



BREATHER ELEMENTS & ASSEMBLIES



Meeting the Challenge for Better Control of Crankcase Emissions in Combustion Engines

CUSTOM-ENGINEERED SOLUTIONS IN KNITTED WIRE MESH

For forty years, Metex design, development, and manufacturing engineers have been producing engineered components that take maximum advantage of the unique characteristics and robust nature of knitted wire mesh. Its interlocked looped structure, which offers excellent resiliency, memory—even when subjected to high temperatures as well as high-tensile or compressive stress—and strength, make knitted wire the ideal choice in materials when both performance and cost are paramount.

Metex products now meet a wide range of critical needs—from providing flexible, yet durable, seals and joints to noise attenuation, thermal insulation, and filtration—in some of the most demanding industrial applications and environments.

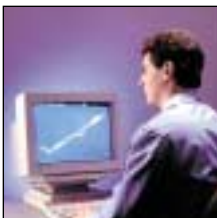
Current and pending environmental legislation has placed stringent demands on crankcase breather systems for internal combustion engines. Reducing such crankcase-emission carryover is not just a federal mandate with some types of engines—it's also a key consumer concern.

Metex has responded to the need for better control over such emissions with prolonged-life, knitted wire mesh breather elements and assemblies. Metex products help dramatically reduce the escape of crankcase emissions from such engine sources as:

- Condensation of crankcase aerosol
- Mechanical shearing from valve springs and other mechanical parts
- Lubricating oil that exits the engine through the crankcase breather tube or assembly

Metex designed and manufactured Breather Elements and Assemblies provide long-lasting performance in reducing crankcase emissions as well as oil consumption and oil pooling on external engine and vehicle parts—while protecting air-intake products in closed-crankcase ventilation (CCV) systems.

Engine manufacturers have also found that Metex Breather Elements and Assemblies provide a greater degree of market differentiation among an increasingly environmentally conscious buying public—helping to improve customer loyalty for specific engine brands.



Complete in-house design, R&D, and test facilities



Flexibility in manufacturing for JIT requirement





PRODUCT BENEFITS

- Long service life—four times more durable than competing products
- Cost-effective—can withstand temperatures between -45°C to 650°C, depending upon material selection
- High separation efficiencies of 95-99% and low pressure drop
- Can vary element density and surface area to solve the most difficult separation problems
- Can accommodate any available engine space
- Easy to install in existing or new cavities or housings
- Ability to combine monofilament or multifilament material into one breather element
- Element can be die formed, layered, or spiral wound



Knitted construction permits production of elements in almost any material, density, thickness, or configuration

Superior Design and Manufacturing for Meeting Custom Emission-Control Requirements

Better, more cost-effective solutions for reducing crankcase emissions
Four decades of experience in designing and manufacturing crankcase-emission filtration systems have made Metex the supplier of choice for all types of consumer- and commercial-vehicle applications, both on- and off-highway.

Due to our unique ability to manufacture Breather Elements and Assemblies from a wide range of ferrous and nonferrous metals, engineered plastics, and composites, Metex emission-control solutions can also be found in equipment designed for use in corrosive and high-temperature environments—such as marine engines as well as consumer and industrial generators and compressors.

In addition, Metex Breather Elements can be made from any material that can be formed into wire—allowing immediate changes in key performance criteria for even the most demanding applications.

Custom engineered to enhance engine performance and reliability

Metex engine-filtration solutions are custom designed for enhanced performance in both open-crankcase and closed-crankcase ventilation systems, as either internal or external devices. Internal devices use baffles (which only remove particles of 5µm or larger) or coalescing filter elements in the cylinder head cover or other locations inside the engine.

External crankcase filtration systems consist of a breather assembly or mechanical device secured directly on the engine or by remote, bracket-mounting. Unlike other systems, Metex Breather Elements and Assemblies are designed to remove both fine and coarse particles, as well as fine oil-mist condensation.

In open-crankcase ventilation systems Metex helps reduce engine oil consumption, the threat of catastrophic engine failure due to oil loss in engines in remote locations, and invalid warranty claims due to deposition of oil on engine and other vehicle parts. They also help eliminate accumulation of oil mist on test-cell equipment.

In closed-crankcase systems, specifying the right Metex Breather Element or Assembly can help reduce warranty service levels due to pooling of lubrication oil in the crankcase pressure control valve, as well as turbocharger intake compressor and intercooler. Metex custom products also reduce the formation of an oil film within the heat exchanger or the aftercooler or intercoolers on certain turbo-charged engines.

