

# Lubricants in the Manufacturing of Exhaust Pipes

## Introduction

The **exhaust pipe** is a core component of the automotive exhaust system, responsible for safely channeling exhaust gases from the engine to the tail end while withstanding high temperatures, vibration, and corrosion. Typically manufactured from **stainless steel or aluminized steel tubes**, exhaust pipes undergo multiple forming, bending, expansion, welding, and finishing operations. Specialized lubricants are essential throughout these processes to ensure dimensional accuracy, surface integrity, and production efficiency.

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## 1. Why Lubricants Matter in Exhaust Pipe Manufacturing

Exhaust pipe production involves tube bending, hydroforming, expansion, cutting, and welding — all of which generate friction and heat. Proper lubrication helps to:

- **Enable Smooth Tube Bending**  
Prevents wrinkling, thinning, and cracking during tight-radius bends.
- **Protect Mandrels & Tooling**  
Reduces wear on internal mandrels, rollers, and bending dies.
- **Maintain Surface Finish**  
Preserves stainless or aluminized coatings from scratches and galling.
- **Ensure Clean Welding Zones**  
Low-residue lubricants prevent weld porosity and contamination.
- **Provide Temporary Corrosion Protection**  
Guards against oxidation during storage and transport.

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## 2. Types of Lubricants Used

Process Stage	Typical Lubricant	Key Benefits
Tube Bending	Polymer-based / semi-synthetic bending lubricants	Smooth bends, reduced friction

Tube Expansion & Swaging	High-lubricity water-based lubricants	Uniform diameter expansion
Cutting & End Forming	Light cutting oils / water-miscible coolants	Clean edges, burr control
Welding Preparation	Low-residue, weld-compatible lubricants	Strong, defect-free welds
Mandrel & Die Lubrication	Synthetic high-film-strength oils	Extended tool life
Storage & Handling	Thin-film rust preventive oils	Temporary corrosion protection

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### 3. Benefits to Manufacturers

- **Higher Dimensional Accuracy** – Consistent tube geometry
  - **Extended Tool Life** – Reduced mandrel and die wear
  - **Improved Weld Quality** – Cleaner joints and better strength
  - **Lower Rejection Rates** – Fewer surface defects
  - **Reduced Cleaning Effort** – Easy-to-remove or burn-off lubricants
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### 4. Industry Trends

- **Burn-Off & Ash-Free Lubricants**  
Designed to leave no residue inside exhaust systems.
- **Eco-Friendly Formulations**  
Chlorine-free and biodegradable lubricants.

- **Dry-Film Lubricants for Tube Forming**  
Reduce oil carryover and simplify cleaning.

**Automated Lubricant Application Systems**

Ensure precise dosing and minimal waste.

# Exhaust pipe

Description:

Product:	980-536	Company:	Eberspaecher
Industry:	Automotive OEM	Material:	Stainless Steel
Thickness:	1	Concentration:	50
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