



Technical Circular

No.: 122/2020

Date: 15th October 2020

Subject: Carriage of Seed Cake in Bulk as per IMSBC Code

1. Seed Cake is primarily used as an ingredient in animal feeds and is the solid residue that remains after edible vegetable oils have been removed from oil-bearing seeds, cereals or other commodities. Oil is extracted either by mechanically crushing the seeds (known as expelling) or by the use of a solvent. However, neither of the two ways used to remove oils and fats from the plant material removes all of the oil and it is the reactivity of the residual oil which gives rise to the hazardous properties of Seed Cakes.
2. The method of extraction and the percentage of oil and moisture remaining will determine which IMSBC Code schedule the seed cake will fall under. An extensive list of the cereals and cereal products from which seed cake can be derived is listed in seed cake schedules of the IMSBC Code.

3. IMSBC Code Schedules:

There are five schedules for seed cake in the IMSBC Code. The schedules define seed cake on the basis of the method of extraction and on the oil and moisture content. These are summarized below:

- a. SEEDCAKE, containing vegetable oil, **UN 1386**, (a) mechanically expelled Seeds, containing more than 10% of oil or more than 20% of oil and moisture combined (**IMSBC Group B**).
 - b. SEEDCAKE, containing vegetable oil, **UN 1386**, (b) solvent extractions and expelled seeds, containing not more than 10% of oil and when the amount of moistures higher than 10%, not more than 20% of oil and moisture combined (**IMSBC Group B**).
 - c. SEEDCAKE, **UN 2217**, with not more than 1.5% of oil and not more than 11%, moisture (**IMSBC Group B**).
 - d. SEED CAKES and Other Residues of Processed Oily Vegetables (**IMSBC Group B**).
 - e. SEED CAKES and Other Residues of Processed Oily Vegetables (**IMSBC Group C**).
4. Seed cakes that have a designated UN number fall into IMDG Code Class 4.2 – substances liable to spontaneous combustion and are categorized as Group B cargoes, which possess a chemical hazard. This can include self heating as a result of oxidation. Due to the additional risks associated with Group B cargoes which have been assigned a UN number, a vessel may only carry them if they are specifically listed on the Document of Compliance for the Carriage of Solid Bulk Cargoes.

5. Hazards associated with the carriage of Seed Cake:

i. Self-heating and Spontaneous Combustion:

- a. The presence of oil and moisture in seed cake cargoes can, through a combination of microbiological activity and oxidation, cause self-heating within the bulk of the stow. Microbiological self-heating, driven by the inherent moisture content, can raise the temperature of the cargo to a point where oxidization of the residual oil occurs. This oxidation can result in further self-heating occurring. Therefore the higher the moisture content the higher the risk of self-heating and spontaneous ignition.
- b. In view of above, the cargo temperature should be regularly monitored both during loading and throughout the voyage at a number of depths within the stow. The use of sounding pipes for obtaining readings is the most common method, but is likely to be ineffective at providing a representative temperature reading of the bulk of the stow.
- c. In order to avoid potential problems when carrying seed cake cargoes, no cargo with a temperature over 55°C should be accepted for loading.
- d. Should the temperature of any seed cake cargo reach 55°C during the voyage and continue to rise then ventilation must be stopped. If self-heating continues then carbon dioxide or inert gas must be introduced to the cargo space.

ii. Oxygen Depletion:

The oxidation of residual oils in the cargo can result in a reduction in the oxygen content of the atmosphere within the cargo hold. Carbon dioxide and carbon monoxide may also be produced as the oils oxidize. Personnel should therefore not to enter any space loaded with seed cake until the atmosphere has been properly ventilated, tested and has been confirmed as safe. Care should be taken to ensure that not only are cargo spaces tested but also that all spaces open to the holds are tested and confirmed as safe for entry.

Persons who may be exposed to the dust of the cargo are to wear a dust filter masks, protective eyewear and protective clothing, as necessary.

iii. Cargo Damage:

Exposure to external sources of heat can cause localized heating and damage to the cargo in the areas where there is direct contact. Possible external sources of localized heat damage can include the following:

- Cargo loaded in holds over heated fuel tanks
- Cargo stowed in holds against hot engine room bulkheads
- Hold lighting being left on when the vessel is loaded

6. Documentation:

As with any IMSBC Code cargo, the Master must be provided with a cargo declaration prior to commencing loading. The cargo declaration, provided by the shippers, should contain sufficient information, as detailed in Section 4 of the Code, to ensure that the cargo can be handled, stowed and carried safely.

This declaration should state:

- Which schedule the seed cake cargo will fall under.
- The method of extraction.
- Where applicable, confirmation that the cargo is substantially free from flammable solvents.

For SEED CAKE, UN 1386 or SEED CAKE, UN 2217, certification, issued by a person recognised by the competent authority of the country of shipment, must be provided by the shipper prior to loading which specifies the oil and moisture content.

When loading SEED CAKES and Other Residues of Processed Oily Vegetables (**IMSBC Group C**) cargo, a certificate issued by a person recognised by the competent authority of the country of shipment is to be provided by the shipper prior to loading, stating that the requirements for exclusion from either the schedule for SEED CAKE UN 1386 or UN 2217, whichever is applicable, are met as set out in those schedules and that the material does not meet the MHB (SH) criteria.

Further, given the confusion between cargoes such as Soya Beans (Grain Code cargo) and Soya Bean Meal (IMSBC Code Seed Cake cargo), it is to be ensured that appropriate information on the cargo has been provided prior to commencing loading.

If the cargo is in a natural state such as beans then it is likely that the Grain Code will apply. If the cargo has undergone any form of processing then the IMSBC Code may apply.

Ship Owners, Operators and Masters of ships engaged in the carriage of solid bulk cargoes are advised to be guided by above.

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