Guidelines for the Carriage of Cocoa Butter in Freight Containers

A Publication of CINS (the Cargo Incident Notification System)

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INTRODUCTION

Background

These Guidelines for the carriage of cocoa butter in freight containers have been prepared by a working group comprising Members of CINS Organisation (the Cargo Incident Notification System). The guidance provided seeks to apply the principles set out in the IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units (CTU Code)[1].

CINS – Cargo Incident Notification System

CINS is a shipping line initiative, launched in September 2011, to increase 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 about 80 percent of the world's container slot capacity.

CINS permits analysis of operational information on all cargo and container incidents which lead to injury or loss of life, loss or serious damage of assets and environmental concerns. Data relating to any cargo incident on-board a ship, in terminals etc. 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.

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[1] http://www.imo.org/en/OurWork/Safety/Cargoes/CargoSecuring/Pages/CTU-Code.aspx

Guidelines for the Carriage of Cocoa Butter in Containers

1. CARGO NATURE

Cocoa butter is derived from whole cocoa beans which are fermented, roasted, and then separated from their hulls. About 54–58% of the residue is cocoa butter. It contains various amounts of saturated fats (57-64%) and unsaturated fats (43-36%).[2]

Cocoa butter becomes soft and malleable at 30-32°C and can melt at 37°C. Having become warm or molten, it can retain the latent heat and remain in such a condition down to as low as 17°C.

Upon heating, cocoa butter expands and may cause it to burst the packaging and seep out, staining adjacent cartons and possibly leaking outside of the container or causing damage to the container structure. There have been incidences of cocoa butter melting on board ships, resulting in the clogging of ships' bilges.

2. FREIGHT CONTAINER SELECTION

2.1. General

The majority of cocoa butter is exported from equatorial and tropical countries, and transported along routes that are close to or cross the equator. Therefore, it can be expected that the container will experience long periods of high ambient temperatures.

Studies have shown that the air temperature inside the container can be substantially higher than the ambient temperature outside the container. During a sunny day, the temperature can in fact easily reach 20°C above the ambient temperature, i.e. sometimes more than 50°C[3].

2.2. Standard Freight Containers

Cocoa butter is usually shipped in standard dry freight containers. This is possible where the expected ambient temperatures during the intended transportation are taken into consideration when planning the packaging and the packing of the container.

2.3. Reefer Containers

Particularly when transporting through hot climate zones it is recommended that cocoa butter is shipped in reefer containers as it ensures a stable cargo quality throughout the whole transport chain.

It should also be noted that this cargo may be carried in non-operating reefer containers[4], since the insulation may provide sufficient reduction in thermal transfer. Long exposure to sun light may however still permit some heat transfer, resulting in the outermost cartons softening.

Where it is decided to utilise operating reefers, this will successfully limit the heat transfer to the outermost cartons cargo, so long as an air gap is appropriately maintained around the cargo.

2.4. Tank Containers

[2] Wikipedia
[3] See http://www.containerhandbuch.de/chb_e/scha/index.html
[4] See http://www.cinsnet.com/wp-content/uploads/2016/01/COA_CINS-NOR-Guidelines-1-August-2017.pdf

Under special circumstances tank containers are used for cocoa butter. No special precaution is required when using a tank container.

3. FREIGHT CONTAINER PACKING

3.1. Packaging and Quantity

Cocoa butter is to be properly packaged in sealed plastic bags placed into cardboard boxes (cartons). When shipped, particularly in dry containers, it is important to make sure that the cartons' design is suitable to support the entire stacked mass even when the cocoa butter is softened due to elevated temperatures. Stack heights should not exceed the strength characteristics of the bottom-most carton.

The provision of some form of protection to the cargo from radiant heat should be considered if reefer containers are not used.

As noted in section 2.3, reefer containers will provide protection from radiant heat. Where the refrigeration machinery is operating, it is important that the cartons are packed to allow appropriate air circulation[5].

More rarely, cocoa butter is pumped into a flexitank for carriage. In case this option is chosen it is recommended that COA code of practice for use of Flexitanks is followed in particular where choice of Flexitank and compatibility with commodity is concerned. Such combination is always subject to Carrier acceptance.

4. TRANSPORT

4.1. Terminal Operations

Terminals rarely offer shaded storage for containers. Dry containers carrying this cargo should be packed and transported to the load port terminal as late as practically possible to minimise the exposure time to sun/heat before being loaded on board the ship.

An additional risk factor to be considered by cargo packers is the time in transhipment hubs where containers are exposed to various weather conditions. The entire routeing of the container should be considered in determining appropriate actions to take in reducing the risks.

4.2. Vessel Operations and Stowage

Shipping lines will usually expect that the cargo has been packed in the most appropriate manner for the intended carriage and will not warrant any specific stowage position on board of the ship. Stowage on deck is recommended to allow easy monitoring and cleaning in the event of a spillage.

All parties involved in the transport chain must be notified about the contents of the containers to ensure correct stowage and that inspections for possible leakages can be performed.

[5] See CTU Code, Informative Material 8 "Transport of Perishable Cargo" (http://www.imo.org/en/OurWork/Safety/Cargoes/CargoSecuring/Documents/1498.pdf)

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