**Lubricants in the Manufacturing of TENNECO Exhaust Components**

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**Introduction**

**TENNECO**, a global leader in automotive systems, manufactures advanced **exhaust and emission control components** for both passenger and commercial vehicles.
These systems involve **precision forming, bending, welding, and assembly** of high-temperature stainless steel tubes, catalytic converter housings, and muffler shells.
Each step requires **specialized industrial lubricants** to achieve high durability, superior surface quality, and consistent manufacturing efficiency — while ensuring compliance with environmental standards and performance demands.

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**1. Role of Lubricants in Exhaust Manufacturing**

During the production of TENNECO exhaust components, operations such as **tube bending, hydroforming, punching, and robotic welding** generate high levels of **friction, heat, and mechanical stress**.
The right lubricants play a vital role in maintaining **process stability, tool life, and part quality** by:

- **Reducing Friction & Galling:** Ensures smooth forming of stainless steel and Inconel alloys.
- **Extending Tool & Die Life:** Protects expensive forming tools and dies from wear and scoring.
- **Improving Weld Cleanliness:** Low-residue lubricants prevent spatter and weld contamination.
- **Enhancing Surface Finish:** Provides clean, scratch-free appearance for visible exhaust tubes.
- **Preventing Corrosion:** Temporary protective coatings safeguard components before coating or assembly.

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**2. Types of Lubricants Used**

| Manufacturing Process | Lubricant Type | Purpose & Benefits |
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| **Tube Bending & Forming** | Synthetic polymer-based lubricants / vanishing oils (e.g. IRMCO) | Smooth forming, no residue, eco-friendly. |
| **Hydroforming / Expansion** | Water-based forming lubricants / emulsions | Uniform expansion, reduced friction, clean removal. |
| **Cutting, Trimming & Piercing** | Water-miscible cutting fluids / semi-synthetic coolants | Extended tool life, improved precision, easy cleanup. |
| **Welding & Assembly** | Low-residue lubricants / anti-spatter sprays | Cleaner weld zones, fewer defects, reduced rework. |
| **Surface Finishing & Polishing** | Vanishing or micro-lubrication fluids | Smooth surface, ideal for visible stainless parts. |
| **Corrosion Protection** | Solvent-based or dry-film rust preventives | Temporary protection before coating or shipping. |

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**3. Benefits to Manufacturers**

- **Extended Tooling Life:** Lower wear on dies and punches reduces maintenance costs.
- **Improved Dimensional Accuracy:** Consistent lubrication ensures precise forming and welding.
- **Reduced Cleaning Requirements:** Vanishing or low-residue lubricants minimize post-process degreasing.
- **Better Weld Integrity:** Clean, contaminant-free surfaces lead to stronger joints.
- **Enhanced Productivity:** Automated lubrication systems reduce downtime and waste.
- **Environmental Safety:** Modern water-based and biodegradable lubricants meet global VOC regulations.

**4. Trends and Innovations in Exhaust Lubrication**

- **Dry-Film Lubricants:** Replace liquid oils, ideal for pre-coated steel or aluminum tubes.
- **Bio-Based Formulations:** Derived from renewable esters for sustainable production.
- **Precision Spray Systems:** Controlled application minimizes overuse and environmental impact.
- **Dual-Function Lubricants:** Combine forming and rust protection in one formulation.
- **Smart Lubrication Monitoring:** Digital systems track temperature and lubrication rates in real time.

# EXHAUST PART

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| Description: | | | |
| Product: | 980-080 | Company: | TENNECO |
| Industry: | Automotive Tier One | Material: | Stainless Steel |
| Thickness: | 1.2 | Concentration: | 30 |
| Author: | Radoslaw Grochala POLAND | Tags: | |
| Date: | Jan 26, 2012 | | |