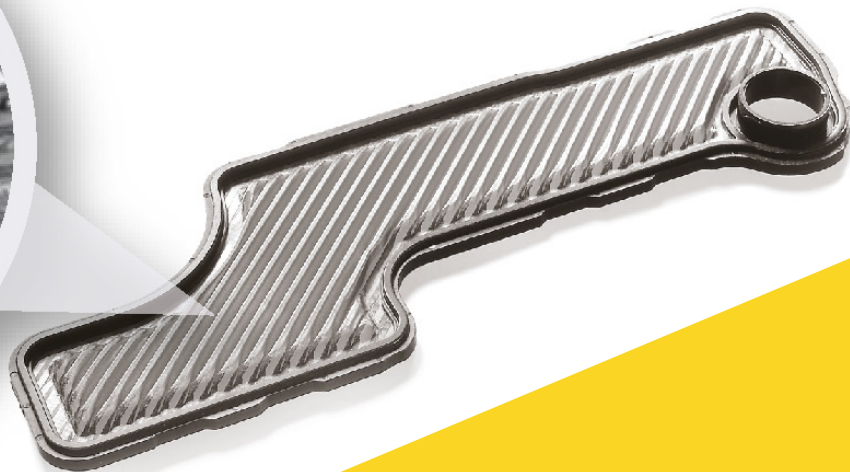




THE FUTURE OF HIGH-PERFORMANCE TRANSMISSION FILTERS

wstyler

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A Haver & Boecker Company



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EXECUTIVE SUMMARY

Original equipment manufacturers face increasing pressure to produce the best products in a shifting, ultra-competitive automotive sector. Sourcing proven, superior components for product offerings is the most proactive method of quality assurance.

Reliable, high-performance powertrains require reliable, high-performance parts. Finding the perfect transmission filter is a critical step in the engineering process and ensuring a powertrain meets stringent quality standards. Serving as the frontline defense for the transmission, the filter media prevents contaminants from reaching close-tolerance components; however, elements of the filter are often sacrificed to achieve other design objectives. The cost of these time-intensive concessions can result in shorter life expectancy, diminished performance, and strained relationships with manufacturers.

Performance does not need to be compromised in the face of challenges. W.S. Tyler, a leader in woven wire cloth and mesh materials, is equipped with the experience and expertise to be your full-service partner in the specialized development and production of transmission filters.



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STATE OF THE INDUSTRY

Tier one suppliers have become a distinct, interconnected part of the global automotive landscape. With the production volume of vehicles continuing to accelerate, automakers are offloading more components onto tier one suppliers, including most of the powertrain. Due to their close relationship, Tier one suppliers are exposed to the same cost pressures, diverging markets, and regulatory uncertainty facing major car manufacturers. Therefore, they must evaluate their products on a continual basis to ensure competitiveness in the marketplace.

PROTECTING THE POWERTRAIN

The powertrain is one of the most complex and expensive components of a car. Each component must be designed to optimize the performance of the overall package. If a part fails to perform as intended, it compromises the integrity of the entire system. Because even a functional powertrain can result in a rough and unpleasant ride, maintaining peak performance over its life span ranks among a manufacturer's biggest priorities.

But, too often, transmission filters are an afterthought during the design process. Poor performing filters are a common

cause of powertrain problems and, in most cases, can be prevented with the appropriate expertise.

TROUBLESHOOTING FILTRATION

A number of factors contribute to filtration failures. A filter becoming worn before its scheduled replacement is the likeliest culprit, but oversights in the engineering and production of components can lead to long-term issues. If a filter cannot endure normal wear and tear, contaminants that could inflict permanent damage on the powertrain, such as dirt or metal chips, will escape through the sieve. An ill-fitting filter is another threat to the transmission because the flow of fluid is interrupted. Without lubricants to facilitate regular function, other components are placed under undue stress. Regardless of whether a unit is clogged, cracked, or dislodged, a faulty filter and the resultant debris puts the powertrain at risk of grinding to a halt.

A well-integrated transmission filter is a vital part of preventing defects. Since balancing the needs of multiple suppliers can be a slow, frustrating process and produce an inferior product, tier one suppliers must consider partners with complete capabilities. In addition to eliminating headaches and expediting production, working alongside a single, high-end supplier returns control to designers, empowering them to create the strongest product.

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PRECISION FILTRATION FOR FEWER PROBLEMS

A high-performance transmission filter needs to deliver in the harsh environment of an internal combustion engine. It must thrive in torrid conditions for tens of thousands of miles, removing abrasives and particles from the transmission fluid and preserving the performance of the powertrain.

MOLDING EXPERTISE

As the regulatory environment and technologies evolve, the demands being placed on powertrains have increased. In order to fulfill the strict requirements, modern filters feature more complex filter media geometries than older models.

Incorporating each of the filter's elements into a cohesive design is a painstaking process, but its importance cannot be understated. If an individual component does not meet the specific parameters of the original design, then the system could be subjected to an expansive overhaul. A partner with plastic molding expertise is the surest method for ensuring the seamless integration of the entire transmission filter kit.

