

TECHNOLOGY OF PETROLEUM-BASED PLASTIC GREASE WITH VARIOUS FUNCTIONAL PURPOSES

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Plastic grease (also called plasto-grease or structured grease) is a semi-solid lubricant made by thickening a base oil with a soap or other thickening agent. It's called “plastic” not because it contains plastic, but because of its plastic-like, moldable consistency—it holds its shape but can flow under pressure.

How Plastic Grease Is Made

Plastic grease is produced through a controlled blending and chemical reaction process that consists of the following steps:

1. **Base Oil Selection.** Mineral oil (from petroleum refining) or synthetic oils (like PAO or esters) are used. The origin of base oil determines the viscosity, temperature resistance, and lubricity of the final product.

2. **Thickener System.** The soap thickener gives grease its plastic, semi-solid form. Most common soap-based thickeners:

- Lithium soap (most popular)
- Calcium, aluminum, sodium, barium soaps
- Complex soaps (e.g., lithium complex – better heat resistance)
- Non-soap thickeners (clay, silica, polyurea) for special applications

3. **Cooking (Saponification).** Fatty acids (often from animal/vegetable sources or synthetic) react with metallic hydroxides (like LiOH) in a heated base oil. This creates a soap dispersion throughout the oil.

4. **Cooling and Finishing.** After thickening, the grease is cooled while mixing continues to ensure consistency. Additives are introduced at this stage:

- Anti-wear agents (AW)
- Extreme pressure (EP) additives
- Antioxidants
- Corrosion inhibitors
- Colorants or dyes

References

1. ASTM International. (2021). Standard classification and specification for automotive service greases (ASTM D4950). Retrieved from <https://www.astm.org>.
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