

Flexible Intermediate Bulk Containers (FIBCs) and Dry Chemicals



We are also seeing claims brought about by different bagged chemicals being stowed together in the same hold on bulk carriers.

'Jumbo Bags with Jumbo Claims'

We continue to see a high number of incidents and claims from bagged cargoes being stowed in the same compartments as break bulk and steel cargoes. We are also seeing claims brought about by different bagged chemicals being stowed together in the same hold on bulk carriers.

The claims include Flexible Intermediate Bulk Containers (FIBCs) commonly referred to as 'bulk bags', 'jumbo bags' or just 'big bags' that have been damaged such as ripped, torn or collapsed due to other factors including:

- *Not being stowed and secured in accordance with IMO Rules and guidance and good seamanship practice*
- *Poor handling during the loading and discharging*
- *Poorly constructed FIBCs*
- *FIBCs failing for being utilised outside their intended design such as exceeding stowed tier height*

What are FIBCs?

FIBCs have a body of a flexible woven material (typically polypropylene) and is intended to ship solid material in powder, flake or granular form. It is designed to be handled from the top by permanently attached lifting loops/ slings which can be lifted by cranes, hoists or forklifts. They are frequently used to ship foodstuffs, agricultural product chemicals such as fertilisers, and pharmaceuticals.

FIBCs are manufactured to international standard such as EN ISO 21898 Packaging – Flexible Intermediate bulk containers for non-dangerous goods. The FIBC should have a label or printed on the material markings such as:

- *Safe Working Load (SWL)*
- *Date of production*
- *Number of certificates of construction and the date of issuance for the certificate*
- *Type of FIBC, such as heavy duty or standard*

FIBCs can be used to transport hazardous materials and/or dangerous goods if presented in an approved package for your particular products and it complies with the applicable regulatory code such as the International Maritime Dangerous Goods (IMDG) Code.

Statutory Regulations and Industry Practice

SOLAS (the International Convention for the Safety of Life at Sea)

SOLAS Chapter VI Regulation 5 (1) states that "Cargo, cargo units* and cargo transport units** carried on or under deck shall be so loaded, stowed and secured as to prevent as far as is practicable, throughout the voyage, damage or hazard to the ship and the persons onboard, and loss of cargo overboard."

SOLAS Chapter VI Regulation VI/5 and VII/5 require that cargo units and cargo transport units, including containers, be loaded, stowed and secured throughout the voyage in accordance with a Cargo Securing Manual (CSM) approved by the Authority (usually the Classification Society on behalf of the Flag State Administration) and drawn up to a standard at least equivalent to the guidelines developed by the IMO.

- *The provision of a Cargo Securing Manual (CSM) onboard the vessel is mandatory.*
- *When producing a ship-specific CSM, shipping companies need to incorporate the guidance and information provided in the CSS Code and any other Code.*
- *Any deviation from the CSM would usually require approval from Class and an amendment to the CSM issued.*

Code of Safe Practice for Cargo Stowage and Securing (CSS) Code

The CSS Code deals with the safe stowage and securing of cargoes and is best practice, but the relevant sections are usually included in the vessel's approved CSM.

- *Annex 10 of CSS Code deals with FIBCs, advising that vessels with wide hatches with compartments that are regular in shape and free of obstructions are best suited for stowage.*
- *FIBCs should be stowed as close as possible and any void space between FIBCs should be chocked off. Measures should be taken to prevent the FIBCs shifting to the open space in the wings and that chocking off is necessary in all cases to prevent shifting.*
- *In the case of a tween deck or lower hold being used for stowage of FIBCs, sufficient gratings or plywood sheets should be placed against the FIBCs and the use of wire lashings to secure the cargo.*

International Maritime Dangerous Goods (IMDG) Code

In instances when bagged cargoes are loaded into the holds of bulk carriers, these bagged cargoes are not subject to the International Maritime Solid Bulk Cargo (IMSBC) Code as this Code does not apply to bagged cargoes.

