

## Moldflon™ high performance seals for thermal modules

-regulated safely-

<b>Challenge</b>	Sealing of a control valve for the main cooling systems in combustion and hybrid vehicles. Provide ideal dynamic and static functionality, with minimal friction at temperature range of -40°C to +140°C and a 300,000 km lifespan.
<b>Solution</b>	Due to the design complexity and the requirement for low friction combined with a need for superior sealing performance, only an injection-molded Moldflon™ jacket with a supporting spring could have been considered.
<b>Result/Conclusion</b>	The „Plug-and-Place“-sealing solution combines static and dynamic sealing functionality in one piece. By offering an one piece solution the customer was not only able to simplify the assembly concept but also reduce the risk of assembly errors or potential leakage.

The component geometry that had to be sealed and the requirements for the control valve in the main cooling system lead to different challenges:

Resistance to coolant; temperature resistance -40°C to +140°C; minimum leakage; 300,000 km lifespan; tolerance compensation of up to 0.7 mm; statically sealed without an additional elastomer seal.

Based on the geometry selected by the customer, a seal jacket made of Moldflon™ MF10010 was designed. Injection molding of Moldflon™ MF10010 enables increased design flexibility combined with cost savings due to less material waste and scrap.

In order to guarantee sealing functionality over the applications lifespan, the seal required additional force from a spring which reliably seals the static and dynamic sides of the seal with relatively constant force against the sealing surfaces.

The original idea for the described solution was based on ElringKlinger's spring-energized seals. In order to be able to transfer this concept to the valve application, the impact of the spring force had to be adjusted accordingly to the specific conditions of the installation space.

A specific spring assembly process has been developed in order to guarantee full sealing functionality. This ensured the customer would have full sealing functionality with constant valve adjustment forces, even for critical tolerances.

The new sealing concept reduced the number of components and therefore lowered the risks of assembly errors and leakages. These improvements and the economic/environmental advantage of the "plug and place"-sealing solution ensured an entirely satisfied customer.

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