

# Multi-Layer Steel Cylinder-Head Gaskets



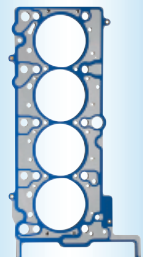
**VICTOR REINZ®**

Sealing Products



## **Cylinder-Head Gaskets: The Intricate Details.**

Technically, the cylinder-head gasket is the most demanding gasket in an engine, sealing the combustion chambers and coolant and lubricant channels. The cylinder-head gasket has a significant influence on the distribution of clamping force in the overall engine system and on cylinder distortion.



# Multi-Layer Steel (MLS) Cylinder-Head Gaskets

## Ideal Solutions.

No two engine designs are the same. Equally varied are the demands placed on the design of MLS cylinder-head gaskets. Our engineers have the experience to design plastic/elastic sealing characteristics that will follow the engine's deformations under all operating conditions, while also ensuring that the surface pressures do not fall below the levels needed for reliable sealing.

## High Performance Layer-by-Layer

Attention to product design, coupled with the use of high-quality materials, is the foundation for highly reliable Victor Reinz® cylinder-head gaskets. Different engines have different requirements. Our global team of engineers has a high degree of experience with varied engine types and configurations. Dana can provide the optimum sealing solution for your application, supported by the finest infrastructure in the sealing world.

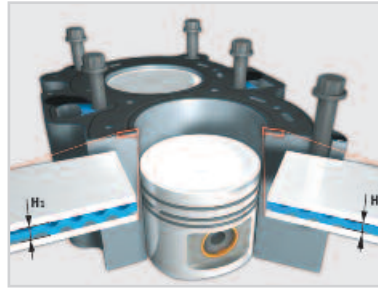
## Product Features

- Global materials and design specifications
- Adaptive fluoroelastomer (FKM) coating flows to seal rougher surface finishes
- Embossment shapes designed to improve durability
- Stopper layer can be designed with topography to optimize load balance

## Product Benefits

- Improved reliability and durability
- Reduced oil consumption
- Improved engine performance
- Reduced bore distortion

Depending on the functions that cylinder-head gaskets must perform, they are fitted with different functional elements. These elements represent the freedom of design that defines MLS head gaskets.



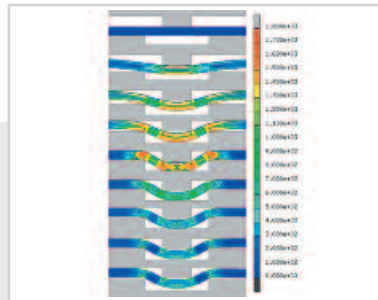
### Wave-Stopper® Technology

Topographic adaptation of Wave-Stopper technology provides selective functional control.



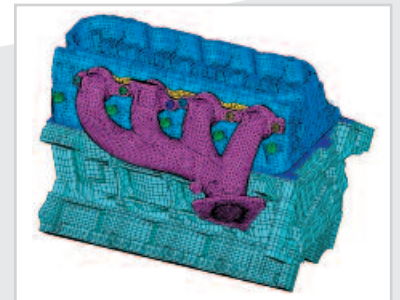
### Increased Through-Put

Minimized time and cost factors through automated production lines.



### Finite Element Analysis (FEA) for MLS

The forming process of the embossments using FEA helps to evaluate internal stress, performance, and tooling tolerances. In addition, it helps to screen the different designs in a quick and more accurate manner.



### Engine System 3-D Analysis

Structural analysis of the engine system provides a comprehensive understanding of the sealing performance of the MLS gasket, along with its influence on other components, under all operating conditions.

## These elements include:

- Selective materials
- Full surface and partial coatings
- Bead geometry of the active layers
- Design and number of layers

Dana's versatile Wave-Stopper® gasket provides the design team with the maximum flexibility in distributing the sealing forces across the surface of the gasket. Concentric waves are embossed in the active functional layer of the spring steel sheet around the combustion chamber. The greatest attributes of the Wave-Stopper are the wide range of available standover heights and the ability to include a height profile (topography) within a given gasket.

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