Finding a molding partner with a proven record of solving

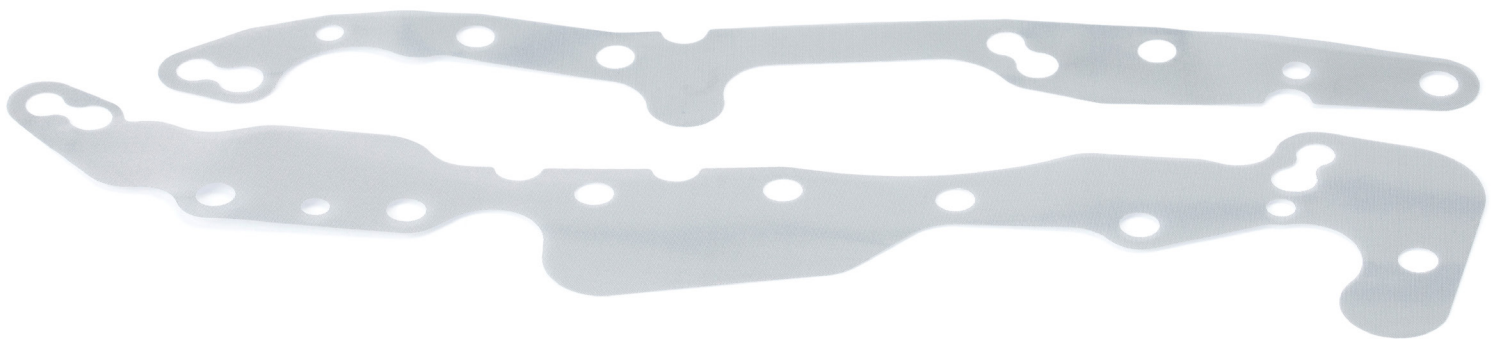
design and manufacturing inefficiencies can instill confidence in senior engineers. A skilled supplier can provide accurate attachment points for materials within the molded, plastic portion of the component. Furthermore, an experienced plastic molding partner can offer a versatile product line, including more complicated components.

PREMIUM MATERIAL

With a wealth of value-adding properties, woven wire cloth is proven to outperform substitute materials for transmission filter media. A customizable design and manufacturing process are among wire mesh's biggest advantages over alternatives. As a result, designers are able to better dictate the filter's dimensions, geometric condition, surface texture, and void fraction.

In addition to manipulating the mesh into the required size and shape, woven wire cloth can be treated to enhance the effectiveness of the filter. A pre-production sintering process strengthens the wire junctions of the element and prevents loose wires on surrounding edges, ensuring continued accuracy in filtration. Also, by pleating and pressing the fabric, the component is given the greatest possible filter area. After it has been put through a series of similar processes, woven wire cloth is capable of withstanding a wider range of

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instantaneous forces, internal pressures, and temperatures without collapsing. The end product is a reliable mesh solution for a multivariate problem.

SURFACE FILTRATION

Surface filtration is the process of retaining particles on the surface of the medium itself. Featuring woven wire cloth as its medium, surface filtration achieves complete retention through careful design and the passage of time. The filter medium is manufactured to the highest degree of precision.

Determining the appropriate mechanism for the filtration process depends on a number of variables including, but not limited to, the desired life span, the composition and distribution of the fluid feed, or the size and shape of the sieve.

HYDRAULIC FILTRATION

The stress imposed upon hydraulic systems is greater than ever given the sophistication of contemporary transmissions. To succeed in spite of the intense strain, hydraulic systems are simultaneously designed to handle higher pressures and filter foreign contaminants.

Most hydraulic system failures can be traced to contaminated fluid affecting core components like the cylinder or pump. Regulating flow and pressure throughout the system is more difficult if contaminated fluid seeps into fine-tuned, sensitive chambers. Silt contamination, a granular, imperceptible material, can cause the complete seizure of equipment if left unchecked.

Proper filtration is the most cost-effective, proactive way to protect hydraulic systems. Designers can maximize the flow of hydraulic fluid and minimize the migration of contaminants by placing filters at strategic locations within the system. A suction filter is a fully-submerged, wire mesh strainer in the reservoir that purifies liquid before reaching the pump. A pressure-line filter is a specialized, often times wire mesh part, placed after the pump but before successive, close-tolerance components, such as actuator or directional control valves. When combined, the pair form a multilayered defense for hydraulic systems, preventing even the finest contaminants and particulates from interrupting operation.

QUALITY MANAGEMENT

Considering the significance of precision in the filtration process, it is crucial to find a competent partner who shares an obsession with the tiniest details.

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A well-filtered transmission is accomplished before it is installed in an engine. Filtration elements require meticulous measurement and manufacturing. A single part that does not match its specification can undermine the effectiveness of the entire design. Eliminating error begins by establishing a clear vision in pre-production. Defined controls and well-managed processes guide production, assuring accurate, reproducible results. In post-production, elements need to be inspected for defective properties. If an element fails its inspection, the process must be repeated until a flawless filter is produced.

