

Dunnage Bag In Cargo Load Securing

Cejipac Sdn. Bhd.

Why secure the cargo loads?

- The sea can be rough!



Why secure the cargo loads?

- The goods can fall out !



Why secure cargo loads?

- Damaged goods and properties can be expensive!



Why secure the cargo loads?

- Can cause accident!



Why secure cargo loads?

- Can damage the container!



Why secure the cargo loads?

- Can cause public nuisance!



Common excuses given

- “It’s so heavy, it won’t shift”
- “We thought it will be strong enough”
- “We have no time to secure the cargo during loading”
- “We have been doing this for 20 years and nothing like this has ever happened before”

Introduction

- What is a dunnage bag?

It is a bag filled with air and used to restrain loads in rail cars, trucks and containers. It is also used to fill voids between articles of cargo to prevent shifting during transit.

Construction

- A polyethylene bladder with a polyethylene valve
- To give strength , the bladder is wrapped in one or multiple ply of kraft paper, vinyl , nylon or woven polyethylene sheet.

Purpose

- To fill voids , brace loads, restrain loads, absorb vibration and cushion the loads from in-transit damage.



How does it work?

- Adapt to any shape, space or void
- Absorb vibration
- Exert constant pressure
- Cushion



Working Pressure

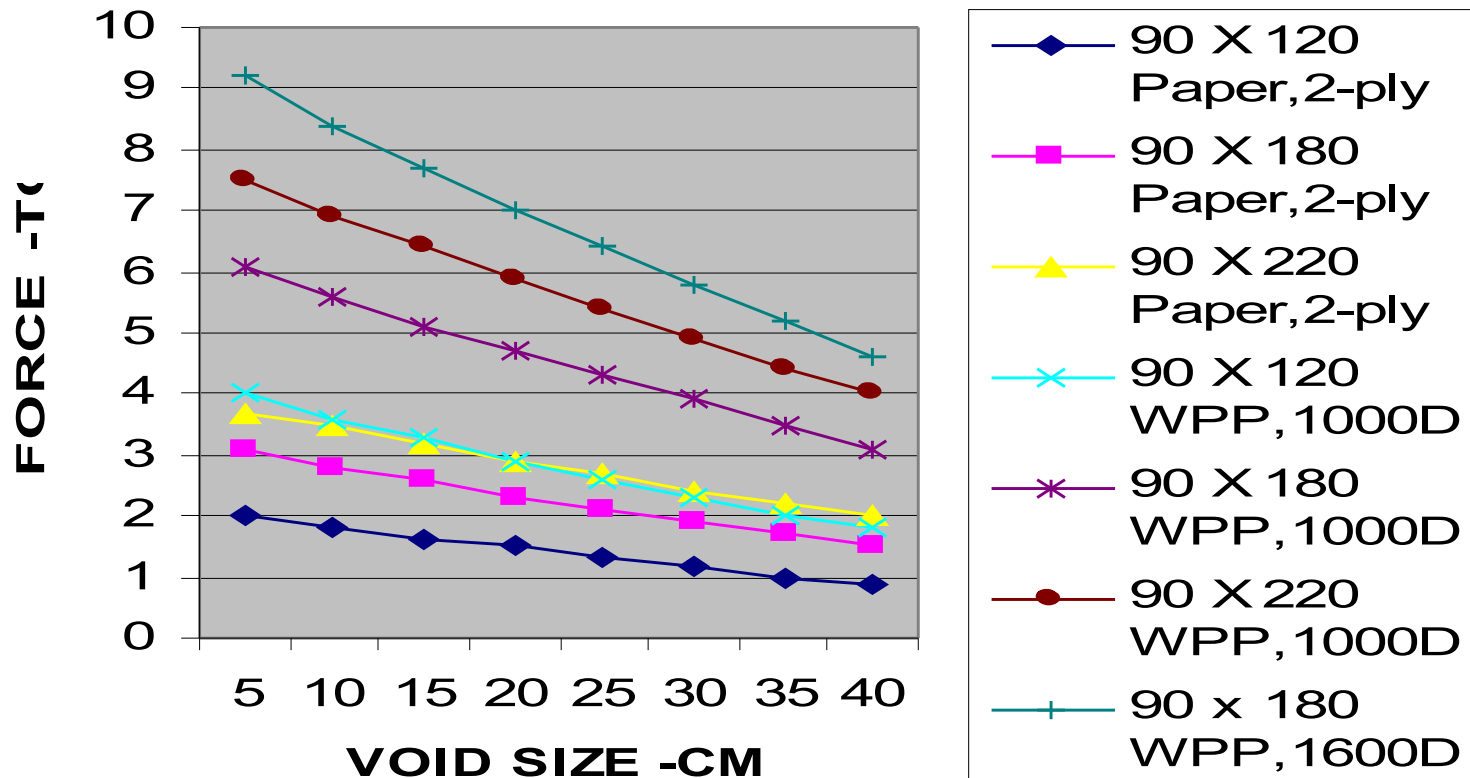
Level	Fabric Denier	Working Pressure .kPa
1	900	20
2	1000	40
3	1600	60

