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**Committee of Experts on the Transport of Dangerous Goods  
and on the Globally Harmonized System of Classification  
and Labelling of Chemicals****Sub-Committee of Experts on the Transport of Dangerous Goods****Sixty-fourth session**

Geneva, 24 June-3 July 2024

Item 3 of the provisional agenda

**Listing, classification and packing****Entries for Seed Cake, UN 1386 and UN 2217****Submitted by the Grain and Feed Trade Association (GAFTA)\*****I. Introduction**

1. Seed cake is transported in significant quantities by sea worldwide. Over 350 million tons of seed cakes are transported globally each year. The entries for seed cake includes both mechanically and solvent expelled products and a wide variety of inputs, including rape seed meal, rape seed pellets, soybean meal, cotton seed meal, and sunflower seed meal. Seed cake has long been considered a dangerous good going back to the origins of the United Nations *Model Regulations* based on its self-heating hazard. The moisture content of a seedcake cargo is relevant since high moisture content promotes microbiological activity, which may be responsible for the initial rise in temperature up to about 70 °C and deterioration in the quality of the seedcake. This activity alone will not cause the seedcake to ignite, but it will accelerate oxidation of the residual oil, which in turn can cause the temperature to rise sufficiently to the point at which the seedcake will spontaneously ignite. UN numbers were introduced in the second edition of the *Model Regulations* at which time the current two entries for seed cake were introduced, with very similar requirements. The two entries differ because UN 1386 is assigned to seed cake with more than 1.5 % oil and not more than 11 % moisture whereas UN 2217 is assigned to seed cake with not more than 1.5 % oil and not more than 11 % moisture.

2. The following illustrates changes over the years for comparison. Note that UN 2217 had a special provision which it no longer has and that special provision 29 has changed.

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\* A/78/6 (Sect. 20), table 20.5.



<b>Model Regulations, fourth revised edition</b>			
1386 Seed Cake with more than 1.5% oil and not more than 11% moisture	4.2	III	29 36
2217 Seed Cake with not more than 1.5% oil and not more than 11% moisture	4.2	III	29 142
29 This substance is exempt from labelling and packaging tests but should be marked with the class and group number.			
36 This substance is to be classified under UN 1373 if it contains more than 5% animal or vegetable oil.			
142 Solvent extracted soya bean meal containing not more than 1.5 % oil and 11 % moisture, which is substantially free of inflammable solvent, is considered non-dangerous.			

<b>Model Regulations, twenty-third revised edition</b>									
1386	SEED CAKE with more than 1.5 % oil and not more than 11 % moisture	4.2	III	29	0	E0	P003 IBC08 LP02	PP20 B3 B6	BK2
2217	SEED CAKE with not more than 1.5 % oil and not more than 11 % moisture	4.2	III	29 142	0	E0	P002 IBC08 LP02	PP20 B3 B6	BK2
29 This substance is exempt from labelling, but shall be marked with the appropriate class or division.									
142 Solvent extracted soya bean meal containing not more than 1.5 % oil and 11 % moisture, which is substantially free of flammable solvent, is not subject to these Regulations.									

3. Special provision 142 was added specifically for soybean meal.
4. When the entries were introduced, the *Model Regulations* did not have packing instructions. These were introduced in eleventh revised edition (Rev.11). Currently P003 (less restrictive) is assigned to UN 1386 and P002 (slightly more restrictive) to UN 2217. The rationale for assigning P002 and P003 is also difficult to justify considering the similarities of the entries and since most of the seed cake is shipped in bulk or BK containers as opposed to small packagings.  
  
