WorkSafe BC

WorkSafe Bulletin

Flexible intermediate bulk containers: Are they the right tools for the job in construction?

Flexible intermediate bulk containers (FIBCs) are large, industrial fabric bags developed to store and transport bulk materials such as powders, granulars (small particles or grains), and pastes. However, FIBCs are being used on construction sites to move rebar, construction debris, hardened shotcrete, and other sharp or pointed items. Moving FIBCs filled with these items above construction sites could result in fatalities if the bags fail. This bulletin discusses the hazard and how to manage the risk.

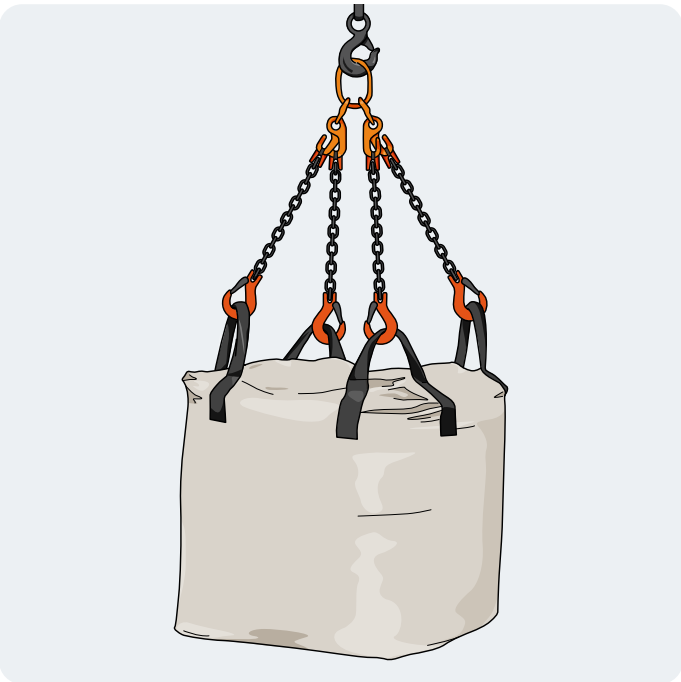
About FIBCs

FIBCs, also called bulk bags in industry, are usually made from woven strands of polypropylene. Over the years, the convenience, adaptability, and affordability of FIBCs have led many industries to use them to move items other than bulk materials, including sharp items. However, FIBCs should not be used for lifting sharp items unless the FIBCs' instructions or labels state it is safe to do so.

What is the hazard?

FIBCs are being used, and reused, on construction sites to move items they may not have been designed to transport safely. Rebar, construction debris, hardened shotcrete, and other sharp or pointed items can damage FIBCs, resulting in catastrophic failures.

As FIBCs have become more commonly used, there have been multiple failures and near misses on construction sites. In one incident, a tower crane was lifting an FIBC containing leftover hardened shotcrete weighing more than 900 kg (about 2,000 lb.). The FIBC fell more than 18 m (about 60 ft.) and landed near a worker below. The worker was not injured. At the time of the incident, the FIBC was within its working load limit.



A loaded FIBC is shown suspended from a crane. An FIBC should not be used for lifting sharp items unless its instructions or labels state it is safe to do so.

How to manage the risk

Employers

- Ask yourself whether FIBCs used on their own are the right tools for the job. Identify the hazards (e.g., sharp items in loads), assess the risks, and consider using safer alternatives. For example, some employers use engineered boxes or manufactured containers to carry loaded FIBCs. The FIBCs are filled with materials and placed into a box. The box is then moved around the construction site by a crane. These boxes are made of robust materials and are much less likely to fail when carrying sharp items than FIBCs used on their own.
- If you plan to use FIBCs on their own to move materials, review the supplier's or manufacturer's instructions to ensure they provide the necessary information to use the FIBCs safely. If they don't, replace them with adequate instructions from a professional engineer.
- Confirm that your procedures, systems, and actual use of FIBCs align with the supplier's, manufacturer's, or engineer's instructions and the FIBCs' labelling, particularly with respect to the following:
  - The types of materials the bags can and cannot be used to lift
  - How the bags are to be rigged
  - The fill and weight capacity of the bags
  - The need to fill the bags evenly
  - How and when the bags are to be inspected
  - The maximum number of uses of the bags
  - Criteria for rejecting use or reuse of bags
  - Where bags are stored and their storage life (which exposure to sunlight shortens)
- Ensure riggers and crane operators are qualified, and that they are familiar with and follow the hoisting requirements for FIBCs.
- Ensure workers are trained to distinguish between single-use and reusable FIBCs.
- Ensure your safe-use procedures are effective.

Suppliers and manufacturers

- Establish the safe working load and safety factor for the FIBC using testing and/or engineering analysis based on rational principles like those in the ISO 21898 standard for FIBCs.
- Provide instructions for safe use of the bags, particularly with respect to:
  - The types of materials the bags can and cannot be used to lift
  - How the bags are to be rigged
  - The fill and weight capacity of the bags
  - The need to fill the bags evenly
  - How and when the bags are to be inspected
  - The maximum number of uses of the bags
  - Criteria for rejecting use or reuse of bags
  - Where bags are stored and their storage life (which exposure to sunlight shortens)
- Ensure adequate labelling of bags. Best practice is to include the labelling information listed in ISO 21898.

Regulatory and legal requirements

OHS Regulation

- Section 4.3(1) and (2), Safe machinery and equipment
- Section 4.8, Rated capacity
- Section 15.2, Qualified riggers

Workers Compensation Act

- Section 21, General duties of employers
- Section 26, General duties of suppliers

For more information

WorkSafeBC's Managing risk webpage has more information on reducing the risk of injury.