Forces

- Given Bag: 90 x 180 cm , 1000D
- Contact Area , 80% : 72 x 144cm =1.04m²
- Force = Pressure x Area
- Force = Working Pressure x Contact Area
- Force = 40kPa x 1.04m²
- Force = 41.6 kN
- Force = 41.6 /9.81m/s² = 4.2 tonne

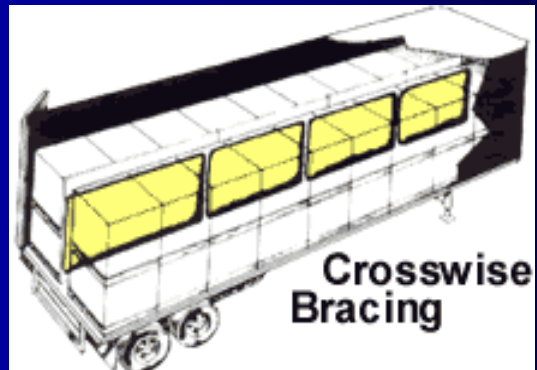
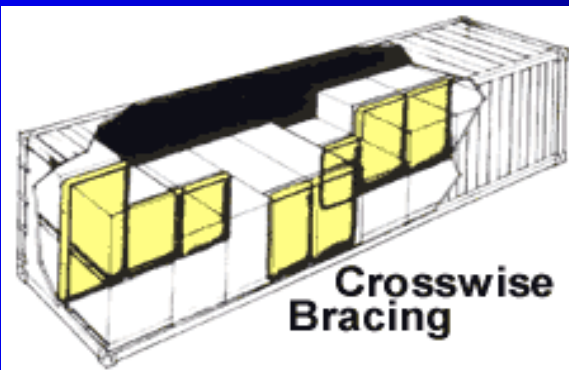
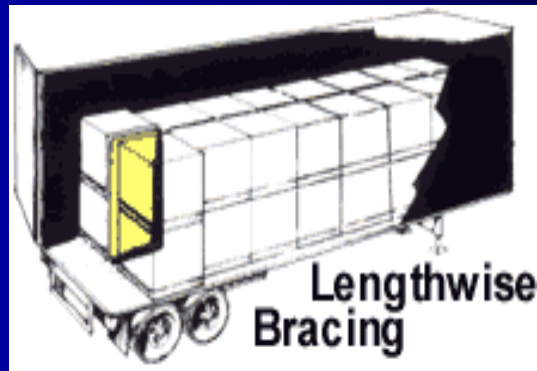
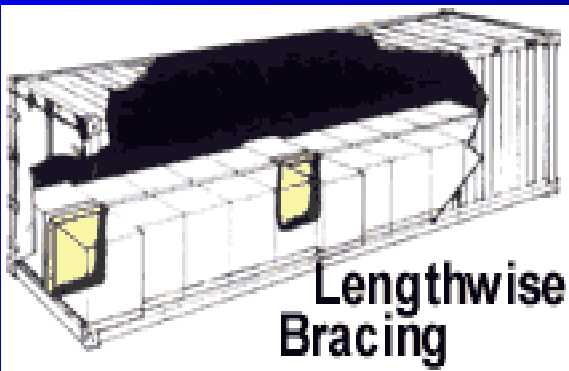
Typical Forces (Tonne)

DUNNAGE BAG FORCES



Loading Plan

- Have out a loading plan



How To Install The Bag?



