Agion antimicrobial compound for HVAC, server room, food service and hospital applications. Agion inhibits the growth of bacteria, molds, fungi and other microbes through the release of silver (Ag) ions and can be applied to carbon and stainless steel.
THERE ARE A FEW HUNDRED MILLION YOU MAY HAVE OVERLOOKED.

The world around us is teeming with microbes. Many are harmless, yet some can cause serious illnesses and diseases. Others such as mold and mildew can cause millions of dollars in damage to buildings and property.

Now, there is a way to fight back. Demand for antimicrobial products steadily increases, for personal use, in our homes, schools, and businesses. In fact, it’s now a $1 billion a year industry. Consumers can buy antimicrobial hand cleaners, toys, cutting boards and kitchen utensils, even mouthwash, and deodorant. Now there is a way for manufacturers of HVAC equipment to take part in this rapidly growing market opportunity.

Agion, an antimicrobial additive, is combined with our coating to prevent the surface growth of mold, mildew and bacteria.

Cleanliness is a priority of Woodward Academy in Atlanta, which specified antimicrobial-coated steel for its rectangular ductwork to inhibit the growth of microbes.
Antimicrobial Protection for HVAC Equipment

Now you can offer your HVAC customers a premium product that provides an added measure of cleanliness, thanks to coatings with the Agion antimicrobial compound available exclusively from AK Coatings, Inc., a subsidiary of AK Steel Corporation.

The Agion antimicrobial compound has been registered by the Environmental Protection Agency as an antimicrobial agent which can resist the growth of bacteria, molds and fungi, and can be applied to components throughout the entire HVAC system, including air handlers, ductwork and diffusers.

These coatings can be used on many other carbon and stainless steel products, including commercial refrigeration systems, appliances, and building components. For manufactured HVAC components, coatings are available through authorized shop coaters. Coils of antimicrobial-coated carbon and stainless steel may be purchased from AK Coatings’ steel distributor.

AK Steel’s Research and Innovation Center features Agion Coated Ductwork

Carrier’s top-of-the-line 39 mero air handling units offer the added cleanliness provided by AK Coating’s Agion antimicrobial-coated steel.

The steel is used as an integral material for their prepainted steel inner liner.
Agion® ANTIMICROBIAL STEEL COATING

Benefits and Solutions

HOW IT WORKS
The Agion antimicrobial coating inhibits the growth of bacteria, molds, fungi and other microbes through the release of silver (Ag) ions. The controlled release of silver ions provides continuous antimicrobial protection for the product for the life of the coating.

HVAC BENEFITS
Agion antimicrobial coatings suppress the growth of microbes on HVAC components, keeping them cleaner. While the coatings are not meant to replace routine cleanings, they provide an effective tool in buildings where there is heightened concern about microbial growth, such as hospitals, nursing homes, daycare centers, and schools.

REFRIGERATION
Temperatures below 40 °F inhibit the growth of many microbes, but not all. Even at colder temperatures, Agion antimicrobial-coated steel works to inhibit the growth of bacteria, molds and fungi, whether in walk-in refrigeration units or refrigerated areas or storage facilities.

HOW IT WORKS
Agion antimicrobial compound is an inorganic material whose active ingredient is ionic silver. Encapsulated silver ions are released to the surface of the treated steel where they suppress the growth of destructive microbes.

CARE AND CLEANING
Agion antimicrobial-coated steels can be formed, bent or drawn using conventional fabricating procedures. When cleaning, the surface of the antimicrobial-coated steel product should be cleaned with mild detergent and then air-dried. Harsh abrasive cleaners, strong solvents, and acid-based cleaners can cause coating damage.

STANDS THE TEST OF TIME
The antimicrobial action of the Agion compound maintains its effectiveness over a wide range of temperatures and pH values. Agion antimicrobial-coated steel has completed salt spray testing (ASTM B117), condensing and humidity testing (ASTM D2247), and water immersion testing (ASTM D870). AK Coatings will help you develop a test to evaluate the durability of Agion antimicrobial-coated steel in your specific application.