*Note: When the rationale for assignment of packing instructions was introduced (ST/SG/AC.10/C.3/1997/52 and ST/SG/AC.10/C.3/28), Division 4.2, packing group III goods were assigned P002. When the first detailed list of assignments was proposed (ST/SG/AC.10/C.3/1998/22 and ST/SG/AC.10/C.3/30) UN 1386 was assigned P409 and UN 2217 was assigned P002. When the final list was published (ST/SG/AC.10/25 and ST/SG/AC.10/25/Add.3) UN 1386 was assigned P003 and UN 2217 was assigned P002.*
5. There was an attempt by Germany to address the seed cake entries. The expert from Germany presented an initial proposal for amendment in 2014 (ST/SG/AC.10/C.3/2014/80). In view of the comments they received (ST/SG/AC.10/C.3/92), they came back with a revised proposal (ST/SG/AC.10/C.3/2015/7) which was also rejected as it was deemed too broad (ST/SG/AC.10/C.3/94). In 2016, Spain submitted informal document INF.4 to the fiftieth session of the TDG Sub-Committee highlighting differences as related to UN 1386 in the International Maritime Solid Bulk Cargoes (IMSBC) and International Maritime Dangerous Goods (IMDG) Codes and the *Model Regulations*.
6. During recent meetings of the International Maritime Organization (IMO) Sub-Committee on Carriage of Cargoes and Containers (CCC) the issue of seed cake has been raised. There have been several proposals from China during CCC8, CCC9 and CCC10. The IMO Editorial and Technical Group (E&T) group of the CCC Sub-Committee concluded that any issue related to the classification of seed cake especially with respect to the entries should be addressed by the TDG Sub-Committee. The IMO E&T group recently considered the differences between the *Model Regulations* and the IMDG Code for seed cake.
7. The subdivision of UN 1386 in a) and b) that exists in the IMDG Code does not exist in the *Model Regulations*.

In the *Model Regulations*, the oil and moisture content for UN 1386 differs from those in the IMDG Code. In the Code, UN 1386 entry is divided into:

a) “Mechanically expelled seeds containing more than 10 % oil or more than 20 % oil and moisture combined” and:

b) “Solvent extraction and expelled seeds containing more than 10 % oil and when the amount of moisture is higher than 10 %, not more than 20 % of oil and moisture combined.

8. At the thirty-ninth session of the E&T group which met from 2 to 6 October 2023 they concluded that:

“The intermodal transport of a cargo transport unit (CTU) containing UN 1386 a) is therefore not possible. Consequently, UN 1386 a) should be deleted from the IMDG Code. In addition, the requirements for maximum oil and moisture content for UN 1386 b) are different between the IMDG Code and the UN *Model Regulations*. The difference between UN 1386 b) and UN 2217 is only the oil content; however, transport requirements are identical for both UN numbers. Therefore, the distinction based on oil content is not useful.

IMO recognized that solid bulk cargo shipments of seed cake require different regulatory requirements as opposed to dangerous goods in packaged form (e.g. classification as materials hazardous only in bulk (MHB) which only exists in IMSBC not in IMDG). Bulk solid cargoes are therefore addressed in the IMSBC Code since the IMDG Code, and the UN *Model Regulations* are both applicable to dangerous goods in packaged form. Different classification regimes in the IMSBC Code and the IMDG Code do not cause any problems. However, dangerous goods in packaged form are transported by various modes (e.g. road, rail and sea) where the classification should not differ from mode to mode. Harmonization of classification criteria for UN 1386 and 2217 with the UN *Model Regulations* would facilitate the intermodal transport of these goods when in packaged form and therefore might be considered.”

9. The processing of seed cakes has progressed significantly since UN 1386 and UN 2217 entries were introduced into the *Model Regulations*. Seedcakes are created from the processing of oil-bearing seeds, including soybean, rape, cotton, and sunflower seed. Processing these seeds produces two products – seed cakes (also referred to as protein meals) and vegetable oil. Seed cakes are high in protein and generally used as animal feeds. Vegetable oils derived from oil bearing seeds, including soybean oil, rapeseed oil, cottonseed oil and sunflower seed oil, are valuable commodities with uses in food and increasingly fuel production. Because of the value of these oils, producers are incentivized to remove as much oil from the seed as possible during processing, leaving the seed cake co-product with low oil levels.

10. Furthermore, processors seek to limit moisture content to increase the marketability of their product. Widely used industry contracts, including the *GAFTA Contract No. 97 North American Soybeanmeal*, *ANEC (Brazilian Grain Exporters Association) contract 71 for sales of Brazilian soybean meal* and the *National Oilseed Processors Association (NOPA) Trading Rules for the Purchase and Sale of Soybean Meal* (for products from the United States of America) limit the moisture content in their contract terms to between 12-13 percent. For counterparties using these contracts, products delivered out of these specifications may be subject to a discount.

