



**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-fifth session**

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Item 3 of the provisional agenda

Listing, classification and packing**Entries for seedcake, UN 1386 and UN 2217****Submitted by the Grain and Feed Trade Association (Gafta)*****I. Introduction**

1. This proposal is based upon the discussions held with experts during and after the sixty-fourth session of the Sub-Committee, and is supplemental to document ST/SG/AC.10/C.3/2024/10. This proposal is intended to simplify and harmonize the regulatory requirements related to seedcakes for soybean meal, rape seed meal, sunflower seed meal and cotton seed meal.

2. Seedcake is transported in significant quantities by sea worldwide. Over 350 million tons of seedcakes are produced globally each year. The entries for seedcake include both mechanically and solvent expelled products and a wide variety of inputs. Seedcake has long been considered a dangerous good going back to the origins of the United Nations *Model Regulations* based on its self-heating hazard.

3. The current two entries for seedcake were introduced in the second edition of the *Model Regulations*, with very similar requirements. The two entries differ because UN 1386 is assigned to seedcake with more than 1.5 per cent oil and not more than 11 per cent moisture whereas UN 2217 is assigned to seedcake with not more than 1.5 per cent oil and not more than 11 per cent moisture. Gafta believes that the data collected up to date and provided herein (see also annex), will show that there is no need for two entries and validate a more appropriate level of regulation for these commodities.

4. During recent meetings of the International Maritime Organization (IMO) *Sub-Committee on Carriage of Cargoes and Containers (CCC)* the issue of seedcake has been discussed. There have been several proposals from China during CCC8, CCC9 and CCC10 sessions. The IMO Editorial and Technical Group (E&T) group of the CCC Sub-Committee concluded that any issue related to the classification of seedcake especially with respect to the entries should be addressed by the TDG Sub-Committee. The IMO E&T group

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

recently considered the differences between the *Model Regulations* and the International Maritime Dangerous Goods (IMDG) Code for seedcake.

5. The processing of seedcakes 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, sunflower and cotton seed. Processing these seeds results in two products – seedcakes (also referred to as protein meals) and vegetable oil. Seedcakes are high in protein and generally used as animal feeds. Vegetable oils derived from oil bearing seeds, including soybean oil, rapeseed oil, sunflower seed oil and cottonseed 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 seedcake with low oil content.

6. Special provision 142 was added specifically for soybean meal. We support the intent of special provision 142 but are unclear as to why it is limited to soybean meal only and believe that the moisture and oil limits are too conservative. The four seed types highlighted in this proposal have similar chemical and physical properties. Restricting the oil and moisture contents of these seed types will eliminate the risk of self-heating. The data presented in the addendum shows that a limit of 4 per cent oil and 13 per cent moisture is well within the safe range to prevent microbiological activity and oxidation of the oil, which would lead to self-heating.

7. For this proposal and consistent with industry practices, Gafta is only referring to seedcake derived from soybeans, rapeseed or canola, sunflower seeds and cotton seeds. These four seed types are the most commonly used in the manufacture of seedcake and all have similar physical and chemical properties. We intend to include a general definition for UN 1386 entry and a revised special provision (SP) 142:

“UN 1386: seedcake expelled mechanically or by a solvent process from oil bearing seeds.”

“SP142: Seedcake of soybean, rapeseed, sunflower seed and cotton seed containing not more than 4 per cent oil and not more than 13 per cent moisture, which is substantially free from flammable solvent is not subject to these regulations.”

8. Historically, the two parameters that have been measured and utilised by industry and regulators for the safe transport of seedcake have been percent oil content and a combined percent oil and moisture content. We are proposing to simplify the regulatory language by changing the parameters to percent oil content and percent moisture content. This is consistent with international agreements on the production and shipment of seedcakes, and consistent with how they have been shipped internationally for decades both in bulk and in container loads.

9. Measuring moisture content in these products is relevant to transport safety, because high moisture content can promote microbial activity. The lower the moisture content, the less microbial activity is possible. Microbial activity is what causes seedcakes to start self-heating. Based upon the global data collected by Gafta, a moisture content of 13 per cent or less reduces microbial activity and prevents the self-heating of the commodity.

10. If microbial activity is allowed to occur unchecked, then the temperature of the seedcake can rise to a level where, if there is sufficient oil present, it could create a combustible environment. Therefore, by controlling the moisture content and oil content, this commodity can be safely shipped as an unregulated material, because the self-heating hazard is mitigated. Based upon the global data collected by Gafta, a moisture concentration of 13 per cent or less and an oil concentration of 4 per cent or less eliminates the risk of self-heating, and therefore combustibility.