All dangerous goods in packaged form should be packed, loaded, stowed and transported in accordance with the IMDG Code. Chapter 4.1 deals with Use of Packaging, including Intermediate Bulk Containers (IBCs) which includes FIBCs.



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Potential Incidents with FIBCs

Torn bags and spillages

When handling bagged cargoes, it is common for at least some of the bags to tear and incidental spillages to occur during loading or discharge. In the case of spillages of bagged chemicals onto the exterior packaging of other consignments in the same hold (which may or may not also be chemicals), this may result in delays, refusal by stevedores to handle externally contaminated packages and/or rejection of such externally contaminated packages, even where there has not been direct contact or chemical reaction between incompatible chemicals.

Spillages involving environmentally hazardous substances (EHS) may result in fines or discharge being suspended.

Reactions of mixed chemicals in FIBCs within the same hold

We have seen an increase in the number of incidents related to bagged cargoes of different substances that are loaded into bulk carriers.

Potentially more serious incidents involve a reaction between some of these bagged chemicals which can occur due to spillages, tears in the bags, etc. In some cases, these reactions have resulted in fires onboard which destroyed large portions of the cargo within the hold. Following firefighting, the entire contents within the hold may not be salvageable, leading to large claims.

Because of the likelihood of spillages, there are risks associated with loading different FIBCs of chemicals. Extra caution should be taken to check for any potential incompatibilities between the cargoes to be loaded, and this may require an evaluation from a chemist. Checks should be undertaken to check the package integrity to minimise the likelihood of a spillage or tearing of the FIBCs. It is also important to ensure that the correct FIBC is used for the chemical.

Summary

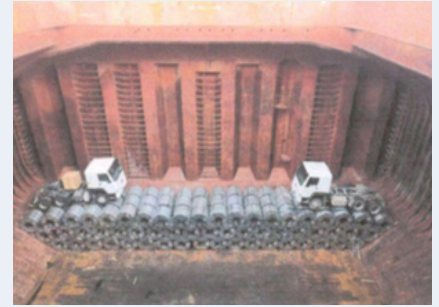
All cargo is to be loaded, stowed and secured in accordance with IMO regulations, including SOLAS, the CSM, the CSS Code and the IMDG Code.

Irrespective of Charterers' instructions to load cargo, the Master is obliged to ensure the safety of the vessel, crew and cargo. If the intended load may jeopardise the safety of the vessel, then under Chapter V, Regulation 34-1 of SOLAS, the Master has the authority to take any action deemed necessary to ensure the safety of the vessel.

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Case Study

The loading commenced and during the loading the Master issued a Letter of Protest (LOP), concerning vehicles stowed on steel coils shown below. Despite the LOP, loading continued.



A five-hold geared bulk carrier loaded mixed stowage of bagged cargo, vehicles and steel products at China for offloading at Africa and Brazil. The Charterers' Pre-Stowage Plan had indicated to the Master that bagged cargo, vehicles and steel bars were planned to be loaded above steel coils. The Master did not raise any protest at this pre-stowage phase.

Further into the cargo operation, the Master issued a further LOP. This concerned the construction of a wooden structure on the tank top around the steel coils with steel products and Monoammonium Phosphate (MAP) stowed on the wooden structure and above the steel coils, shown below. The Master protested that there was a risk that the wooden structure could collapse, along with crushing of the steel coils, and a potential shifting risk. The Master raised that the MAP could contaminate the finished steel cargo.



The loading progressed despite the Master's concerns with vehicles loaded atop the bagged cargoes, shown below.

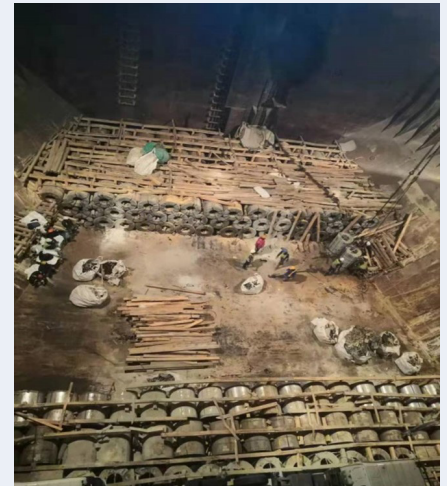


CASE STUDY CONTINUED

During discharge, several bags were found to have been crushed and spilled the contents of MAP within the hold including onto the steel cargo.

