

Lubricants in the Manufacturing of Emission System Components

Introduction

Emission system components—including catalytic converter shells, inlet/outlet cones, EGR tubes, particulate filter housings, and sensor bosses—are critical for reducing harmful exhaust emissions and meeting stringent global emission norms. These parts are typically manufactured from **stainless steel, high-temperature alloys, or coated steels**, and must withstand **extreme heat, corrosive gases, and thermal cycling**.

Specialized lubricants are essential to ensure **precision forming, clean welding, controlled expansion, and corrosion protection** throughout the manufacturing process.

1. Why Lubricants Matter in Emission System Part Manufacturing

Manufacturing processes such as **tube forming, cone forming, expansion, stamping, trimming, and welding** generate high friction and heat. Proper lubrication helps to:

- **Enable Accurate Forming**
Ensures smooth metal flow during cone forming and tube expansion without cracks or thinning.
 - **Protect Tooling & Dies**
Reduces galling and scoring when working with stainless steels and heat-resistant alloys.
 - **Maintain Weld Integrity**
Low-residue lubricants prevent porosity and contamination in MIG/TIG welds.
 - **Ensure Surface Cleanliness**
Clean internal and external surfaces are vital for catalyst performance and sensor accuracy.
 - **Provide Temporary Corrosion Protection**
Protects parts during storage before catalyst coating or final assembly.
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2. Types of Lubricants Used

Process	Typical Lubricant	Key Benefits
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Tube Forming & Expansion	Polymer-based or semi-synthetic forming lubricants	Uniform expansion, no tearing
Cone Forming / Deep Drawing	Heavy-duty water-based drawing lubricants	Controlled metal flow
Stamping & Piercing	Synthetic or water-soluble emulsions	Clean edges, extended tool life
Trimming & Machining	Light cutting oils or water-miscible coolants	Burr-free cuts
Welding Preparation	Low-residue, weld-compatible lubricants	Strong, defect-free welds
Storage & Handling	Thin-film rust preventive oils	Temporary corrosion protection

3. Benefits to Manufacturers

- **High Dimensional Accuracy** – Precise fit of catalyst substrates and sensors
 - **Superior Weld Quality** – Reliable joints under thermal stress
 - **Reduced Tool Wear** – Longer die and tool life
 - **Lower Cleaning Costs** – Easy removal or burn-off of lubricants
 - **Compliance with Emission Standards** – Clean surfaces support optimal catalyst efficiency
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4. Emerging Trends

- **Burn-Off Lubricants**
Designed to evaporate cleanly during heat treatment without residue.

- **Dry-Film Lubricants**
Pre-coated sheets eliminate wet oils and simplify cleaning.
- **Eco-Friendly Formulations**
Chlorine-free, low-VOC lubricants meeting environmental regulations.
- **Automated Lubricant Application**
Precision spray systems reduce waste and ensure consistency.

EMISSION SYSTEM PART

Description:	441 SS EMISSION SHELLS		
Product:	146-892	Company:	SHILOH INDUSTRIES - WELLINGTON
Industry:	Automotive Tier One	Material:	Stainless Steel
Thickness:	1.5	Concentration:	25
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