



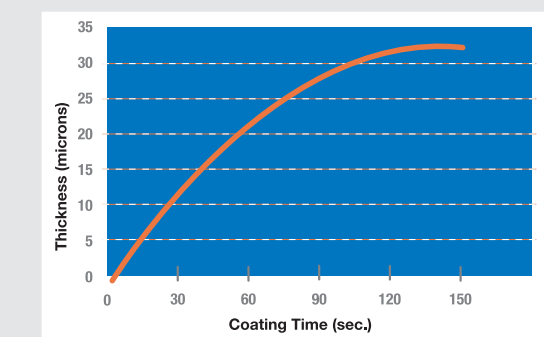
The Smart Coating Solution

The Aquence® process uses a chemical "auto-depositing" method to build coating thickness. Aquence® differs from electrodeposition and electrostatic application methods, because electrical current is not needed to attract pigment and resin to the part. This allows the application equipment and process control to be simpler and lower in cost.

Henkel's patented aqueous, organic coating process efficiently coats parts without the need for complicated and high maintenance equipment, such as anodes and rectifiers. Additionally, the Aquence® process uses fewer process steps, requiring less floor space. Aquence® is also capable of uniformly coating both the inside and outside of complex assemblies with tubular structures and narrow crevices.

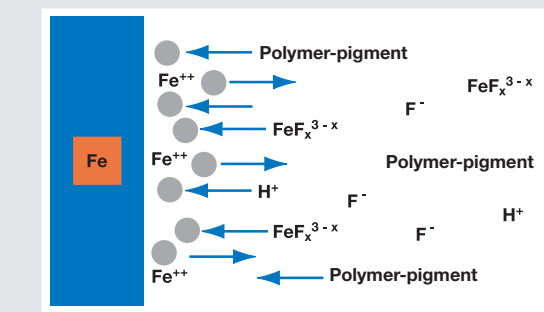
The Aquence® process forms a coating wherever it wets ferrous metal but will not form a coating on rubber or plastic components. It is this characteristic that allows full assemblies to be processed as the coating forms only where needed.

Time Versus Thickness



The autodeposition coating process is "self-limiting" and controllable to exact tolerances

Autodeposition Mechanism



The autodeposition process chemically deposits a uniform, continuous film on the surface of the substrate

Coating Process – Autodeposition Mechanism

- Chemical, not electrical deposition of an organic coating
- Reaction between water-based organic emulsion and metallic surface
- Applied directly over clean metal surfaces (no phosphate pretreatment or conditioner needed)
- Unique among common application methods in its ability to uniformly coat large volumes of densely racked or complex shaped metal parts with fewer process steps and controls

Scanning electron microscopy (SEM) photo shows a consistent coating thickness around the edge of a razor blade

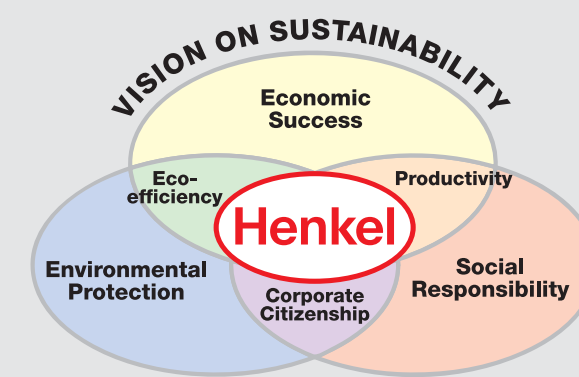


Sustainability – The Foundation of Henkel

Henkel is founded on a deep commitment to deliver services and chemical products that consistently exceed customer expectations while encompassing product safety and ecological compatibility.

The guiding principles of Henkel inspire long-term customer relationships based on reliability, credibility and mutual trust. Henkel continuously develops innovative products and technologies which offer customers benefits in environmental and health protection, and are economically advantageous. This trust is earned by the continued practice of putting the customer first and working to discover new, more effective solutions every day.