Step 1: Choose the right size for maximum contact

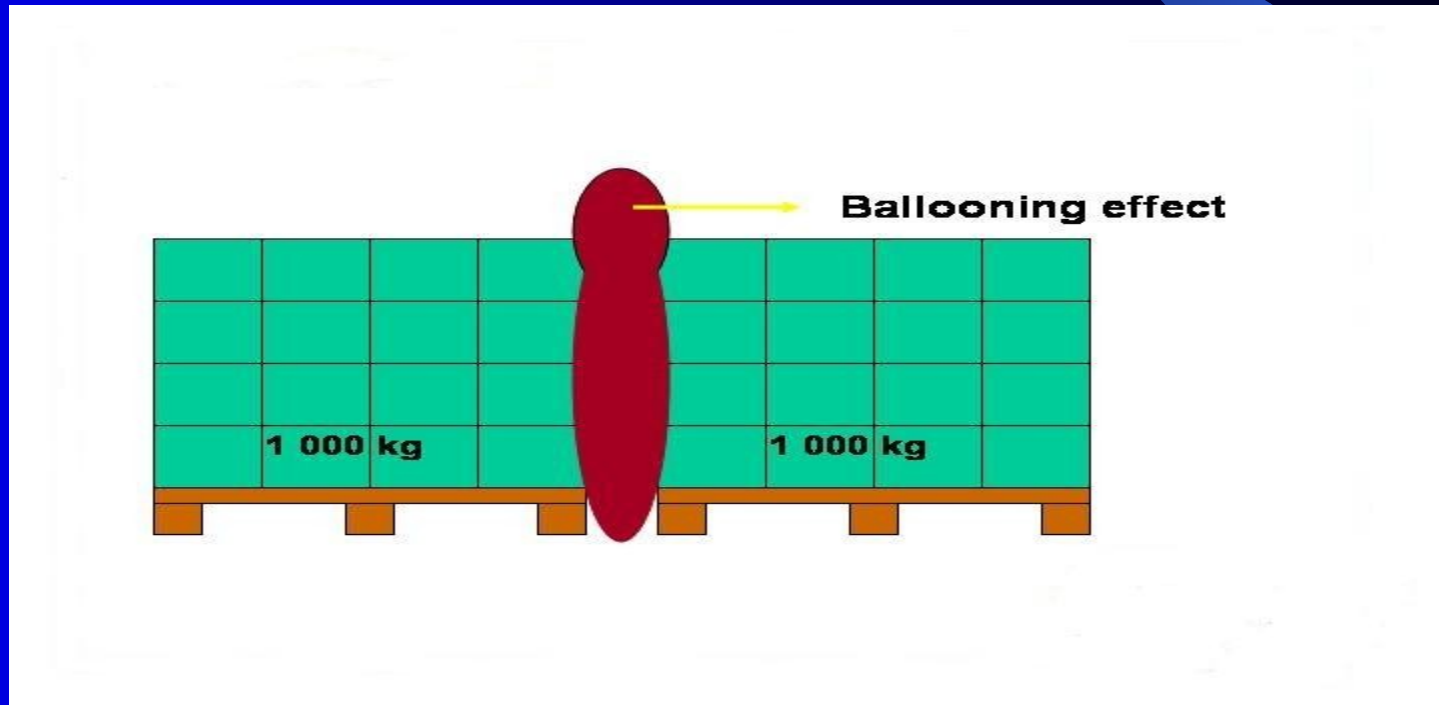
Step 2: Protect the bag from sharp objects

