

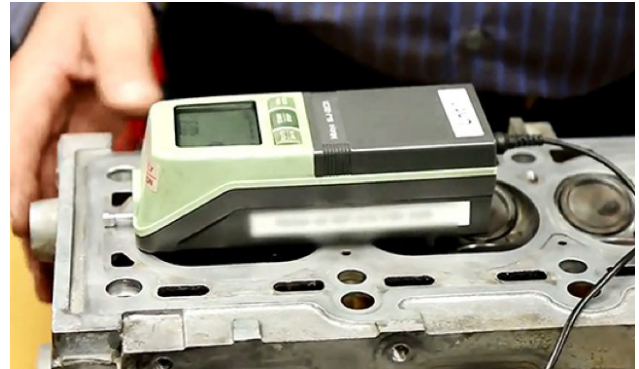
How To Prepare An Engine Surface For Gasket Installation

PREP WORK REQUIRED

As the engine's most dynamic and critical seal, the head gasket must withstand high temperatures and casting movement to create a perfect and reliable seal. It not only must contain the extreme cylinder pressures generated during the combustion process, but also has to seal high pressure oil, the oil drains back, and engine coolant. There are a number of variables that contribute to both the horizontal and vertical motion that occurs between the cylinder head and engine block (deck area).

Fel-Pro® uses a variety of the latest sealing technologies available to design head gaskets that conform and compensate for minor surface imperfections while being dense enough to maintain even loading between the cylinder head and block. However, even the best head gasket can't seal a surface that is improperly prepared. Before installing a new head gasket, surface conditions of the engine block and cylinder head must be inspected and refinished if they are out of spec.

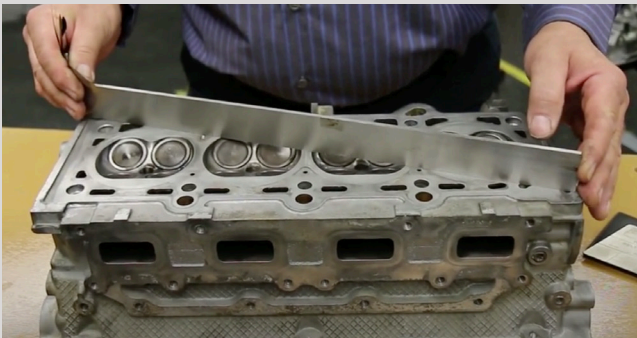
DETERMINING THE PROPER FINISH



In order to determine an appropriate surface finish, consider the metallurgy of the head and block castings as well as the material and design of the head gasket being used in the install. **Different gaskets require different surface finishes, so the surface finish must be matched to the type of gasket that is required for the application.** To determine surface finish requirements, consult the OEM repair manual.

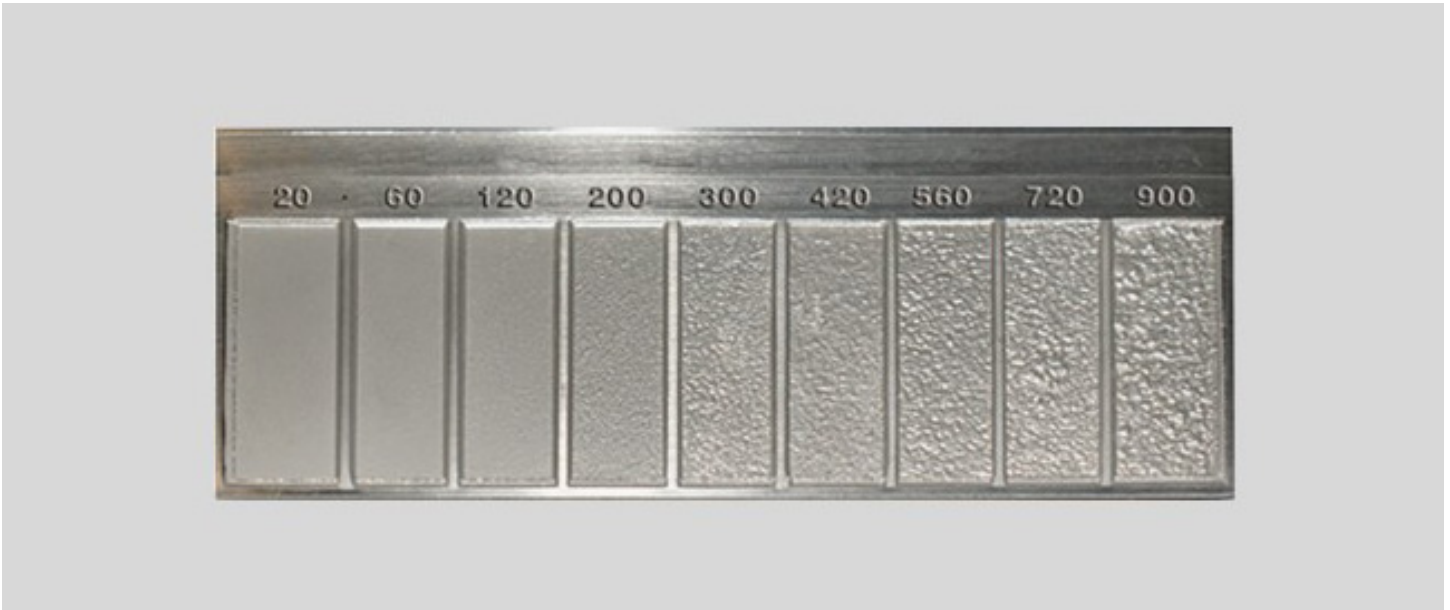
- Each type of Fel-Pro head gasket – whether it be PermaTorque® MLS, PermaTorque, solid or perforated core, single layer embossed steel, or other types are designed specifically to accommodate the surface finish requirements for each application.
- If the surface is too smooth, the gasket will have less “grip” and may leak.
- If the surface is too rough, the gasket will have a difficult time conforming to surface imperfections and may also leak.
- Surface finish can be checked using a surface finish comparator or a profilometer.
- Checking the cylinder head surface finish and flatness is an important step to take before installing a head gasket.

FIELD TEST GARAGE VIDEO



Watch our Field Test Garage video at [FelPro.com](https://www.felpro.com) or on our [YouTube](https://www.youtube.com) page to see how to check cylinder head flatness and surface finish.

MEASURING ROUGHNESS WITH SURFACE FINISH COMPARATOR



Roughness Average (Ra) is the average micro-inch measurement of peak-to-valley roughness height of a flat surface. The lower the Ra number, the smoother the surface. Fel-Pro recommends a finish of 60 to 80 Ra for cast iron cylinder heads and blocks and 50 to 60 Ra for aluminum.

Fel-Pro uses proprietary head gasket coatings and facing materials designed to fill in minor surface imperfections and allow for improved sealing on the imperfect surfaces found in the repair environment. OEM MLS gaskets work well on new, flat, clean castings, since they require a very smooth surface finish, usually 20-30 Ra or less.

Fel-Pro's PermaTorque MLS head gaskets are designed specifically for the repair environment and use a specialized coating that accommodates finishes as rough as 80 Ra.

Visit [FelPro.com](https://www.felpro.com) to learn more about how our gaskets are designed for the repair environment to help seal imperfect sealing surfaces. Find Fel-Pro products with our easy [part finder](#) and products near you with our [part store and repair shop locator](#).

The content contained in this article is for informational purposes only and should not be used in lieu of seeking professional advice from a certified technician or mechanic. We encourage you to consult with a certified technician or mechanic if you have specific questions or concerns relating to any of the topics covered herein. Under no circumstances will we be liable for any loss or damage caused by your reliance on any content.