



Technical bulletin

How to convert to Mobilgrease™ 33

Compatibility of different brand-name greases

Did you know?

According to ASTM D6185, compatibility is “the characteristic of lubricating greases to be mixed together without significant degradation of properties or performance.”

Summary

Mixing brands of grease should not be taken lightly. If commingled greases are not compatible, the grease intermixing can result in a lower performance. Even where greases are compatible, the replacement grease should be applied in accordance with recommendations from ExxonMobil and aircraft manufacturers.

All greases contain base oils, thickening agents and chemical additives that can interact adversely if incompatible greases are mixed. For example, aviation greases that contain a clay-based thickening agent may be incompatible with greases that are thickened with a lithium complex.



To determine where compatibility problems might exist, ExxonMobil conducted extensive tests on Mobilgrease 33 grease and other commercial greases.

This document summarizes the tests and findings. It also offers technical guidance on how to proceed when the compatibility of greases is less than optimal, and provides recommendations on practical grease-application steps to minimize mixing or to apply grease acceptably when converting to Mobilgrease 33 grease.

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Best practices

No matter what the compatibility between the old grease and the new, refer to the aircraft manufacturer's instructions to ensure compliance. In addition, ExxonMobil recommends the following steps when changing greases:

- 1** Do not use grease mixtures when applying new grease or when regreasing equipment.
- 2** Do not mix the previous grease and the new grease in any bulk grease supply system.
 - Clean out the old grease completely and fill the system with the new grease.
 - Wipe off the old grease from the external parts of the dispensing pump, and then cycle the pump with the new grease until only new grease is dispensed from the delivery line.
- 3** When using a grease gun, wipe out all of the old grease from inside the piston area of the lever-action head, and pump the lever until only new grease appears.
- 4** When regreasing components onboard the aircraft, first remove as much of the old grease from bearing surfaces and internal cavities as possible. Then slowly purge and flush old grease until it is no longer visible and only new grease comes out the exit port of the component (this is a common approach recommended by some aircraft OEMs even during regular regrease intervals without grease conversions).
- 5** Follow legislated or company safety practices.

Recommendations when changing greases

- Always refer to the aircraft manufacturer's instructions prior to changing grease to ensure compliance.
- To optimize grease performance in a particular application and risk associated with mixing greases, ExxonMobil recommends using a single brand of grease fleetwide.
- Develop a robust conversion program to achieve rapid and complete replacement of previous grease.
- Normal regreasing consists of purging the old grease.
- Purging is the process of injecting new grease into the grease fitting until the old grease has been completely removed from the equipment and only new grease is visible.
- If compatibility between a replacement grease and the old grease is less than optimal, we recommend regreasing more frequently than typical intervals to complete transition to the new grease.

Tests to determine compatibility of Mobilgrease 33 with other commercial aviation greases

Grease mixtures of 10/90, 50/50, 90/10 were tested for the following:

- 60X worked penetration
- 100,000X worked penetration
- Dropping point
- Oil separation
- 4-ball wear
- Copper/bronze corrosion

The same grease mixtures aged for 70 hours at 120°C were tested for:

- 60X worked penetration
- 100,000X worked penetration
- Dropping point
- Oil separation

Grease mixtures of 50/50 were tested as is, and also aged for 70 hours at 120°C and tested for:

- Water washout resistance
- 4-ball wear
- Tapered roller bearing rust resistance
- Copper corrosion

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Tests to determine compatibility of Mobilgrease 33 with other commercial aviation greases

ExxonMobil conducted a series of tests on various grease mixtures prepared at room temperature and aged at an elevated temperature:

Grease mixtures of 10/90, 50/50, 90/10 were tested for:	Grease mixtures aged for 70 hours at 120°C were tested for:	Grease mixtures of 50/50 were tested as is, aged for 70 hours at 120°C and tested for:
60X worked penetration	60X worked penetration	Water washout resistance
100,000X worked penetration	100,000X worked penetration	4-ball wear
Dropping point	Dropping point	Tapered roller bearing rust resistance
Oil separation	Oil separation	Copper corrosion
4-ball wear		
Copper/bronze corrosion		

Results of the Mobilgrease 33 compatibility test with other commercial aviation greases

For purposes of the ExxonMobil testing, the following criteria were used to indicate borderline compatibility (or incompatibility in case of excessive performance degradation):

- Penetration changes greater than 30 dmm from weighted average
- Dropping point reductions of 25+°C from weighted average
- Oil separation exceeding 8 percent
- Excessive bronze corrosion
- Failure of roller bearing rust test
- 4-ball wear scar diameter greater than 1 mm
- Water washout exceeding 12 percent

ExxonMobil's testing showed no serious incompatibility encountered with any of the greases tested. Testing was conducted on Mobilgrease 33 and a competitive grease that meets the following specifications:

- MIL-PRF-23827C, Amendment II, Type I
- MIL-PRF-23827C, Type II
- MIL-PRF-81322G

When converting from these greases, we recommend operators take additional precautions.*

For more information

Please contact your ExxonMobil aviation sales representative.

*Refer to page 2 of this document to see best practices and recommendations when changing greases.