Reduced Crankcase Emissions & OEM Costs

Metex has the material-science knowledge, as well as design-engineering and manufacturing expertise, to supply breather elements and assemblies in any size and for any type of engine—with blowby levels ranging from 0.2-40 cubic feet per minute.

From initial inquiry, through prototype development, to low- and high-volume production, you can count on our decades of experience to deliver solutions that solve the most challenging crankcase-emission problems.

In-House Testing Capabilities and Equipment

Metex uses the very latest test equipment and procedures to optimize the design of each Breather Element and Assembly. Variables such as flow rate, temperature, and pressure drop can all be measured and controlled in our custom-designed laboratory.

From initial design, prototype fabrication and testing to full production, our ISO9001 and QS9000 Quality System ensures that we provide only products that offer high quality, performance, durability, and value.



Assemblies can be customized to meet your performance and space requirements

Breather Element Specifications

- **Size**—3-200mm height x 100-250mm diameter (0.125"- 8" height x 4"- 10" diameter)
- **Configuration**—Oval, round, rectangular, triangle, square, or custom-designed to mate with your product
- **Service Life**—Over four times more durable than competing products
- **Engine Location**—Inside valve cover or any new or existing engine cavity or housing
- **Horsepower Range**—No limit
- **Volume**—No limit
- **Efficiency**—95% to 99%
- **Temperature Range**— -45°C to 650°C range, depending on materials
- **Retrofit**—Can be retrofitted to any engine
- **Pressure Control**—Where required, Metex offers a pressure control valve and related hardware to ensure that engine crankcase pressures remain within design specifications

- ▶ **Material Selection:** Aluminum, plain steel, galvanized steel, stainless steel, copper, nylon, ceramic, composite materials—combination of metallic and non-metallic

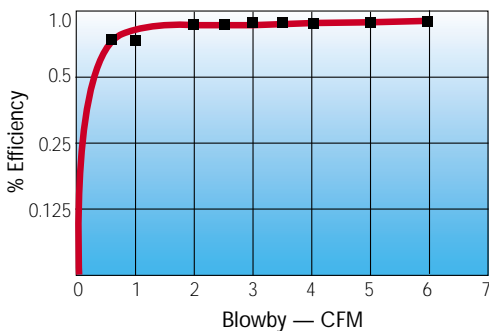
Breather Assembly Specifications

- **Size**—Customized to meet your performance and space requirements
- **Configuration**—Round, square, rectangular, or custom
- **Engine Location**—Inside-engine, on-engine, or remote-mounted to engine
- **Horsepower Range**—No limit
- **Volume**—No limit
- **Efficiency**—95%-99%
- **Temperature Range**— -45°C to 650°C range, depending on materials
- **Retrofit**—Can be retrofitted to any engine
- **Pressure Control**—Pressure control valve can be provided as needed

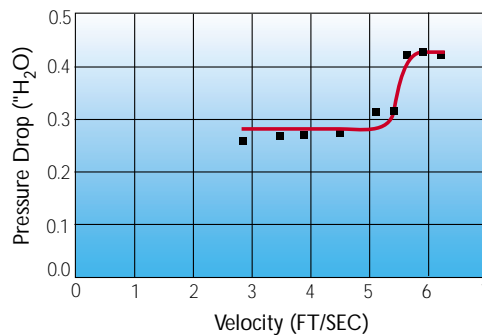
- ▶ **Material Selection:** Aluminum, plastic molded, stamped or fabricated steel—plain, galvanized, and stainless

The information presented in these charts is typical of the test data that is generated to determine the optimum design and performance for a specific breather application.

Efficiency



Differential Pressure vs. Flooding Velocity





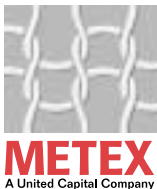
Metex Knitted Wire Mesh Products Solve Problems Cost Effectively

Metex knitted wire mesh is manufactured from an "endless" wire that is formed into loops and subsequently networked, providing elasticity and resilience not found with woven wire or powdered metal products.

The diversity and versatility of wire mesh enables Metex to produce products for a wide variety of applications, including:

- Seals
- Breathers
- Coalescers
- Gaskets
- Heat Shields
- Navin Rings
- Catalytic Converter Support Mesh
- Heat Wicks
- Noise Attenuators
- Mufflers
- Air Filters
- Electronic Shielding
- Ball Joint Seal Systems
- Air Gap Rings
- Filters
- Shock Absorbers
- Protective Coverings
- Exhaust Seals
- Catalytic Converter End Rings
- Flame Arrestors

Our **Breather Elements & Assemblies** continue a longstanding Metex tradition of integrating the right designs, materials, and manufacturing methods to meet customer needs for optimal performance at lowest possible cost.



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