Incompatibility Testing

Many greases are incompatible towards other grease types. The most common effect is substantial softening, however lithium grease sometimes harden. It is important to note that even if thickeners are generally compatible, two greases may contain clashing base oil or additive formulations. Also, not all thickeners of the same group are compatible with each other. Polyurea grease is an example of this as two polyurea grease formulations in specific cases may not be compatible with each other.

As a general guideline following table could be used to verify compatibility between two different greases:

	B = Borderline C = Compatible I = Incompatible X = Not Applicable	1 Aluminium Complex	2 Barium Complex	3 Calcium Stearate	4 Calcium-12-Hydroxy	5 Calcium Complex	6 Calcium Sulfonate	7 Clay Non-Soap	8 Lithium Stearate	9 Lithium-12-Hydroxy	10 Lithium Complex	11 Polyurea Conventional	12 Polyurea Shear Stable
1	Aluminium Complex	X	I	I	C	I	B	I	I	I	C	I	C
2	Barium Complex	I	X	I	C	I	C	I	I	I	I	I	B
3	Calcium Stearate	I	I	X	C	I	C	C	C	B	C	I	C
4	Calcium-12-Hydroxy	C	C	C	X	B	B	C	C	C	C	I	C
5	Calcium Complex	I	I	I	B	X	I	I	I	I	C	C	C
6	Calcium Sulfonate	B	C	C	B	I	X	I	B	B	C	I	C
7	Clay Non-Soap	I	I	C	C	I	I	X	I	I	I	I	B
8	Lithium Stearate	I	I	C	C	I	B	I	X	C	C	I	C
9	Lithium-12-Hydroxy	I	I	B	C	I	B	I	C	X	C	I	C
10	Lithium Complex	C	I	C	C	C	C	I	C	C	X	I	C
11	Polyurea Conventional	I	I	I	I	C	I	I	I	I	I	X	C
12	Polyurea Shear Stable	C	B	C	C	C	C	B	C	C	C	C	X

For each case, two greases were first tested separately and then blended at three different ratios. The worked penetration test was used on the greases after being blended at room temperature and again after storage at 120°C.

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Changeover Precautions

Where it is absolutely necessary to change the grease type used, there are some precautions that should be taken to minimize the risk of potential incompatibility. First, the following conditions should be met:

1. Verify that the bearing arrangement allows excess lubricant to be purged from the system. Bearing damage may result in sealed-for-life or shielded bearing arrangements.
2. Verify that the bearing is operating properly before switching products. Improper fits, clearances, bearing configurations or existing bearing damage cannot be corrected by changes in lubrication.
3. Verify that the bearing operating condition can accept a full-fill lubrication condition. This procedure should not be applied to bearings designed to operate with limited grease quantities because excessive bearing operating temperature may occur.

Changeover Procedures

Assuming all conditions have been met, the following procedure may be used to change out greases.

1. Use up as much of the old grease as possible before bringing in the new grease.
2. While the bearing is running, slowly pump in the new grease until the excess grease being purged from the bearing changes in consistency or color. This waste grease should eventually appear similar to the new product.
3. Repeat the previous step after one to two hours of operation or after the bearing has returned to normal, steady-state operating condition.
4. Run the bearing for one week (if the previous re-lubrication frequency was greater than one week) and re-lubricate using the normal procedure.
5. Temporarily increase the re-grease volume at least during the first two re-grease intervals. The increased grease flow will help move out any remaining old grease and will provide sealing while overly soft grease may still be in the bearings.
6. Initiate testing (power consumption, amperage draw, re-lubrication frequency, vibration, etc.).
7. Prior to reverting to the original re-greasing interval, sample the purged grease, test its consistency and check for oil separation.

Some additional tips to keep in mind:

- ✓ Always clean grease fittings before re-lubrication.
- ✓ Always pump in grease slowly.
- ✓ Always apply new grease to a bearing while in normal operating conditions.

To avoid lost downtime and serious equipment failure from potential grease incompatibility, it is imperative to proceed cautiously when changing lubricants. Follow the recommendations discussed in addition to those also provided by the OEM.

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