

**Food Safe Ball Bearing Grease, Mobil FM222**

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Food and beverage companies continuously face challenges to meet strict FDA regulations and provide safe products. Processing equipment, which commonly includes ball bearings, is frequently washed with high pressure water and chemicals to maintain a clean, disinfected production environment. This type of environment is extremely tough on bearings. Using knowledge gained from a long history of providing corrosion resistant bearings for food and beverage applications, ABB engineers have developed a new Food Safe bearing designed to thrive in this type of environment. Every aspect of the Food Safe bearing has been optimized for the harsh, washdown environment in which they will be installed. This white paper takes an in depth look at the grease used for the Food Safe bearing and why it was chosen.



**Figure 1: Food Safe ball bearing**

Food grade greases are rated based on the likelihood of coming into contact with food products. Reference Table 1 below for food-grade classifications. In a food processing facility, mounted bearings are often in close proximity, although not direct contact with, food products. For this reason, H1 was selected as the type of grease for the Food Safe bearing. Several different H1 greases from various manufacturers were chosen for testing. Two main properties were identified by which to compare the different greases; resistance to wash-out and performance in a washdown environment.

H1	H2	H3
Food-grade lubricants used in food-processing environments where there is the possibility of incidental food contact.	Food-grade lubricants used on equipment and machine parts in locations where there is no possibility of contact.	Food-grade lubricants, typically edible oils, used to prevent rust on hooks, trolleys and similar equipment.

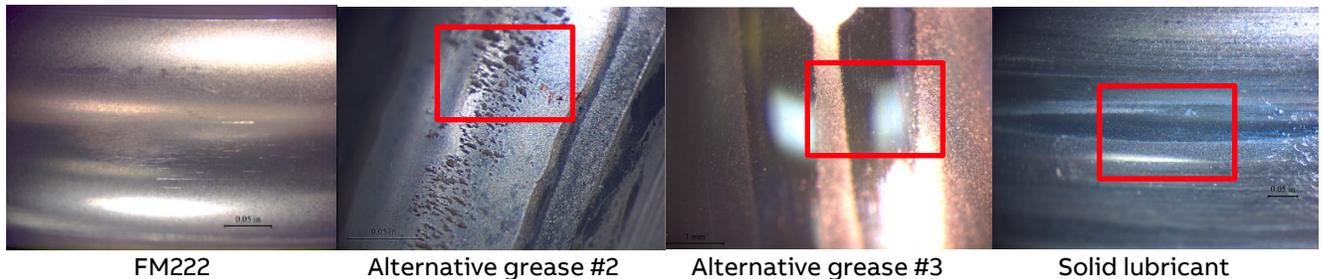
**Table 1: Food-grade lubricants classifications**

To test each for washout resistance and performance, each grease was tested in a machine designed by ABB to simulate a typical washdown environment. An accelerated, 30-day test plan was generated using operational information from customers including typical shaft speeds, operating hours, washdown duration, frequency, and pressure, etc. The test plan was developed to simulate 18 months of operation. Each grease was tested in an identical bearing which were then compared and evaluated. Each bearing was equipped with modified seals to ensure water ingress occurred. Figure 2 shows a side-by-side comparison of FM222 and three competing greases, including a solid lubricant. Test results revealed that Mobil FM222 out-performed the other greases.



**Figure 2: Grease washdown comparison**

The next step was to evaluate bearing performance using each grease. To do this, the bearings were stripped down to individual components and cleaned. Figure 3 shows a side-by-side comparison of the bearing raceways. Signs of damage, including pitting, were evident on the raceways of the bearings that used the competing greases. FM222 showed significantly better performance.



**Figure 3: Raceways of bearings comparison. Pitting and heavy load zones indicated by red box**

In each test, Mobil FM222 outperformed competing greases and, as such, was chosen as the standard grease for Food Safe bearings. FM222 was designed specifically for food processing applications exposed to the rigors of frequent washdown. It is an NLGI 2 grease with an aluminum complex thickener. FM222 is designed to repel water, adding another layer of protection against water ingress and protects bearing raceways from damage while maintaining proper lubricity.

With attention to every detail, the Food Safe bearing has been thoroughly tested to provide the quality and life you would expect from ABB. For lubed for life applications that are likely to come into contact with food products, the Mobil FM222 grease in ABB's Food Safe bearing is the best option available.

Please contact ABB Motors & Mechanical technical support at 864-284-5700 (Option 4), or email us at [brgpttechsupport@abb.com](mailto:brgpttechsupport@abb.com), with any questions.