11. As a result of both dynamics, producers and shippers strive to limit the oil and moisture content of seed cake shipments to minimize costs and maximize the value of their products. Buyers demand uniform products with consistent specifications, and producers seek to meet these requirements to maximize the value they receive from the processing of the oil-bearing seed.

12. There is strong evidence that not all products meet the definition of a Division 4.2 self-heating hazardous material. For instance, seed cake producers, such as those producing soybean meal, use a solvent-extraction process. The U.S. Soybean Export Council (USSEC) conducted tests on forty (40) representative samples from production sites across the United States. In all samples, the N.4 Test method for self-heating substances was negative. Test results are included in the Annex of this document.

13. Both the *Model Regulations* and IMDG Code contain special provision 142 (below) that directly addresses soybean meals. Additionally, GAFTA is of the opinion that the limits should not only be applicable to soybean meals. While China has proposed various limits depending on the source of the seed, GAFTA favors a more simplistic and conservative approach for all seed cakes. The oil and moisture limits differ significantly between the *Model Regulations* and the IMDG Code. Based on shipping experience and data from conducting the N.4 test on various seed cakes, GAFTA believes that the limits for oil and moisture content should be harmonized. GAFTA suggests that the oil and moisture content limits be consistent regardless of whether the seed cake is solvent or mechanically extracted. The propensity for self-heating is limited to only the cakes of oil-bearing seeds. Therefore, GAFTA is proposing to define the term “Seed Cake” in 1.2.1 and are proposing an oil and moisture content criteria of maximum 4 % oil and maximum 15 % oil and moisture combined for rape seed meal, soybean meal, cotton seed meal and sunflower seed meal.

14. Furthermore, GAFTA does not see the need for two separate seed cake entries in the *Model Regulations*.

## II. Proposal

15. In this document it is proposed to:

(a) Add a definition for “Seed Cake” in 1.2.1 as follows:

“*Seed Cake* means the residue remaining after oil and moisture have been extracted mechanically or by a solvent process from oil-bearing seeds such as rape seed, soybean, cotton seed and sunflower seed.”

(b) In the Dangerous Goods List and the Index, remove the entry for UN 2217.

(c) In the Dangerous Goods List and the Index, delete the light type text associated with the UN 1386 entry “with more than 1.5 % oil and not more than 11 % moisture” for UN 1386.

(d) Revise Special Provision 142 and assign it to UN 1386 as follows:

“SP142 Seed Cake containing not more than 4 % oil and 15 % oil and moisture combined which is substantially free of flammable solvent, is not subject to these Regulations.”

*Note: these limits are consistent with the ISMBC Code.*

(e) In packing instruction P002 delete PP20.

## Annex

[English only]

## Soybean Meal Test Results



## CERTIFICATE OF QUALITY

FOR:	U.S. Soybean Export Council (USSEC)
Commodity:	US SOYBEAN MEAL
Testing dates:	FEBRUARY 23 - MARCH 22, 2022
Report Date:	MARCH 23RD, 2022

Results are based solely on the analysis of the submitted sample(s):

