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UPDATED IMDG CODE REQUIREMENTS FOR THE CARRIAGE OF CHARCOAL

BY

DR JIM MERCURIO



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A recent investigation into a containership fire served as a timely reminder of the hazards associated with the carriage of charcoal cargoes. The well recognised principal hazard is the propensity of charcoal to self-heat to ignition, with this topic discussed in a previous article published on the Burgoynes website in 2022¹. That article also outlined the IMDG Code requirements for the carriage of charcoal that were in-force at the time. In this regard, the IMO Maritime Safety Committee adopted, in May 2024, Amendment 42-24 of the IMDG Code, which introduces stricter rules relating to the carriage of charcoal that will, no doubt, be welcomed within the maritime community.

Amendment 42-24 came into transitional effect at the start of this year, meaning that it can now be applied voluntarily. It will become mandatory from 1 January 2026.



Photograph 1 – A container carrying a consignment of charcoal, which was on fire.

Amendment 42-24

The applicable UN number for charcoal in the IMDG Code is UN 1361 "CARBON of animal or vegetable origin", in IMDG Hazard Class 4.2 – substances liable to spontaneous combustion.

¹ https://www.burgoynes.com/articles/2022/11/fires-involving-containerised-cargoes-of-charcoal



This UN number previously had Special Provisions that allowed exemption from the requirements of the Code (Special Provisions 223 and 925). Special Provision 223 allowed a cargo to be exempted if, when tested, its chemical and physical properties did not meet the criteria for a listed class or division (in this case, Class 4.2). Special Provision 925, which was discussed in our 2022 article, exempted cargoes on the grounds of their performance under a standard UN self-heating test (Test N.4). Burgoynes has encountered many cargoes that were reportedly exempt on the basis of this provision, but still caught fire.



Photograph 2 – A consignment of charcoal burning inside a container.

In Amendment 42-24, Special Provisions 223 and 925 are no longer applicable to charcoal cargoes and are replaced with Special Provision 978. This provision has been reproduced in full at the end of this article, but the key points can be summarised as follows:

- 1. Charcoal must be declared as Dangerous Goods, with no exemptions allowed.
- 2. The material must be treated prior to packing, unless otherwise approved by the competent authority.
- 3. The material cannot be packed if its temperature is above 40°C.
- 4. Specific stowage arrangements within containers must be followed, which relate to the provision of air gaps and spacing between the packages.

The requirement for all charcoal to be declared as Dangerous Goods reflects the hazardous nature of the cargo, which may have been going unnoticed in cases where the previous exemptions (*via* Special Provision 223 and/or 925) had been applied. Removal of these exemptions means that all charcoal cargoes should be properly declared as UN 1361 in IMDG Code Hazard Class 4.2, allowing carriers to more accurately understand the risks associated with the cargo.



Photograph 3 – The IMDG Code placard on a container declared as carrying charcoal.

In terms of treating the cargo prior to packing, Special Provision 978 states that the material must either be "weathered" in the open air for at least 14 days, or that it must undergo treatment after pyrolysis. The latter involves the application of steam and cooling, packing the material under an inert atmosphere, and then leaving the packages "under loose cover" or in the open for at least 24 hours before shipment. These processes are intended to stabilise the material, reducing the likelihood of it self-heating to ignition during shipment.

From a technical perspective, weathering in the open air allows the freshly made charcoal to cool and for active sites within the material to oxidise, and it also allows the moisture content of the charcoal to stabilise. In relation to cooling, Special Provision 978 stipulates that the material must be less than 40°C at the time of packing, so if this temperature is not achieved after it has been treated, the charcoal must be left to weather/cool for longer. Whilst not a requirement of the Code, a weathering report provided with the cargo would be a method of

demonstrating the foregoing requirements have been met and could be requested from the shipper by the carrier.

In respect of the arrangement of the stow inside shipping containers, there must be a headspace of 30cm in the container (*i.e.* an air gap of 30cm between the underside of the container roof and the top of the stow). Additionally, the stow must be arranged such that its height does not exceed 1.5m, or it can be arranged into "blocks" of packages not exceeding 16m³ by volume with air gaps of at least 15cm maintained between these blocks. These stowage requirements are illustrated in the figure below.



Figure 1 – Illustration showing our understanding of the stowage requirements of Special Provision 978.