With more than 50,000 employees, Henkel continues to expand its diversified range of products and services. Facilities in over 80 countries help ensure Henkel remains a global market leader.



Aquence® Economic Advantages

- Low total costs
- Minimal capital investment
- Reduce in-process manufacturing time
- Increased rack density
- Lower scrap rates
- The ability to process full assemblies



Aquence® Environmental Advantages

- Low or no VOCs (HAPs compliant)
- No phosphate pretreatment
- No heavy metals in the coating process
- Improved transfer efficiency and reduced solid waste
- Lower energy requirements, less maintenance



Aquence® Chemical Coating Process Equipment

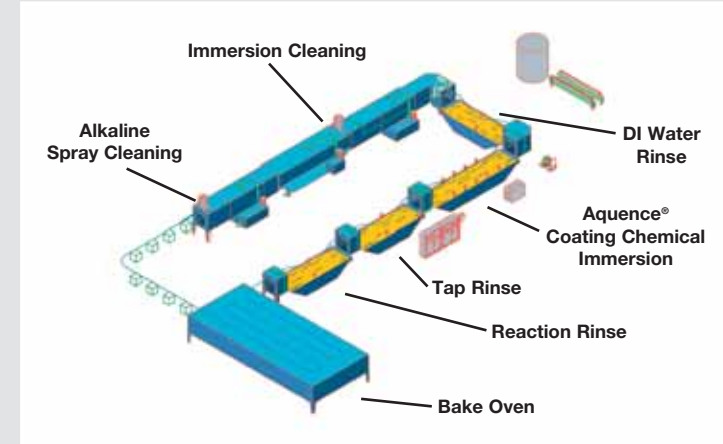


Henkel –
Your worldwide partner

AQUENCE®

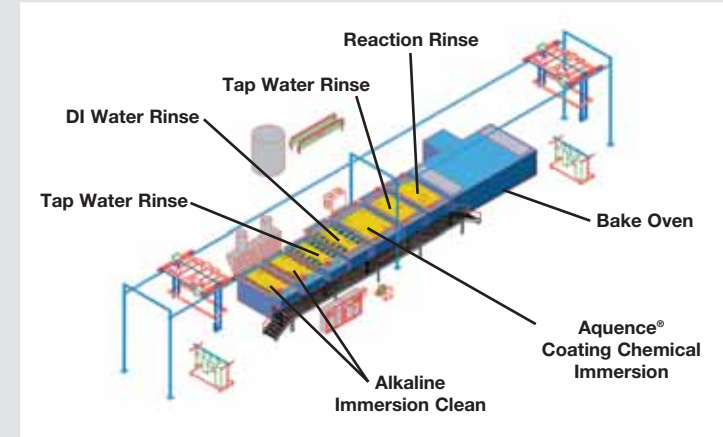
Autodeposition Process The Smart Coating Solution

Typical 7-Stage Conveyor Line



Typical autodeposition equipment layout for conveyor operations

Typical 7-Stage Hoist Line



Typical autodeposition equipment layout for hoist operations



Operational Benefits

Reduces environmental impact

- No heavy metals
- Less energy
- Less water

Improved corrosion performance

- Uniform coating on interior sections

Requires less floor space

- Smaller footprint
- No phosphate pretreatment

Simple and automated bath control

- Solids / Time / Temperature
- Only replenisher, water, and starter required for coating bath

Immediate full performance of coating

- No post cure storage required
- No special rack designs required
- Lower labor costs
- High through-put

Lower capital cost

- Simple racking
- Fewer process stages to build
- Less control / filtering equipment
- No rectifier to buy

Kinder to the environment

- Little or no volatile organic compounds
- No toxic heavy metals
- No electricity needed to drive the reaction
- No flammable or explosive chemistries needed for reaction
- Reduced solid waste

