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Sugar cargoes, not as sweet as they seem?

Back in the day, sugar was referred to as “white gold”. It was the engine of the horrific slave trade, and at the same time the profit from the sugar trade brought a lot of wealth to the Americas in the 17th century and is even said to have contributed to America’s independence from Great Britain. Today, sugar remains a very valuable commodity, especially for the food industry. But let’s not sugar-coat the reality, because in shipping what at first looks like a harmless cargo, can nevertheless result in costly claims.

Recently MS Amlin has seen an increasing number of shortage claims and quality disputes related to the carriage of sugar cargoes. With this circular, we would like to promote further awareness of the risks associated with the loading, carriage and discharge of sugar cargoes, as well as provide some loss prevention recommendations.

What is sugar?

Sugar is found in the tissues of most plants. However, only sugarcanes and sugar beets have sufficient sugar concentration for extraction. The sap is extracted and condensed into syrup, which is then crystalised and purified.

In the past, white sugar was predominantly transported as break-bulk cargo in bags of woven natural materials (e.g. jute). However, nowadays it is mainly carried in woven plastic bags with a plastic inner bag (polyethylene or high-density polyethylene) which is impermeable to water vapour and provides protection from contamination.

- ***Sugarcane*** *is a giant grass and grows mostly in tropical climates.*
- ***Sugar beet*** *is a root crop and is cultivated in cooler climates.*

Sugarcane

Sugar beet

The most important quality feature of sugar is its purity. Sugar is highly sensitive to contamination and moisture. Any dirt contaminating the sugar can cause health hazards, resulting in serious claims due to food safety legislation. It is therefore of utmost importance that the cargo is stored and carried at the appropriate temperature and under suitable moisture/humidity conditions.

Today the largest exporting countries are Brazil, Thailand, the EU, Australia and India. On the other hand, the world’s largest importing nations in 2018 were Indonesia, China, and the United States.

Marking of packages

Keep dry

Use no hooks

What are the risks?

The main risk factors for sugar are:

- ***Temperature***

Sugar is sensitive to temperature and therefore temperature variations should be avoided. The maximum temperature to carry sugar should not exceed 25°C, as caking can occur due to the release of water. As such, the cargo should not be stowed near sources of heat.

- ***Ventilation***

To reduce the risk of mould, unrefined sugar in bulk needs surface ventilation. Moisture and relativity values inside and outside the cargo hold need to be monitored to avoid condensation. If the sugar is packed in bags with a plastic lining, ventilation is not required.

- ***Gases***

Sugar in which alcoholic fermentation is underway may result in the creation of CO2. This can be so severe that the CO2 concentrations inside the cargo holds or containers could become life-threatening. Therefore, the holds must be ventilated, and a gas measurement must be carried out before a person enters the space. See also our circular about enclosed spaces.

- ***Self-heating / spontaneous combustion***

Smoking is absolutely prohibited in cargo holds and containers as unextinguished cigarette ends may ignite the sugar and cause fires, as ash acts as a catalyst in combustion. Sugar fires are particularly dangerous as they are difficult to extinguish.

- ***Odour***

Sugar is extremely sensitive to any foreign odours and should therefore not be stored together with odour-emitting products.

- ***Humidity / moisture***

Refined sugar is normally a dry, free-flowing commodity with very low moisture content. Sugar can ferment in the presence of moisture and, therefore, for longer voyages only matured sugar with a water content < 0.05%, or < 0.03% should be loaded. If the sugar is found on delivery not to be free flowing, it is important to establish whether this is due to:

1) Pressure compacting - it usually occurs as a result of static pressure exerted by the weight of the sugar itself, especially when bags are stacked high. This condition can readily be corrected when the bags are handled and moved around. However, stickiness and caking of refined sugar are both the result of too high a moisture content and possibly to some extent, the temperature of the cargo at the time of bagging.
2) Stickiness - it occurs as a result of high moisture content, either initially or after packing.
3) Caking - it may occur when over-moist sugar dries out.

- ***Contamination***

Sugar is extremely sensitive to contamination of any kind. Cargo holds and containers must be kept clean and in a thoroughly hygienic condition.

- ***Mechanical influences***

Point loads applied, for example, by hooks may result in damage (tears) to the bags and in turn loss of volume. For that reason, plate or bag hooks, which distribute the load and reduce the risk of damage, should be used.

- ***Shortage***

Weight loss due to the release of water vapour is not likely to occur. However, incorrect handling of bagged product often results in trickle losses. An approved surveyor should be appointed to tally the bags or perform a draft survey in both the loading and discharging port.

- ***Insect infestation / disease***

When exposed to moisture, sugar is susceptible to mould growth and fermentation by moulds and yeasts. It may also suffer damage as a result of infestation by rats, mice, ants, flies and silverfish.

Recommendations for transportation of sugar in bags:

To minimise risks, we recommend the following precautionary measures:

Loading:

- ✓ The ship's holds should be clean, dry and free from any noticeable smell.
- ✓ Bags should be loaded only if outwardly dry with no apparent lumpiness of the contents.
- ✓ No bags should be loaded during any form of precipitation, including rain or snow.
- ✓ Cargo battens are not essential. Where no battens are fitted, measures should be taken to prevent damage from any protruding cargo batten hooks or fittings.
- ✓ Ensure the separation of polyethylene or polypropylene cloth or paper sheeting between the ship's structure and the bags is sufficient.
- ✓ Tight block-stowage is the customary and acceptable method of stowage.
- ✓ If additional cargo is to be carried in the same hold as refined sugar, then this should be 'dry' cargo.

Discharge:

- ✓ The rapid discharge of any bags which may have been loaded at substantially lower temperatures than at the discharge port is necessary. This will help to prevent unwanted condensation on the bags during discharge.
- ✓ Discharging slings of bagged cargo should not be dragged out from wings or ends of holds as this will result in bags tearing on plate butts and landings, rough wooden tank top ceilings, or other obstructions.
- ✓ The total quantity and quality of cargo should be guaranteed as agreed prior to shipment. Facilities should be available for re-bagging of spilt cargo bags both during loading and discharging.
- ✓ All torn, slack or empty bags and packages should be carefully inspected while discharging is in progress, and they should be delivered (against tally) along with the sound cargo, otherwise a claim for short delivery is likely to follow.

This circular is meant for guidance purposes only. Should you require more information or assistance, please feel free to contact our Client Services Desk: **ClientServicesDesk@msamlin.com**

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