Stowage in these manners effectively reduces the thermal mass of the stow and increases airflow around it for cooling, which should reduce the likelihood of the charcoal self-heating to ignition during transport. One way of demonstrating these stowage requirements have been satisfied is a vanning survey, which could be requested from the shipper, although there is no requirement in the Code for such a survey to be undertaken.

From review of the entry for UN 1361, the only other changes in Amendment 42-24 are the removal of Packing Provision PP12 (in connection with Packing Code P002) and the inclusion of Stowage Code SW27. The former affects the type of bags that can be used to carry the cargo (if bags are to be used), with only water-resistant types allowed². This is presumably to prevent the cargo being wetted after packing, which has been reported to influence self-

² Removal of PP12 means that bags with UN packaging codes 5H1 (woven plastic, without inner liner or coating), 5L1 (textile without inner liner or coating) and 5M1 (paper, multiwall) are no longer allowed.

heating. Stowage Code SW27 relates to carriage of the cargo in "loose packages" (on general cargo ships), rather than in containers. It provides recommended stowage instructions for the packages and imposes requirements for temperature monitoring of the cargo. It also provides instructions for how to respond if the temperature rises above a set level (55°C), indicative of self-heating.

There are no changes to the Stowage Category, which remains Category A – On Deck or Under Deck. However, as mentioned in our 2022 article, the Cargo Incident Notification System (CINS) recommends that containers carrying charcoal should be stowed on deck, in an accessible location. Similar advice has been reiterated in a more recent CINS guidance document³ that addresses the IMDG Code amendments discussed in this article. We consider this stowage guidance to be sensible advice that would allow containers to be monitored during the voyage and would allow better access for firefighting, if required. It should be kept in mind that charcoal has Stowage Code SW1, meaning it is necessary to protect containers from potential sources of heat, including precautions to reduce exposure to direct sunlight, which could heat the cargo and promote self-heating.

<u>Summary</u>

The recently adopted amendments to the IMDG Code in respect of charcoal will introduce stricter rules for its carriage. These appear designed to ensure that carriers are fully aware of the hazardous nature of the cargo and that the cargo has been packed and stowed in a manner intended to reduce the likelihood of it self-heating to ignition during transit. These new rules will no doubt have a positive effect and will become mandatory from 1 January 2026. They are currently in 'transitional' effect and can be adopted voluntarily.

It is almost inevitable, however, that fire incidents will still arise from time to time due to the self-heating property of charcoal and because, amongst other things, mis-declarations by shippers are unlikely to stop. Burgoynes has considerable expertise in investigating incidents

³ CINS document "Guidelines for the Safe Carriage of Charcoal in Containers", published September 2024.

involving charcoal, and indeed many other types of cargoes, and has provided technical advice for the management of live incidents on many occasions. We are also familiar with the IMDG Code requirements and their application for various types of cargo.

If you would like to obtain more details, or discuss potential instructions, then please contact one of our experts in your local Burgoynes office.

Dr Jim Mercurio, Partner – Dubai Office Office: +971 4 557 6174 | Mob: +971 50 867 4185 james.mercurio@burgoynes.com

Special Provision 978

- .1 For the purposes of this Code, carbon of animal or vegetable origin means carbon, generated in a production or manufacturing process, not formed in a geological process and not obtained from mining. Carbon covered by this entry is produced by pyrolysis of an organic material such as bone, bamboo, coconut shell, jute or wood.
- .2 The UN N.4 test according to section 33.4.6 of the UN *Manual of Tests and Criteria* shall not be used to exempt carbon of animal or vegetable origin (UN 1361) from the provisions of this Code.
- .3 Without testing, the material shall be assigned to at least packing group III.
- .4 Unless otherwise approved by the competent authority, the following provisions apply:
 - .1 after production, the unpacked material shall be subject to weathering (stored under cover, but in the open air) for a minimum period of 14 days before being packaged for transport; or
 - .2 after pyrolysis, steam and cooling shall be applied to the unpacked material and the material shall be packed under an inert gas atmosphere (e.g. nitrogen); packages shall then be stored under loose cover or in the open air for a minimum of 24 hours before transport.
- .5 The material shall be packed into packagings only when the temperature of the material does not exceed 40°C on the day of packaging.
- .6 When stowed in a cargo transport unit, minimum headspace in the CTU of 30 cm shall be maintained, and:
 - .1 the stowage height of the package(s) in the unit should not exceed 1.5 m; or
 - .2 the maximum block size of the packages should be 16 m³ and a minimum of 15 cm of space between blocks shall be maintained.