Guidelines for the Carriage of Charcoal and Carbon in Containers

A Joint Publication of CINS (the Cargo Incident Notification System) and the International Group of P&I Clubs

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INTRODUCTION

Background

These Guidelines (published jointly by CINS and the International Group of P&I Clubs) for the carriage of Charcoal and Carbon in containers have been prepared by a CINS Work Group.

It is estimated that global production of wood Charcoal and Carbon for domestic and export markets is about 53 million tonnes per year[1].

The practices set out in this document are intended to improve safety during the carriage of Charcoal and Carbon and to ensure that it is properly declared, packaged and carried.

Charcoal and Carbon shall be transported in compliance with the requirements set out in the International Maritime Dangerous Goods Code (IMDG Code)[2]. However, the practices set out below include selected provisions from the IMDG Code plus additional precautions to enhance its safe carriage.

CINS – Cargo Incident Notification System

CINS is a shipping line initiative, launched in September 2011, to improve safety in the supply chain, reduce the number of cargo incidents on-board ships and on land, and highlight the risks caused by certain cargoes and/or packing failures. Membership of CINS comprises over 80 percent of the world's container slot capacity, together with the 13 Members of the International Group of P&I Clubs.

CINS provides analysis of operational information on cargo and container incidents which lead to injury or loss of life, loss or serious damage of assets, environmental concerns. Data relating to any cargo incident on-board a ship is uploaded to the CINS database. The data includes information on cargo type, nature, packaging, weight; journey (load and discharge ports); type of incident and root cause.

International Group of P&I Clubs

The thirteen principal underwriting associations which comprise the International Group, between them provide liability cover (protection and indemnity) for approximately 90% of the world's ocean-going tonnage. Each Group Club is an independent, non-profit making mutual insurance association, providing cover for its shipowner and charterer members against third party liabilities relating to the use and operation of ships. Each Club is controlled by its members through a board of directors, or committee, elected from the membership.

Clubs cover a wide range of liabilities, including loss of life and personal injury to crew, passengers and others on board, cargo loss and damage, pollution by oil and other hazardous substances, wreck removal, collision and damage to property.

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- TT Club
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- Zim Line

[1] 2014 Global Forest Products Facts and Figures of the Food and Agriculture Organization of the United Nation

[2] This Code is mandatory and contains requirements for the safe carriage of packaged dangerous goods. It is published by the International Maritime Organization (IMO) and revised biennially. At the date of publishing these Guidelines, Amendment 37-14 to the Code is in force. Amendment 38-16 enters into force on 1 January 2018 and Governments are encouraged to apply this amendment in whole or in part on a voluntary basis.

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1. CARGO ISSUES

1.1. Hazardous Properties of Charcoal and Carbon

Charcoal / Carbon is a lightweight, black residue, consisting of Carbon and any remaining ash, obtained by removing water and other volatile constituents from animal and vegetation substances. Charcoal is usually produced by slow pyrolysis, which is the heating of wood or other organic substances in the absence of oxygen.

Charcoal / Carbon is a commodity liable to spontaneous combustion and is classified 4.2 (substances liable to spontaneous combustion) in the IMDG Code and other modal dangerous goods regulations.

The spontaneous combustion of Charcoal may cause a fire in a container. Charcoal / Carbon is considered to be a self-heating substance[3], which is a substance, other than pyrophoric substances, which, in contact with air without energy supply, is liable to self-heating. A self-heating reaction may result in extensive heat development and fire.

The most combustible matter in the Charcoal is Carbon, which when stored in an environment containing oxygen, slowly oxidizes to form carbon dioxide and carbon monoxide. This reaction produces heat and since Charcoal is a relatively good thermal insulator, it traps the heat, increasing both the temperature and rate of oxidation, which gives rise to self-ignition.

Such a process is further accelerated by wetting, which is an exothermic process, where heat is released. In some cases, Charcoal bags are stored in an open space before loading with inadequate protection from rain. The recommended vanning survey (See Section 4.3 of these Guidelines) should assess whether the packages have been wetted.

In addition, if only partially burned wood pieces are in the cargo these may give rise to the possibility of lower than required temperatures during carbonizing process, which will leave the charcoal in chemically unstable condition.

Further, it must be noted that the quality of the manufacturing process, packaging and quantity can have an impact on self-heating properties (See Section 4.1 of these Guidelines).

1.2. Charcoal / Carbon Categories

The dangerous goods classification of Charcoal / Carbon includes three categories; UN number 1361, UN number 1362 and UN number 3088. The associated entries in the IMDG Code are shown below.

IMDG Class	UN Number	Description
Class 4.2	UN 1361	CARBON animal or vegetable origin
Class 4.2	UN 1362	CARBON, ACTIVATED
Class 4.2	UN 3088	SELF-HEATING SOLID, N.O.S (technical name: Charcoal)

[3] The United Nations Manual of Tests and Criteria describes self-heating test methods for determining the properties of substances classified as self-heating. The tests to determine whether a commodity is liable to dangerous self-heating are being done with 25 mm or 100 mm sample cubes at temperatures of 100°C, 120°C or 140°C with a rise in temperature by 60°C within 24 hours.

1.3. Other Trade Names for Charcoal

Other trade names under which Charcoal / Carbon may be presented for shipment include, but are not limited to, those listed below.