11. Some seedcakes show a higher tendency of self-heating due to the higher content of unsaturated oils which is translated into a higher iodine value e.g. 190 for linseed oil. This is not the case for the four seedcakes concerned including soybean meal, rapeseed meal, sunflower seed meal and cotton seed meal which have iodine values below 140. The *Codex*

*Standard on Named Vegetable Oils*¹ provides further evidence that each of these four seed types have iodine values below 140.

12. The test required to determine whether materials are a self-heating hazard is Test N.4, *Test method for self-heating substances*. As evidenced by the data provided, all the samples taken of these types of seedcakes passed the N.4 test, except one. That sample was a sunflower seedcake with an oil content of 9.4 per cent and a moisture content of 5.05 per cent. The oil content of this mixture was 2.3 times higher than the proposed value, which is likely what led to the failed test. It is important to note that the N.4 test does not measure the microbial conditions for seedcakes, only whether there is sufficient oil to oxidise. For this specific sample, the moisture level is very low, and that would have likely prohibited microbial activity, and therefore reduced the probability that this product would self-heat.

13. During the sixty-fourth session of the Sub-Committee, the expert from Cefic inquired on the risk of residual solvent in the seedcake. The International Maritime Solid Bulk Cargoes (IMSBC) Code requires the seedcake to be “substantially free” of solvent, prior to transport. The question was how to measure “substantially free” and could enough solvent be present to create a flammability hazard. Across industry, hexane is utilized to extract the oils from seedcakes. The cost of hexane is prohibitive, which means that the industry practices ensure that almost all the hexane is recaptured to be used again, prior to transport. Additionally, certain seedcakes are toasted at the end of their processing, which would eliminate any anti-nutritional factors in the seedcake, including the solvent (hexane). Typically, there is no more than 500 ppm of solvent remaining in the seedcake.

14. Based upon the data provided, it is our position that if these seedcakes are shipped with a moisture content of 13 per cent or less, and an oil content of 4 per cent or less, then the self-heating risk is mitigated, and they should not be regulated as a dangerous good. If a seedcake exceeds either or both of those parameters, then the N4 test would be required, and the result of that test would determine whether that product is a regulated commodity.

15. Billions of tons of seedcake have been safely transported by bulk vessel and container loads for decades, within global contract standards without any incidents. This proposal is intended to provide data to justify a reasonable limit for determination when these products should be regulated and when they are not a risk in transport. This simplified approach will allow harmonisation across the modal requirements and ensure that this crucial commodity can be efficiently and safely transported around the world.

II. Proposal

16. In this document it is proposed to:

- (a) In the Dangerous Goods List and the Index, remove the entry for UN 2217.
- (b) In the Dangerous Goods List and the Index, replace the existing text associated with the UN 1386 entry with “Seedcake expelled mechanically or by a solvent process from oil bearing seeds.”
- (c) Revise special provision 142 and assign it to UN 1386 as follows:

SP142 “Seedcake of soybean, rapeseed, sunflower seed and cotton seed containing not more than 4 per cent oil and not more than 13 per cent moisture, which is substantially free of flammable solvent, is not subject to these Regulations.”

- (d) In packing instruction P002 delete PP20.

¹ Codex standard for named vegetable oils codex stan 210-1999.

Annex

Gafta data collection

Soybean meal (UN N4)			
Sample no	Self-Heating result	oil	moisture
1	Negative	1.67%	11.97%
2	Negative	2.32%	11.96%
3	Negative	1.47%	11.99%
4	Negative	1.55%	12.19%
5	Negative	1.69%	12.02%
6	Negative	1.48%	12.03%
7	Negative	1.60%	12.33%
8	Negative	1.60%	12.37%
9	Negative	1.58%	12.36%
10	Negative	1.62%	12.41%
11	Negative	1.36%	12.38%
12	Negative	1.48%	12.50%
13	Negative	0.89%	12.49%
14	Negative	2.24%	12.57%
15	Negative	0.98%	12.57%
16	Negative	2.52%	12.58%
17	Negative	2.28%	12.86%
18	Negative	2.25%	12.84%
19	Negative	2.35%	12.77%
20	Negative	2.18%	12.73%
21	Negative	2.05%	12.85%
22	Negative	3.31%	12.83%
23	Negative	2.68%	12.81%
24	Negative	2.72%	12.88%
25	Negative	2.53%	12.81%
26	Negative	2.64%	13.07%
27	Negative	2.73%	13.11%
28	Negative	2.50%	12.28%
29	Negative	2.28%	12.40%
30	Negative	2.33%	12.58%
31	Negative	1.71%	12.76%
32	Negative	1.98%	12.46%
33	Negative	2.08%	12.40%
34	Negative	1.67%	11.99%
35	Negative	1.75%	11.89%
36	Negative	1.40%	11.98%
37	Negative	1.98%	11.72%
38	Negative	1.76%	11.78%
39	Negative	2.03%	12.71%
40	Negative	3.08%	12.60%
41	Negative	2.06%	12.46%
42	Negative	2.66%	12.44%
43	Negative	2.68%	12.86%
44	Negative	2.81%	12.57%
45	Negative	1.54%	11.66%
46	Negative	1.53%	12.36%
47	Negative	1.42%	11.73%
48	Negative	1.48%	11.90%
49	Negative	1.51%	11.91%
50	Negative	1.48%	11.95%
51	Negative	1.85	12.74
52	Negative	1.38%	10.48%
53	Negative	1.22%	10.56%
54	Negative	1.38%	11.38%
55	Negative	1.30%	11.41%
56	Negative	1.49%	11.61
57	Negative	1.88%	11.34%
58	Negative	1.47%	12.38%
59	Negative	2.50%	11.50%
60	Negative	1.76%	12.47%
61	Negative	1.46%	12.89%
62	Negative	2.50%	12.50%
63	Negative	2.08%	12.95%
64	Negative	3.71%	11.61%