USSEC SOYBEAN MEAL TESTING RESULTS							
SAMPLE #	SELF HEATING SUBSTANCES	PROTEIN	OIL	MOISTURE	PH	UREASE	ASH
1. 468-2022-02230017	Negative	46.89%	1.78%	12.43%	6.38	0.03	6.3%
2. 468-2022-02230018	Negative	48.66%	2.34%	10.79%	6.19	0.03	5.9%
3. 468-2022-02230019	Negative	46.81%	1.46%	12.42%	6.32	0.03	7.1%
4. 468-2022-02230020	Negative	47.40%	1.63%	12.59%	6.35	0.03	6.7%
5. 468-2022-02230021	Negative	47.35%	1.47%	13.07%	6.35	0.03	6.6%
6. 468-2022-02230022	Negative	46.97%	1.73%	12.31%	6.32	0.03	6.7%
7. 468-2022-02230023	Negative	46.24%	1.83%	12.43%	6.26	0.03	6.2%
8. 468-2022-02230024	Negative	46.51%	1.76%	12.29%	6.27	0.03	6.8%
9. 468-2022-02230025	Negative	47.28%	1.68%	12.61%	6.33	0.03	6.6%
10. 468-2022-02230026	Negative	47.12%	1.71%	12.61%	6.34	0.03	6.5%
11. 468-2022-02230027	Negative	46.77%	1.48%	12.13%	6.28	0.03	6.2%
12. 468-2022-02230028	Negative	46.85%	1.35%	12.52%	6.36	0.03	6.9%
13. 468-2022-02230029	Negative	46.09%	2.34%	11.66%	6.31	0.03	5.9%
14. 468-2022-02230030	Negative	45.71%	2.25%	11.77%	6.29	0.03	5.9%
15. 468-2022-02230031	Negative	46.54%	2.56%	11.65%	6.33	0.03	5.9%
16. 468-2022-02230032	Negative	46.22%	2.68%	11.61%	6.27	0.03	6.0%
17. 468-2022-02230033	Negative	45.92%	2.86%	11.71%	6.28	0.03	5.9%
18. 468-2022-02230034	Negative	46.18%	2.45%	11.73%	6.30	0.03	5.8%
19. 468-2022-02230035	Negative	45.98%	1.97%	11.81%	6.30	0.03	5.9%
20. 468-2022-02230036	Negative	45.66%	2.02%	11.74%	6.27	0.03	5.9%
21. 468-2022-02230037	Negative	45.97%	2.19%	11.80%	6.33	0.03	6.0%
22. 468-2022-02230038	Negative	45.61%	2.27%	11.74%	6.34	0.03	6.1%
23. 468-2022-02230039	Negative	46.19%	1.73%	11.78%	6.28	0.03	6.2%
24. 468-2022-02230040	Negative	45.73%	2.19%	11.31%	6.31	0.03	6.0%
25. 468-2022-03040007	Negative	49.65%	0.42%	10.81%	6.68	0.03	6.0%
26. 468-2022-03040008	Negative	45.83%	1.01%	12.35%	6.71	0.03	6.6%
27. 468-2022-03040009	Negative	45.53%	0.93%	12.37%	6.73	0.03	6.9%
28. 468-2022-03040010	Negative	46.18%	1.01%	12.76%	6.68	0.04	6.5%
29. 468-2022-03040011	Negative	46.38%	1.10%	12.45%	6.64	0.03	6.5%
30. 468-2022-03040012	Negative	47.01%	0.96%	11.93%	6.62	0.03	6.5%
31. 468-2022-03040013	Negative	46.79%	1.21%	12.01%	6.60	0.03	6.5%

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**CERTIFICATE OF QUALITY**

<b>USSEC SOYBEAN MEAL TESTING RESULTS</b>							
32. 468-2022-03040014	Negative	46.30%	1.05%	12.09%	6.60	0.03	6.5%
33. 468-2022-03040015	Negative	46.38%	0.89%	12.40%	6.61	0.03	6.4%
34. 468-2022-03040016	Negative	46.26%	1.00%	12.73%	6.59	0.03	6.4%
35. 468-2022-03040017	Negative	46.34%	1.18%	12.50%	6.60	0.04	6.7%
36. 468-2022-03040018	Negative	46.37%	1.18%	12.43%	6.59	0.03	6.6%
37. 468-2022-03040019	Negative	46.33%	1.08%	12.53%	6.58	0.03	6.4%
38. 468-2022-03080010	Negative	48.15%	1.18%	10.85%	6.61	0.03	7.0%
39. 468-2022-03080011	Negative	47.35%	1.35%	12.05%	6.62	0.03	7.0%
40. 468-2022-03080012	Negative	47.27%	1.69%	12.53%	6.65	0.03	6.8%

NOTE: A "Negative" result is obtained if there is no spontaneous ignition or if the temperature of the sample does not exceed the oven temperature by 60°C.

Test:	Methods:
Self-Heating Substances	UN N.4 (33.4.6)
Crude Protein	AOCS Ba 4e-93
Crude Fat	AOCS Ba 3-38
Moisture	AOCS Ba 2a-38
pH	AOAC 981.12
Urease Activity / pH Rise	AOCS Ba9-58
Ash	AOCS Ba 5a-49