filter test method that has been accepted by virtually every filter and equipment manufacturer.

Beta Ratios are used to measure filtration efficiency with liquids. The Beta Ratings Test uses contaminants specially graded by particle size. Measured amounts of these test particles are added regularly to the fluid that is pumped continuously through the filter, hence its multi-pass test designation.

Measured samples of the fluid are taken at timed intervals upstream and downstream of the filter. The contaminant in these samples is measured for particle sizes and the quantity of each size or range of sizes.

The Beta Ratio is calculated by dividing the number of inlet particles of a given size by the number of outlet particles of a given size.

For example: If the inlet (dirty side) particles equal 200, and the outlet (clean side) particles equal 100, then

$$200/100 = 2$$

In this case, the Beta Ratio equals **2**

The Beta Ratio can be converted to a percentage efficiency using the following formula:

$$\text{Beta} - 1/\text{Beta} = \text{Percent Efficiency}$$

If we use the Beta value from our previous equation we get:

$$(2-1)/2 = 1/2 \text{ or } 50\%$$

Based on this example, the above-mentioned filter has an efficiency of 50% at the size or particle measured.

## Glossary of Terms

**Beta Ratio:** Indicated by the symbol  $\beta$ , beta ratio is a calculation of filtration efficiency based on test data from multi-pass testing. The Beta Ratio represents the number of particles of a certain size that enter the filter, divided by the number of particles of the same size that pass through the filter.

**Bypass Filter:** An extra filter commonly used with a full-flow oil filter system that filters a portion of the total oil by circulating it through an extremely fine filter to remove small particles.

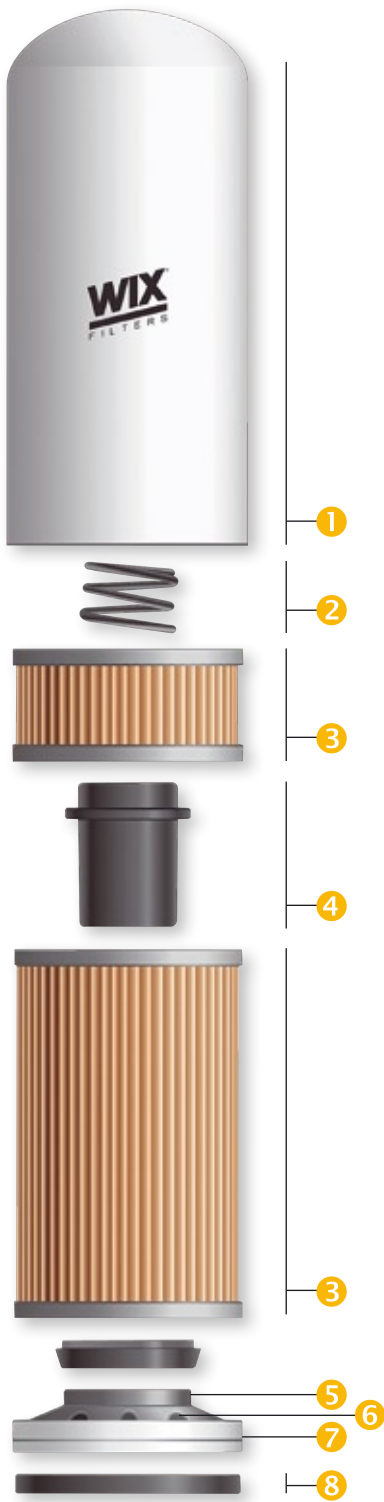
**Capacity:** Total contaminants trapped and held by filter media under specified test conditions, measured by weight.

**Media:** The material used to remove particles and other contaminants from a fluid flow stream.

**Pleated Paper:** Paper filtering media made primarily of specially treated cellulose and/or synthetic fibers.



# WIX Heavy Duty Oil Filter



**1** The Filter Shell is designed to resist cracking and withstand high static pressures of more than 300 psi. It is enamel coated to resist rust and corrosion.