Such exacting standards are a requirement for high-performance, trouble-free transmissions.

THE IDEAL PRODUCT FEATURES...

- Durable, high-performance material
- Long, reliable life span
- Filtration with absolute retention
- High mechanical strength
- Corrosion and temperature resistance
- Plastic-molding expertise
- Personnel with proven problem-solving skills
- Continual supply chain
- In-house tooling department for agile, flexible development
- Complete capabilities from a single source

Engineering > Weaving > Tooling > Pleating > Forming > Molding > Inspection > Packaging

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THE W.S. TYLER DIFFERENCE

W.S. Tyler, a leader in woven wire cloth and mesh materials, is equipped with the experience and expertise to be your full-service partner in the specialized development and production of transmission filters.

DIVERSE BACKGROUND

W.S. Tyler holds a unique position in the marketplace as a supplier of high-quality, wire mesh materials. By consolidating all of the necessary expertise into a single source, W.S. Tyler presents tier one suppliers with the opportunity for a more productive, streamlined relationship than separate arrangements.

Considering the complementary areas of expertise, W.S. Tyler is particularly prepared to ensure the seamless integration of each element into a complete filtration system for your transmission. Certified to ISO 9001 and IATF 16949 standards, our experienced team provides close management of the entire production process.

PURPOSE-BUILT SOLUTIONS

At W.S. Tyler, we understand the smallest details can make

the biggest difference. Our passion for precision is a reflection of that knowledge.

W.S. Tyler approaches high-performance filtration with perfectionist determination. As a result, we offer customizable components in order to meet the demands of absolute filtration. With state-of-the-art facilities, including an in-house tooling department and proprietary, high-resolution inspection cameras, W.S. Tyler possesses the resources to turn unconventional design concepts into made-to-order components.

REAL-TIME PROBLEM SOLVING

In the event of an issue during the design or production process, W.S. Tyler is committed to solving problems without sacrificing certain specifications or schedules. A deliberate, thoughtful problem-solving method is required to consistently arrive at ideal outcomes for all stakeholders.

Because of that philosophy, W.S. Tyler is an excellent option for tier one suppliers that are reluctant to abandon direction on their design at the first sign of a problem. By adopting a more measured approach, and formulating a comprehensive solution, we are able to achieve intelligent compromise that does not negatively impact the product's performance.

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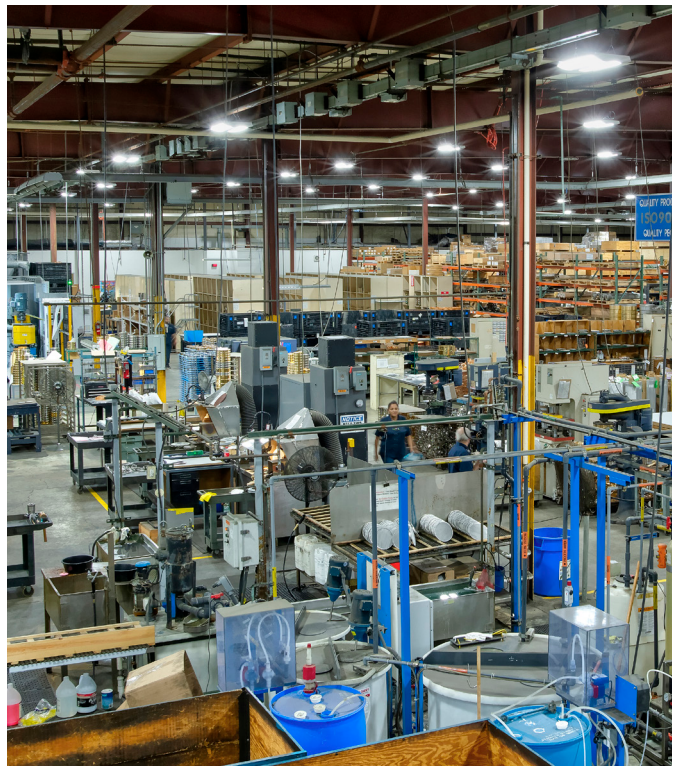


INNOVATIVE PARTNERSHIPS

W.S. Tyler's blend of innovation and tradition allows us to exceed the expectations of our partners. With a wealth of experience and relentless research and development programs, we are prepared for the challenges on the horizon.

While the internal combustion engine is projected to retain its dominant position in the global marketplace in the near future, the coming decades figure to be characterized by transformative change. Modular designs and platform sharing represent a chance for automakers to cut costs. Alternative drive technologies will continue to develop as environmental regulations tighten. Regardless of what form the future takes, proper filtration will remain essential to the performance of next-generation powertrains.

W.S. Tyler is the best partner for capturing growth. Our customers are not just another account. At W.S. Tyler, your strategic priorities become our mission.



GET IN TOUCH

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