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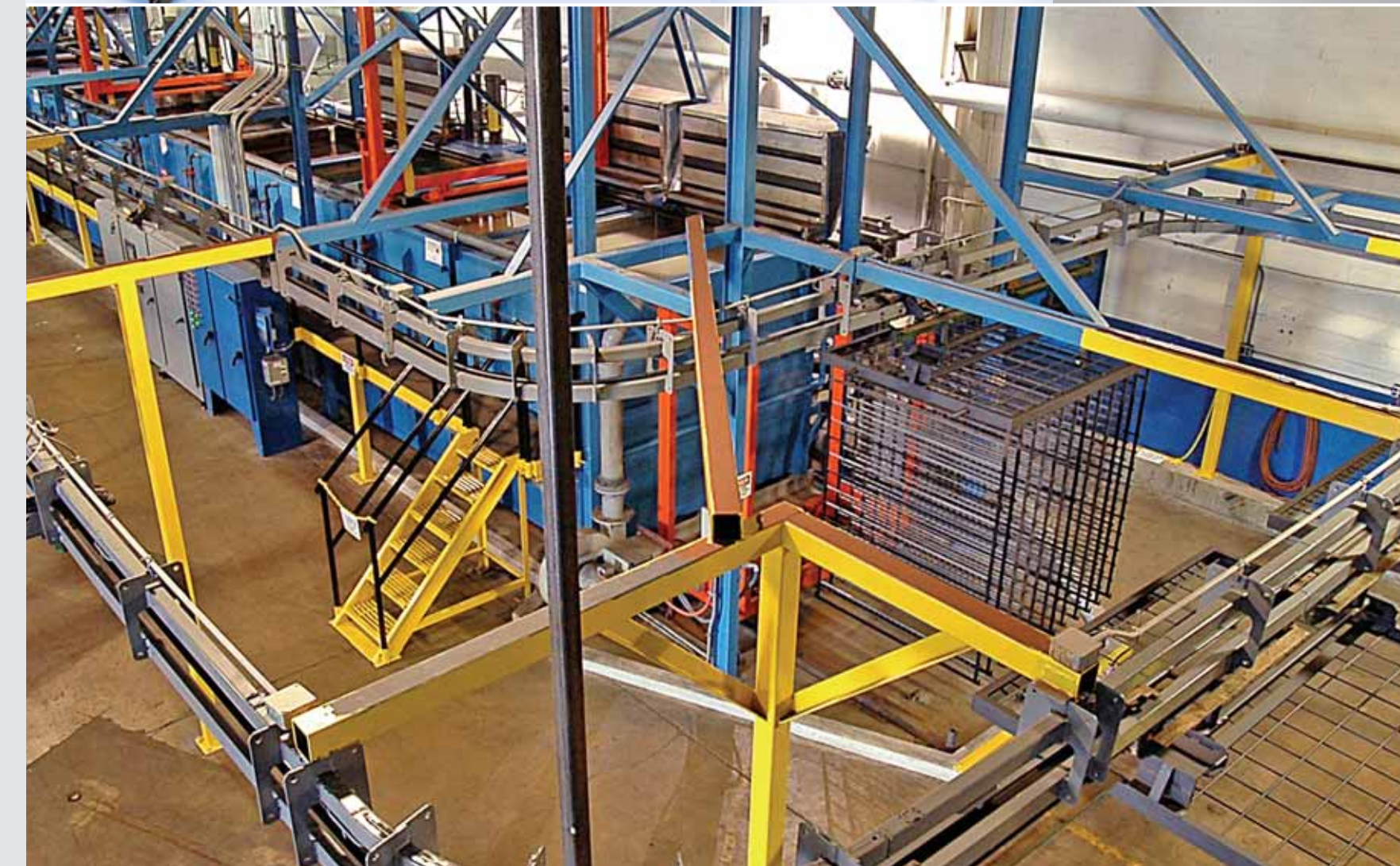
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Notes:

- Excellent corrosion resistance
- No toxic heavy metals
- Zero VOC – low gloss appearance
- Exceptional hardness and flexibility
- **Autophoretic® 800 Series**
PVC-based coating technology
- No toxic heavy metals
- Very low VOC – medium to high gloss
- Good thermal stability
- Good top-coatability
- Excellent corrosion performance
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- Very low VOC – medium to high gloss
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