- Bamboo charcoal
- Carbon briquettes
- Carbon of vegetable origin
- Carbon shell
- Coal vegetable packages
- Coconut shell
- Hardwood
- Magnesia carbon brick.

Charcoal is also used in tablet form for water-pipes used for smoking, including Nargila, Shisha or Hookah pipes. This type of charcoal may be manufactured with some flammable solid inside, resulting in lower ignition temperature.

2. CARBON NOT SUBJECT TO THE PROVISIONS OF THE IMDG CODE

The provisions of the IMDG Code do not apply to non-activated Carbon blacks of mineral origin and Carbons made by a steam activation process.

IMDG Code Special Provision 925, under Part 3, Chapter 3.3, of the Code states:

IMDG Code Special Provision	
925	The provisions of this Code do not apply to: - non-activated carbon blacks of mineral origin; - a consignment of carbon if it passes the tests for self-heating substances as reflected in the United Nations Manual of Tests and Criteria (see 33.3.1.3.3), and is accompanied by a certificate from a laboratory accredited by the competent authority, stating that the product to be loaded has been correctly sampled by trained staff from that laboratory and that the sample was correctly tested and has passed the test; and - carbons made by a steam activation process.

It is of the utmost importance that Charcoal / Carbon not subject to the provisions of the IMDG Code should be declared by the shipper to the receiving carrier.

To verify whether Charcoal / Carbon offered is subject to the provisions of the IMDG Code, it is of the utmost importance that the product presented to be loaded has been correctly sampled by trained staff from a laboratory accredited by the competent authority and has passed the self-heating test**.** The test certificate is to be provided by the shipper and is required to accompany the shipment.

Non-declaration of Charcoal / Carbon leads to unsafe stowage and dramatically increases the risk of fire, leading to potentially loss of life, assets and damage to the environment.

It is strongly recommended under these guidelines that Charcoal / Carbon not subject to the provisions of the IMDG Code (under IMDG Code Special Provision 925) should meet the requirements for container selection, packaging, stuffing, inspection, stowage and segregation set out in guidelines below for Charcoal / Carbon that is classified as dangerous goods.

3. CONTAINER SELECTION

The type of container and size selection should be based on the principle of maximum filling to reduce the free space in the container and thus reduce the air (oxygen) in the container (See Section 4.2 of these Guidelines).

Containers should also be in a good condition and clean.

4. CONTAINER PACKING

4.1. Packaging and Quantity

The IMDG Code defines what packaging can be used for Charcoal / Carbon classified as dangerous goods. This is currently set out in Part 4 of the IMDG Code, Chapters 4.1, for UN number 1361, UN number 1362 and UN number 3088.

The maximum quantity of Charcoal / Carbon per bag should not exceed 50 kg.

Packaging should be water resistant, in good condition and must not be torn.

4.2. Stuffing

It is recommended to fill the container to the maximum amount permitted in order to reduce the free space in the container and thus reduce the volume of air (oxygen). Air circulation should be reduced as much as possible.

The cargo should be properly stowed and secured. However, packing should take account of the weight of the bags so as not to cause those at the bottom to be crushed or to split.

The temperature of cargo prior to stuffing should not be more than 5°C above the ambient temperature.

4.3. Inspection of Containers Prior to Carriage

It is recommended that, prior to carriage, carriers satisfy themselves that the cargo has been packed and secured with a method that allows safe transportation, for example, by means of a photo story or container inspection.

A vanning survey should confirm that:

- Cargo is packed and secured in a proper manner.
- Packaging is water resistant, in good condition and not torn.
- The temperature of the cargo when loaded is not more than 5°C above the ambient temperature.
- The packaging and interior atmosphere is clean and odourless, with no presence of fumes or smoke.

When a shippers' weathering report is requested, this report should include the following:

- A description of the whole cooling process and the chemical (or steam) used for activating.
- Verification that there has been a minimum of 14 days of pre-cooling prior to packaging.

5. SHIP LOADING

5.1. Container Stowage and Segregation

Charcoal / Carbon shall be transported in compliance with the stowage and segregation requirements set out in the IMDG Code.

Stowage Code	
SW 1	Protected from sources of heat
H2	Keep as cool as reasonably practicable

However, stowage ON DECK and ACCESSIBLE is strongly recommended under these guidelines.

6. DOCUMENTATION

6.1. Charcoal / Carbon Classified as Dangerous Goods

Charcoal / Carbon classified as dangerous goods must be declared and accompanied by the documents required by the IMDG Code.

6.2. Non-regulated Charcoal / Carbon

One of the main concerns is that if Charcoal / Carbon is not declared, the ship's crew will not be aware that such cargo is on board.

Charcoal / Carbon shipped under UN number 1361 or UN number 3088 is subject to the provisions of the IMDG Code unless a self-heating certificate (as specified under IMDG Code Special Provision 925) for the consignment has been presented to the shipping line by the shipper (see Section 2 of these Guidelines).

Therefore, it is of the utmost importance that Charcoal / Carbon not subject to the provisions of the IMDG Code (under IMDG Code Special Provision 925) is declared as special cargo to the shipping line and has a self-heating test certificate as required, which is accepted by the shipping line. The self-heating test certificate for the consignment is required to accompany the shipment and it is recommended that the certificate should be valid for a period of no more than 6 months.

This enables the shipping line to arrange proper stowage on board the vessel and inform the master accordingly.

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