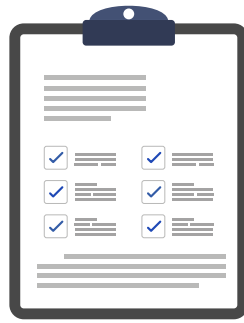


The vessel departed and the passage to the first discharge port was uneventful. During discharge, several bags were found to have been crushed and spilled the contents of MAP within the hold including onto the steel cargo – shown opposite.



When the vessel arrived at the final discharge port, a considerable number of the coil outer packaging were found to have been affected by MAP spilled from the bagged cargo stowed above, and discharge at the previous port – as shown below. A large cargo claim was brought against the Owners.





Lessons learned

When carrying bagged cargo there will be an expectation that there may be some spillage and a number of bags may split. If it is the same cargo throughout the compartment, the product can usually be swept up at the end of discharge and there is generally no problem.

The issue with this case is that the bagged cargo was stowed directly atop of steel coils and the spilled fertiliser came into contact with the steel coils below. Not only was this not in accordance with good seamanship, it was not in accordance with the vessel's CSM.

The vessel's approved CSM only allowed for coils to be stowed to two tiers high but the stowage arrangement at the subject time was three tiers high.

Not only did the stowage arrangement go to three coils high, but there was also a timber frame structure imparting additional point loads on the tank top with further steel products, bagged cargo and vehicles stowed on top. According to the stowage plan, over 3000 tonnes of cargo stowed atop the steel coils and timber frame in one hold. There was a significant risk that the timber frame could collapse causing damage to the vessel and cargo.

It is well documented that steel coils are not homogeneous cargoes in the same manner as bulk cargoes when it comes to tank top strength. There was a significant risk of overloading the tank top.

The stowage arrangement onboard would not have allowed for a proper and appropriate ventilation regime of the steel coils stowed below plastic sheeting and bagged cargoes.

The stowage and securing were not in accordance with the CSM, CSS Code and, by association, was not stowed in accordance with the requirements of SOLAS.

The Master, quite correctly, issued several LOPs at the load port raising concerns that there was an increased risk that the bagged cargo would contaminate the steel coils and that there was potential for crushing damage. However, the Master/Owners allowed for the loading to progress and to leave the berth with such a poor stowage and securing arrangement.

The Master should have alerted the P&I Club at an earlier stage during the loading so that assistance could be sought from experts. The proposed loading plan could then have been revised so that the cargo is stowed in accordance with the CSM, CSS Code and best practice and therefore reducing the risk of potential claims.

Recommendations and good practice for stowing and securing FIBCs with other break bulk cargoes

- Ensure cargo is loading in accordance with IMO statutory requirement, the vessel's CSM, CSS Code, IMDG Code, and industry best practice.
- The Shipper should provide in advance of loading sufficient details of the cargo so that proper planning can be undertaken. If not provided, ask for details of the bagged cargoes.
- Liaise closely with the Port Captain at the planning stage.
- Ensure FIBCs are not stowed outside the recommended tier height/tier rating.
- Closely monitor cargo handling during load and discharge. Ensure FIBCs are loaded with care to avoid damage.
- Beware of the potential problems of stowing bagged chemicals with other break bulk and steel cargoes.
- Consider the tank-top strength with loading cargoes, particularly steel coils as they are not homogeneous cargoes.
- Take photographs throughout cargo operations and keep accurate records.
- If there are problems during loading and/or discharge, consider issuing a LOP.
- Contact your P&I Club at an early stage so that expert advice can be sought in relation to the proposed/actual loading.
- Before any entry into holds, be aware of toxic gas potential. Ensure gas readings are carried out and holds are adequately ventilated.
- Always seek advice regarding chemicals following a spill.

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