After 24 hours, an Agion antimicrobial-coated steel surface shows much less bacteria contamination than an uncoated surface.

ANTIMICROBIAL EFFECTIVENESS

![Bacteria suppression graph]

<table>
<thead>
<tr>
<th>Time (hrs.)</th>
<th>Log Colony Forming Units (Counts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>8</td>
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Stainless | Stainless with Agion | Galvanized | Galvanized with Agion
### Coil Coated vs. Shop Coated HVAC Material

<table>
<thead>
<tr>
<th>Properties</th>
<th>Coated</th>
<th>Shop Coated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy</td>
<td>Maximized due to uniformity of coating thickness</td>
<td>Variable due to coating application process</td>
</tr>
<tr>
<td>Coating Adhesion</td>
<td>Maximized due to cleaning/pretreatment prior to coating application</td>
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</tr>
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<td>Coating Durability</td>
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<td>Depends on coating adherence, uniformity</td>
</tr>
<tr>
<td>Coating Hardness</td>
<td>Harder – 2H pencil</td>
<td>Softer – Typically B-HB pencil</td>
</tr>
<tr>
<td>Chemical Resistance</td>
<td>Maximized due to use of epoxy coating</td>
<td>Depends on coating uniformity/adhesion. Coating is acrylic based</td>
</tr>
<tr>
<td>Weldability</td>
<td>Spot weldable due to control of coating thickness</td>
<td>Variable depending on coating thickness</td>
</tr>
<tr>
<td>Formability</td>
<td>Can be bent, drawn, stretched, lock seamed</td>
<td>Limited by adhesion and hardness of coating</td>
</tr>
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<td>Appearance</td>
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</tr>
</tbody>
</table>
The patented AK Coatings process utilizes a coil coating process line.

Galvanized steel is cleaned, pretreated and Agion coated.

Coatings are cured at temperatures above 400 °F.

AK Coatings developed the technology to incorporate the Agion compound into a coating and apply it to stainless and carbon steel.
Coil Coated Ductwork vs. Shop Spray Coating

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<tr>
<td>Testing</td>
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<td>Unknown</td>
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PROCESS FOR PAINTING GALVANIZED STEEL

- Clean: Alkaline based or solvent
- Pretreat: Phosphate, Chromate
- Paint Application
- Cure

ISSUES WITH POST PAINTING GALVANIZED STEEL

- Cleaning/pretreatment
- Poor adhesion/flaking
- Uniform coverage
- In house cost
Advantages of Coil Coated Ductwork

COIL COATED

1.0 mil Prepainted Louvers after 16 months Daytona Beach exposure (fan running).

SHOP COATED

1.0 mil Prepainted Louvers after 16 months Daytona Beach exposure (fan running).
Other Potential Applications for Agion®

ANTIMICROBIAL-COATED STEEL
Not only is Agion Antimicrobial-Coated Steel the right choice to protect from harmful bacteria, mold and mildew, but other potential applications to consider include: residential and commercial kitchens, hospitals and physicians offices.

Please visit our website or contact us for more information.
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www.akcoatings.com

AK Coatings, Inc is a wholly owned subsidiary of AK Steel.

AK Steel is a leading producer of flat-rolled carbon, stainless and electrical steel products, primarily for the automotive, infrastructure and manufacturing, including electrical power, and distributors and converters markets. Through its subsidiaries, the company also provides customer solutions with carbon and stainless steel tubing products, die design and tooling, and hot- and cold-stamped components. Headquartered in West Chester, Ohio (Greater Cincinnati), the company has approximately 9,500 employees at manufacturing operations in the United States, Canada and Mexico, and facilities in Western Europe. Additional information about AK Steel is available at www.aksteel.com.

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Data referring to material properties are the result of tests performed on specimens obtained from specific locations of the products in accordance with prescribed sampling procedures; any warranty thereof is limited to the values obtained at such locations and by such procedures. There is no warranty with respect to values of the materials at other locations.

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