

GREASE CONVERSION

Grease Mixing :

Grease mixing is not recommended by Castrol. Best practice is to clean the bearing or coupling free of the old grease and purge with the new / unused grease to be installed.

However there can be situations where purging cannot be carried out due to various reasons. As a result, there can be some grease mixing occurring. Castrol Engineering must be consulted prior to proceeding with any such decision, after which samples should be submitted to the Castrol Technology Deployment Lab in Naperville for testing.

In order to verify mixability of the greases the worst case scenario such as a 50 : 50 grease mix is considered for testing. Greases can have incompatible base oils or incompatible thickeners or both that can cause seizure/failure. Incompatibility may lead to softening, hardening, poor water resistance, poor high temperature performance, and poor roll stability. The chart below shows the typical compatibility of grease thickeners. The Lab runs shear testing of the grease mix by Roll Stability (ASTM D1831) to determine compatibility. If the application is run at elevated temperature, in addition to shear test , Drop Points of the grease mix per ASTM D2265 is run. Please be aware that the results seen in lab tests may differ from results seen in actual field application. Pressure in the lube lines and high temperatures may exacerbate the incompatibility.

Compatible Grease Changeover Procedure

- Minimal mixing of greases is recommended, even if they are compatible
- Run bulk tanks as low as possible before adding new grease
- Purge lube systems and bearings as completely as possible
 - Lube systems should be manually purged by breaking lube lines and running the system continuously
 - Bearings should be purged by increasing lube cycles temporarily
- Standard compatibility test may not show the complete picture
- Performance tests indicative of the application should be run in addition to compatibility
- These tests may include: Roll stability, Water washout, Water spray-off, 4-ball weld load, 4-ball wear, Pumpability, Rust.
- Note: Any tests run with water should use plant water. Test temperatures should be adjusted based on actual conditions (compatibility test, roll stability test).
- Test example: Grease mix will be in a high temp application with high water wash. Roll stability test should be run on a 50/50 grease mix with 10% plant water at 100°C

Incompatible Grease Changeover Procedure

- Before the change-out, bearing temperatures should be checked to establish a baseline. This baseline will be used for comparison during and after the conversion. Any other baseline data should be collected at this time (power usage, visual grease at bearing, etc.).
- Grease compatibility must be tested in the lab. If the greases soften when mixed, more frequent lubrication will initially be needed as the grease will tend to run out of the bearings or be more easily washed away. The worst case scenario is hardening of the greases. This can plug lubrication lines and reduce the effectiveness of the grease in the bearings.
- The lubrication system should be inspected for leaks, stoppages, and failed components. Any problems found should be repaired at this time. Pumps should be tested and replaced or repaired as needed. Lubrication controllers should be checked for proper operation and lubrication cycles verified.
- The lubrication system pump line should be removed from the pump. The pump should be placed in the container of new grease and cycled until the new grease is discharging from the pump. The pump should then be reconnected to the system.
- All lube lines should be broken from the lube points. Cycle the system until new grease is seen at all lube lines. Reconnect lube lines once purged.
- If the bearing seals will not be affected, cycle the system until new grease comes out of the bearings. With the equipment running, cycle the system continuously for at least 20 minutes. This will ensure most of the old grease is purged from the bearings. If seals could be affected, lube cycles should be increased to purge the old grease.
- Once purging is complete, lube system settings should be adjusted back to normal levels.
- The lube system and bearings should be monitored daily for the first two weeks after change-out. The lube system should be checked for plugged lines and proper operation. The bearings should be checked for high operating temperatures and all other data collected and compared to the baseline.

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Grease Thickener Compatibility Chart

C	Compatible	Aluminum Complex	Barium	Barium Complex	Calcium Stearate	Calcium 12-hydroxy	Calcium Complex	Calcium Sulfonate	Clay (Bentone)	Lithium Stearate	Lithium 12-hydroxy	Lithium Complex	Polyurea - Conventional	Polyurea-shear stable	Sodium
B	Borderline														
I	Incompatible														
		Aluminum Complex	Barium	Barium Complex	Calcium Stearate	Calcium 12-hydroxy	Calcium Complex	Calcium Sulfonate	Clay (Bentone)	Lithium Stearate	Lithium 12-hydroxy	Lithium Complex	Polyurea - Conventional	Polyurea-shear stable	Sodium
Aluminum Complex			I	I	I	C	I	B	I	I	I	C	I	C	I
Barium		I		C	I	C	I	B	I	I	I	I	I	C	I
Barium Complex		I	C		I	C	I	C	I	I	B	I	I	B	I
Calcium Stearate		I	I	I		C	I	C	C	C	B	C	I	C	I
Calcium 12-hydroxy		C	C	C	C		B	B	C	C	C	C	I	C	I
Calcium Complex		I	I	I	I	B		I	I	I	I	C	C	C	I
Calcium Sulfonate		B	B	C	C	B	I		I	B	B	C	I	C	I
Clay (Bentone)		I	I	I	C	C	I	I		I	I	I	I	B	I
Lithium Stearate		I	I	I	C	C	I	B	I		C	C	I	C	B
Lithium 12-hydroxy		I	I	B	B	C	I	B	I	C		C	I	C	I
Lithium Complex		C	I	I	C	C	C	C	I	C	C		I	C	B
Polyurea - Conventional		I	I	I	I	I	C	I	I	I	I	I		C	I
Polyurea-shear stable		C	C	B	C	C	C	C	B	C	C	C	C		I
Sodium		I	I	I	I	I	I	I	I	B	I	B	I	I	

This chart should only be used as a guideline. Note that the chart is about grease thickener system compatibility which is only about 10-12% of the grease constituents. >90% of a grease is base oil+ additives which is not taken into account in this chart

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