

Lubricants in the Manufacturing of Aluminized Stainless Steel Exhaust Tubes

Introduction

Aluminized stainless steel exhaust tubes are widely used in automotive exhaust systems due to their excellent **corrosion resistance, heat durability, and cost efficiency**. The aluminized coating provides enhanced protection against oxidation, while the stainless steel base ensures mechanical strength and thermal stability.

Manufacturing these tubes involves **tube forming, bending, expansion, trimming, and welding**, where specialized lubricants are critical to preserve coating integrity and ensure dimensional accuracy.

1. Why Lubricants Matter in Exhaust Tube Manufacturing

During processes such as **tube bending, hydroforming, expansion, and welding**, friction and heat can damage both tooling and the aluminized coating. Proper lubrication helps to:

- **Protect Aluminized Coating**
Prevents scratching, flaking, or thinning of the aluminum layer during forming.
 - **Ensure Smooth Tube Expansion & Bending**
Enables uniform deformation without ovality or cracking.
 - **Reduce Tool Wear**
Minimizes galling on mandrels, rollers, and forming dies.
 - **Support Clean Welding**
Low-residue lubricants avoid weld porosity and coating contamination.
 - **Prevent Corrosion Before Assembly**
Temporary rust inhibitors protect tubes during storage and transport.
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2. Types of Lubricants Used

Process	Typical Lubricant	Key Benefits
Tube Bending & Forming	Polymer-based or semi-synthetic forming lubricants	Smooth bends, coating protection

Tube Expansion / Swaging	Heavy-duty water-based expansion lubricants	Uniform expansion, no tearing
Cutting & Trimming	Light cutting oils or water-miscible coolants	Clean cuts, reduced burrs
Welding Preparation	Low-residue, weld-compatible lubricants	Strong, defect-free welds
Mandrel Lubrication	High-lubricity synthetic oils	Reduced mandrel wear
Storage & Handling	Thin-film corrosion preventive oils	Temporary protection

3. Benefits to Manufacturers

- **Improved Forming Quality** – Consistent tube geometry and smooth bends
 - **Longer Tool & Mandrel Life** – Lower maintenance costs
 - **Superior Weld Strength** – Clean weld zones with minimal defects
 - **Lower Rejection Rates** – Reduced coating damage and surface defects
 - **Efficient Cleaning** – Water-soluble lubricants simplify washing
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4. Emerging Trends

- **Burn-Off Lubricants**
Lubricants that evaporate during exhaust heat cycles without residue.
- **Low-Ash & Chlorine-Free Formulations**
Protect catalytic converters from contamination.

- **Dry-Film & Pre-Coated Solutions**
Reduce oil usage and eliminate post-forming cleaning.

- **Precision Spray Application**
Automated systems ensure optimal lubricant dosage.

Exhaust tube 6" O.D. AL409UFSS

Description:	aluminized stainless steel exhaust tube		
Product:	986-00D	Company:	MEC
Industry:	Automotive OEM	Material:	Aluminized SS
Thickness:	1.651	Concentration:	100
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