65	Negative	2.50%	13.00%
66	Negative	4.36%	11.36%
67	Negative	3.78%	12.68%
68	Negative	4.38%	12.30%
69	Negative	3.51%	13.27%
70	Negative	5.00%	11.50%
71	Negative	4.50%	12.20%
72	Negative	5.00%	12.50%
73	Negative	1.78%	12.43%
74	Negative	2.34%	10.79%
75	Negative	1.46%	12.42%
76	Negative	1.63%	12.59%
77	Negative	1.47%	13.07%
78	Negative	1.73%	12.31%
79	Negative	1.83%	12.43%
80	Negative	1.76%	12.29%
81	Negative	1.68%	12.61%
82	Negative	1.71%	12.61%
83	Negative	1.48%	12.13%
84	Negative	1.35%	12.52%
85	Negative	2.34%	11.66%
86	Negative	2.25%	11.77%
87	Negative	2.56%	11.65%
88	Negative	2.68%	11.61%
89	Negative	2.86%	11.71%
90	Negative	2.45%	11.73%
91	Negative	1.97%	11.61%
92	Negative	2.02%	11.74%
93	Negative	2.19%	11.60%
94	Negative	2.27%	11.74%
95	Negative	1.73%	11.78%
96	Negative	2.19%	11.31%
97	Negative	0.42%	10.81%
98	Negative	1.01%	12.35%
99	Negative	0.93%	12.37%
100	Negative	1.01%	12.76%
101	Negative	1.10%	12.45%
102	Negative	0.98%	11.93%
103	Negative	1.21%	12.01%

Gafta data collection	Rapeseed meal/canola meal (UN N4)		
Sample no	Self Heating	Crude fat	Moisture
1	Negative	2.9	10.85
2	Negative	3.07	10.52
3	Negative	5.47	10.19
4	Negative	4.56	10.4
5	Negative	10.3	9.5
6	Negative	9.7	9.6
7	Negative	8.56	10.75
8	Negative	2.75	9.8
9	Negative	6.41	10.38
10	Negative	11.32	8.08
11	Negative	1.66	10.38
12	Negative	1.84	9.51
13	Negative	2.9	11.9
14	Negative	3	12.5
15	Negative	2.9	11.3
16	Negative	3.99	11.3
17	Negative	2.32	16.89
18	Negative	10.2	10.9
19	Negative	9.8	10.7

Gafta data collection: sunflower seed meal (UN N4)			
Sample no	Self Heating	Crude fat	Moisture
1	negative	1.1	8.5
2	negative	1.4	9.2
3	negative	1.28	10.6
4	negative	1.19	9.92
5	negative	1.85	10.2
6	negative	1.23	10.57
7	negative	1.4	9.15
8	negative	1.69	9.32
9	negative	0.81	10.26
10	negative	0.7	9.08
11	negative	1.45	10.85
12	negative	1.42	10.84
13	negative	7.92	10.07
14	negative	7.91	6.98
15	negative	4.27	8.21
16	POSITIVE	9.31	5.05
17	negative	3.63	12.41
18	negative	4.64	11.3
19	negative	1.4	10.1
20	negative	2.2	10.2
21	negative	2	12.5
22	negative	6	12.2
23	negative	5.4	11.8

Gafta data collection: cotton seed meal (UN N4)			
Sample no	Self Heating	Crude fat	Moisture
sample 1	Negative	1.52	10.1
sample 2	Negative	2.49	11.5
sample 3	Negative	1.66	10.38
4	Negative	1.84	9.51
5	Negative	2.14	11.59
6	Negative	3.73	10.68
7	Negative	5.07	9.97
8	Negative	6.2	9.28
9	Negative	8.06	8.2
10	Negative	2.26	13.05