

RISK ALERT



Risk Issues in Respect of Soybean Cargoes



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The global trade in soybeans is dominated by three countries. Brazil and the USA account for around 80% of total exports, and almost 60% soybean imports are destined for China. Features of this trade associated with the countries of production, pre-shipment transport and long voyages through various climate zones provide ample potential for the condition of cargoes to deteriorate with consequent expensive claims exposure.

The period of safe storage for soybeans before deterioration occurs varies according to the temperature of the beans and moisture content and can shorten dramatically as both of these measures increase. The Club has received reports of increasing problems with soybean cargoes due to the increased moisture content.

Soybean is a sensitive cargo and prone to deterioration and self-heating whenever its moisture content (MC) and temperature rise above the limits within which the seed is biologically stable.

The soybean cargo condition can deteriorate during transit due to many factors such as:

- Ingress of water – In this respect the weather tightness of cargo hold hatch covers is of paramount importance. It is recommended that an ultrasonic test (UST) is carried out on the hatch covers and associated parts to ensure that the sealing arrangement is effective and properly maintained. The hatch covers must be weathertight as any water ingress will damage the soybean cargo resulting in caked cargo or burned cargo as the result of self-heating caused by the increase in MC.

- Inherent vice of the cargo - like any other agricultural product, the soybean cargo itself respire and during this metabolic process gives off heat. This in turn increases the cargo temperature which leads to microbiological reactions and mould growth, thus resulting in progressive deterioration of the cargo's condition. If the cargo has not been treated and stored properly ashore and is loaded with a high moisture content, this might then lead to self-heating during the carriage onboard the vessel. The self-heating can affect a large amount of cargo and in some cases the whole cargo can be damaged.

A factor that contributes to this is that the soybean fields are at times far away from the ports and it might take days, by road or barge, for the cargo to arrive at the ports. If not protected properly during transit it can be exposed to the weather which then affects the seed quality, for example by increasing the moisture content.

- Once loaded, the cargo is susceptible to damage by having its temperature raised through contact with hot surfaces such as the engine room bulkhead, heated double bottom and topside fuel tanks. Such damage is usually restricted to the cargo layer in contact with the hot surface and necessitates the damaged cargo being collected and segregated from sound cargo during discharge operations. Even in such instances of isolated areas of damage, the level of claim can be significant, particularly when taking into account, in addition to the value of the cargo loss, the logistics of segregation and the disposal of the damaged cargo.

Moisture Content (MC) of the cargo - a cargo moisture content (MC) of around 14% is considered safe for transportation (as per ANEC 41 dated 01 July 2020 - <https://www.anec.com.br/uploads/ckion1kw600015stx7q3oezlc.pdf>), however, if the cargo itself was not harvested, treated and stored

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properly ashore then, even with the greatest attention to onboard care of the cargo, there is a possibility that the cargo will suffer damage over the duration of a long voyage. The passage from South America (e.g. Brazil) to the Far East (e.g. China) takes about 40-45 days; a long voyage. If any transit delays and delays waiting to berth are experienced, this can result in cargo deterioration. Warm moist air rising from the cargo may result in mouldy cargo developing at the surface, or it may lead to ship's sweat which may in turn fall back onto the cargo as droplets, thus leading to cargo damage at the surface.

Moisture content and temperature of the cargo also have an important relevance to the period of time for which the cargo can be safely stored. As moisture content and temperature increase the safe storage period reduces quite dramatically. This is an important factor when vessels are subject to berthing delays.



- Improper ventilation during passage – soybean cargo on a vessel loaded in Brazil en-route to China will be at risk of exposure to ship's sweat. The cargo will have been loaded in warm and humid conditions and ship's sweat is formed when the steel hull and structures of the vessel cool due to the colder ambient sea and air temperature as the voyage progresses. If hold ventilation is not properly managed, condensation can form on the inside of the steel structures as the moist warm air from the cargo comes into contact with the cool steel. This condensation will then drip onto the cargo surface causing damage.

- Cargo damaged in this manner can be collected and separated from the sound cargo during discharge operations and is not usually a very significant amount. Further information on sweat (ship's sweat & cargo sweat) can be found in the Risk Alert at the link below:

<https://www.steamshipmutual.com/Risk-Alerts/RA06ProblemofSweat.pdf>

Members are recommended to engage a third party surveyor at the load port to assist the master in loading soybean cargo. The surveyor will also assist in checking the temperature/moisture content of the cargo prior to and during the loading operations and will also assist the master in the event that any clausing of the bills of lading is needed concerning the condition of the cargo.

The following are also important in mitigating potential cargo claims:

- The master is to be provided with the quality certificate for the cargo at the load port
- The master should record the weather conditions at the time of cargo loading
- Cargo temperature and moisture content is to be frequently checked during loading operations and an independent surveyor can assist with this
- Cargo should not be loaded during precipitation and crew should be vigilant in monitoring weather conditions such that cargo hold hatch covers can be closed prior to any precipitation.
- The conveyor belt is to be checked for any water at the start of the cargo operations
- Ventilation of the cargo holds. Ventilation cannot prevent self-heating which is a pre-loading issue, however, it can prevent or reduce "sweat" while the vessel is at sea. All cargo hold ventilation activities are to be properly logged and filed onboard
- Record the daily temperature of the cargo whilst on passage
- Detailed deck log book entries recording weather conditions for the entire voyage are to be maintained

- Ensure that the cargo is fumigated properly at the load port before departure by a qualified person and that the instructions for achieving effective fumigation are strictly adhered to in order to have the desired effect. (Reminder that all appropriate safety precautions are to be taken when fumigating to ensure the safety of personnel)
- The cargo holds are to be sealed on cargo completion in the presence of an independent surveyor and again, seals are only to be broken at the discharge port in the presence of all interested parties, except where it has been agreed that the seals can be broken at sea in order to comply with the fumigation requirements
- It is also good practice to take samples of the loaded cargo and keep them onboard in airtight sealed containers. These samples might be useful in defending future claims related to cargo damage.

For further information if required please contact the Loss Prevention Department of the Club.