



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.



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



Flexibility in manufacturing for JIT requirements



TECHNICAL BULLETIN NUMBER 111



WIRE MESH EXHAUST CATALYSTS

Knitted Wire Coated Catalysts for Engine, Fuel Cell and Industrial Applications

Metex has been a supplier to the automotive and small engine industries for more than 40 years, delivering the first knitted wire mesh supports for the monolithic catalyst element in an automotive converter assembly. Metex **Coated Exhaust Catalysts** continue our long standing tradition of innovation by offering specialty catalysts and mufflers using knitted wire mesh coated with a variety of precious metals.

Our knitted wire mesh product delivers durability, reduced emissions and decreased backpressure and is cost effective when compared to other substrates. Our designs are customized in a variety of sizes and loadings to exceed the expected performance of your system and meet all applicable emissions and conversion requirements.

Metex mesh substrates reduce oxides of nitrogen (NOx) as well as carbon monoxide (CO), hydrocarbons (HC) and particulate matter (PM)

Reduced Emission Pollutants

Emissions are unhealthy and contribute to air pollution when not properly controlled. Strict emission reductions are an increased concern in small two-stroke and four-stroke engines and targeted by the EPA for reduction. Small engines such as those used in lawn and garden equipment — lawn mowers, tractors, trimmers, edgers, leaf blowers, and chain saws, as well as motorcycles and mopeds—are a significant source of air pollution. These gas and diesel fuel engines emit pollutants such as hydrocarbons (HC), nitrogen oxides (NOx) and carbon monoxide (CO).

Metex mesh catalyst designs successfully reduced these emissions and have replaced standard ceramic and foil substrates due to their cost effective performance and simplicity.



Knitted Wire Mesh—The Cost-effective Alternative to Ceramic and Metallic Foil Substrates

The typical ceramic and metal foil substrates are flow-through designs with well-defined channels parallel to the flow axis of the exhaust gas. Thus it is possible for portions of the exhaust gas to pass through these channels and not come into contact with the channel walls or the precious metal. In order to prevent this, ceramic and metal foil substrate manufacturers increase the cell density (lower the channel opening) and increase the amount of precious metal loading on the substrate. Both of these options increase complexity and cost.

With a knitted wire mesh substrate, however, the wire is randomly dispersed around the substrate so there are no direct passages along the axis of the flow. This ensures that all of the exhaust gas passing through the converter will make contact with the wire mesh substrate and the precious metal. As a result, the surface area (and precious metal loading) of our mesh substrate can be lower than that of a similar performing ceramic or metal foil substrate. Result: lower cost.

In small engine applications, Metex has developed coated substrates for rich-burn and lean-burn applications. In particle-trap applications, the knitted wire mesh substrate in a particulate has the advantage of being very difficult to clog with soot due to the way a typical soot trap works. The standard ceramic trap is almost identical to a converter substrate with the exception that the channels are alternately closed on one end. The exhaust gas travels through one open channel, but since it is blocked on the end, the gas must pass through the wall of the channel and into the adjacent channel where it then travels out the opposite end.

Since the pores in the channel walls must be very small to prohibit the large soot particles from passing through, they clog very easily. As in the case with converter substrates, the mesh substrate for a soot trap relies on the soot particles impacting with the mesh and being retained by the catalyst material (precious or rare earth materials) rather than “filtering” the soot particles through a small pore. Although the main advantage is the anti-clogging nature of the mesh, there are also potential savings in precious metal due to lower substrate loading.

Custom Designed to Enhance Performance

Our engineering staff will work with you from initial inquiry through prototype development and production to develop the proper mesh design and loadings that will effectively meet your compliance and cost requirements.

Product Benefits

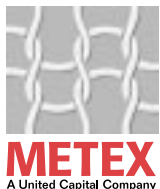
- Cost effective
- Loadings with proprietary precious metals
- Increased mechanical and thermal shock resistance
- Noise reduction
- High efficiencies with decreased backpressure
- Easy to install in existing or new muffler assemblies
- Customized designs to meet your performance and space requirements
- Experienced R&D services to optimize catalyst design and coating

Typical Applications

- Motorcycle
- Mopeds
- Lawn and garden equipment
- Small engine
- Automotive
- Snowmobiles
- ATVs
- Personal watercraft
- Marine engines

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