Step 3: Position the bag correctly

Step 4: Inflate the bag till the cargo is properly secured

Situation To Avoid #1

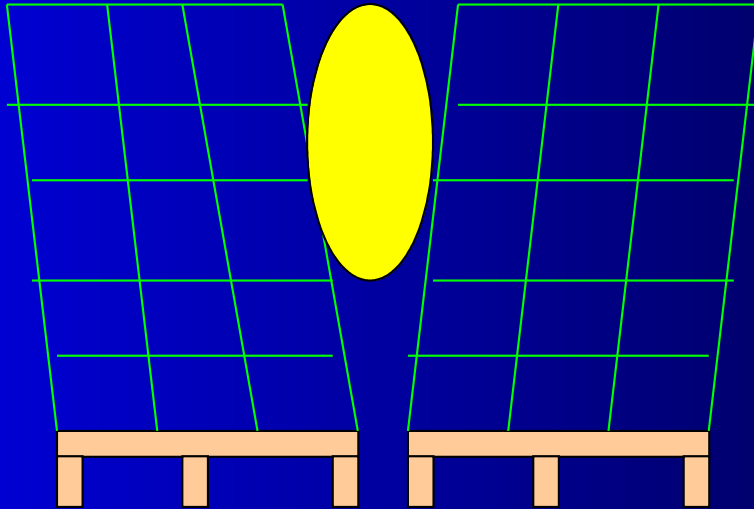
- Using too big a bag



Situation To Avoid #2

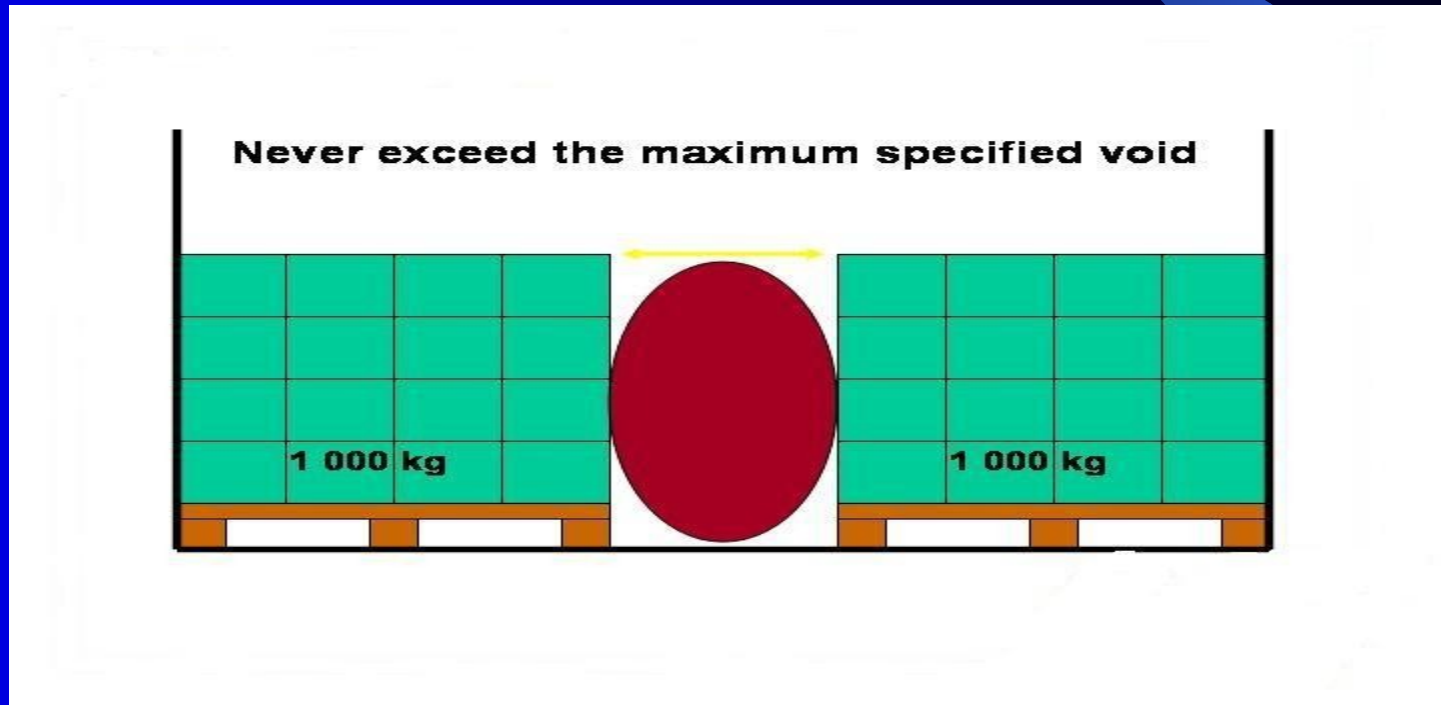
- Using too small a bag

TILTING



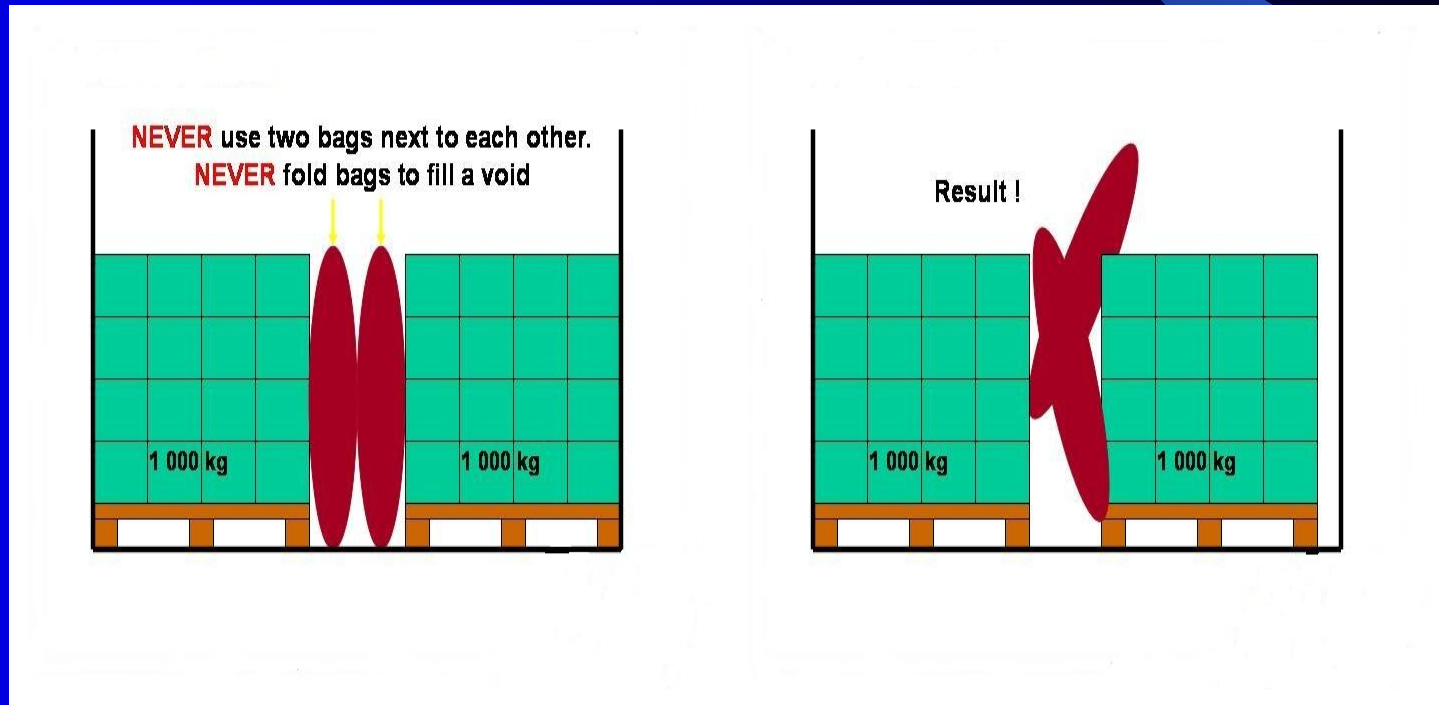
Situation To Avoid #3

- Too big a void



Situation To Avoid #4

- Never use two bags together



Situation To Avoid #5

- Do not place a bag next to the door



Situation To Avoid #6

- Do not under-inflate



Situation To Avoid #7

- Do not over-inflate the bag
- Signs of over-inflation :
 1. Cargo shape is distorted
 2. Container walls are bulging

Situation To Avoid #8

- Using an inflation tool with a sharp tip
- puncture the plastic bladder

Situation To Avoid #9

- Ensure the bag is not exposed to any sharp edges eg. edges of pallet, tins & nails etc.
- Sandwich the bag between 2 pieces of cardboard before inflation.



How to correctly inflate the bag?

- Use a regulated air supply set at the recommended pressure
- Give a few quick burst of air to open up the bladder before filling
- Check that the load being secured cannot be moved and is not distorted
- Observe that the container walls are just beginning to buckle
- Stop inflation, tighten the valve cap and insert the plug

How many bags are needed?

- According to the US FMCSA rules, the aggregate working load limit of any securement system used must be at least one-half the weight of the load.