The Center Tube of the oil filter acts as a spine to support the filter element components of end caps and pleated media. Test results from WIX's Benchmark Study show the inner element will withstand wide fluctuations in flow and high differential pressure to ensure system integrity.

WIX uses an embossed and perforated Spiral Center Tube to provide maximum strength while allowing fluid flow. The spiral design is stronger and promotes fluid flow better than the lock-seam center-welded tube used by many manufacturers.

**2** A Steel Tension Spring with kicked-and-tucked ends keeps the element in constant contact with the element support and base plate. These springs had the best load capacity with 63 pounds when tested in WIX's Benchmark Study. This high-load capacity means no unfiltered oil bypasses the filter element under extreme operating conditions and pressures.

"Torque-Right" installation marks take the guesswork out of filter tightening.

**3** Prescription Media<sup>®</sup> is carefully blended using the appropriate recipe for each application. Media is then bonded to the end caps with a vinyl-based plastisol adhesive that creates a strong, leak-free filter element.

**4** WIX XD Heavy Duty oil filters contain patented spin-flow technology that ensures low-flow restriction through the filter elements.

**5** The majority of WIX Heavy Duty spin-on filters use the neck-down base-plate configuration. The neck-down design places additional base-plate material around the threaded hole for improved strength.

**6** Oil Inlet Holes on the threaded base-plate are arranged to provide maximum oil flow while maintaining base-plate strength. Additionally, the relative placement of the cover plate inner diameter to the inlet oil holes is important to promoting a steady, even flow of oil into the filter.

The combined strengths of base-plate, cover-plate and outer-shell form the support housing for the filter element.

**7** The Oil Filter Gasket Retainer Cover Plate and Filter Shell are joined by a Double Rolled Seam. WIX also uses a sealer in the contact area between the rolled metal surfaces to ensure a strong, leak-free seam. This tight mechanical bond creates a sturdy filter-body assembly that is able to withstand hundreds of pounds of pressure and assures that WIX products are structurally sound for durable and reliable use.

**8** The Nitrile Rubber Lathe-Cut Gasket sits in a groove in the filter cover plate to withstand extremely high pressures without leaking. Unlike other competing filters, WIX gaskets have small dimples in the gasket groove to prevent the gasket from falling out while still allowing it to rotate slightly during filter installation.



# If you think that all the Heavy Duty oil filters on the market are the same – think again!

Through its commitment to continued research and development, WIX Filters is the stand-out choice for Heavy Duty professionals. WIX has taken all the guesswork out of choosing any Heavy Duty oil filter – whether it be for a fleet, agricultural or off-road application.



*WIXtreme protection*



Extreme temperatures, special fuels and lubes, tens of cubic metres of air being sucked into the engine to produce average speeds of 300kph... This is the world where Wix Filters, the only filters officially licensed in the NASCAR series has to work. Check out our offer for European and American passenger cars on [www.wixeuropa.com](http://www.wixeuropa.com)

## Did You Know?

Positive displacement oil pumps create pressure pulses. Spin-on oil filter cans are made of carbon steel that resists fatigue and are shaped to equalize internal pressures. Installing a filter with a dent can weaken the steel and localize internal stresses, which may result in fatigue cracking in the area near the dent. Never install a dented filter. If you find one upon inspection, replace it immediately. The cost of replacing a filter is far less than repairs associated with potential engine damage due to a ruptured filter body.

Extremely high oil pressure can result in a catastrophic oil filter leak. Where the leak occurs depends on how tightly the filter was installed. If the filter is not properly installed, its sealing gasket can be displaced and the dome geometry of the filter can will be permanently changed. If the filter is installed "on the tight side," the gasket may withstand the high oil pressure, but the rolled seam between the filter cover and can may rupture. If the filter is dented, it may burst at the weakened area where the dent has occurred.



oil filtered elements



clean oil

For the industrial and agricultural applications please visit [www.wixfilters.com](http://www.wixfilters.com)



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