



BRUCHAPanel®

SECURING LOADS

Special Notes for
Handling and Transport
of Sandwich Panels



Foreword

BRUCHA Gesellschaft m.b.H is a leading manufacturer of roof, wall, and facade panels for cold storage and industrial hall construction in Europe. Over three million m² of sandwich panels and insulation materials are produced and transported in Austria and beyond annually at the Michelhausen works in Lower Austria. We also manufacture elements for cold storage construction including: doors, cold rooms, profiles, crash-barriers and diverse customized products, many of which are installed in international projects by our assembly department. The majority of our goods are transported by forwarders, a smaller proportion with our own HGV fleet.

Safety, quality, and reliability are of particular concern for successful contract fulfillment and resulting customer satisfaction. Besides well trained staff and the faultless technical condition of the vehicles correct securing of the load is essential for problem and damage free transport.

The content of these brochures is based on the expert knowledge of Rainer Köbl (D) and Ing. Harald Leitgeb (A), who are known in Europe as logistics experts specialized in the transport of sandwich panels. The GBS guidelines for the transport of light metal components published in cooperation with the IFBS Germany are additionally applicable.

Better safe than sorry, responsibility is a load we all bear.

Ing. Engelbert Ruhm
Quality management/Safety specialist

Michelhausen, January 2011



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Proper Loading

Our loading staff are trained to observe legal regulations and if necessary refuse loading if conditions for safe transport of our goods are not met. Loading is carried out exclusively by instructed loading staff.

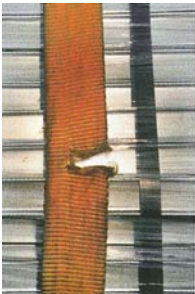
The driver has to follow instructions from the loading staff and must additionally hold a technical qualification pursuant to VDI 2700a (load securing training certificate).

Pre-Loading Inspection

Minimum vehicle requirements:

- Empty, clean loading area (swept)
- Adequate number of lashing points
- Undamaged fore and side walls and canvas
- Functioning side locks
- Vehicle superstructure suitable for length of panels to be transported

The required lashing and loading aids are to be provided by the forwarder. The lashing aids must be in technically proper condition and (annually) tested.



Lashing strap labeling pursuant to DIN EN norm.

Damaged straps represent a great but often underestimated hazard and may therefore never be used!

Sandwich Panels

Sandwich panels come in two types, PU/PIR panels with polyurethane core, and fire-protection panels with mineral wool core.

Here should always be noted that for combined loading due to their weight (around three times that of PU/PIR panels) fire-protection panels should never be loaded on top as this leads to a top-heavy load.

Edge protectors must be used when securing with lashing straps; the edge protectors must be positioned flush on the panel and may not be pressed into the panel stack.

ATTENTION: Edge protectors may fall down when opening the straps!

When loading a principle point to consider is whether the underlying pack can bear the additional load without being damaged.

For example no heavy profiled sheets or fire-protection panels may be loaded onto an ECO-roof. Spacers are already included in the packaging (protectors) to prevent packs loaded side by side sliding into each other. If necessary spaces are to be filled with PU boards.

As shown in the illustrations (page 2 and 3), the panel stacks are wrapped in plastic film. For open transport care must be taken that these are not ripped open as otherwise, particularly for high speeds (on motorways) and long journeys the loss of packing or loading equipment represents a possible hazard to other road users.

A special transporter (over 13.6m) may be required for long panels. In this case in addition to proper pack handling (use of a load distributing cross-beam for loading & unloading – see our Internet site at: www.brucha.com - downloads - BRUCHAPaneel handling) and proper load securing, the legal regulations pursuant to the Austrian Road Traffic Regulations (route approval, escort, etc.) are to be observed.

In general it is recommended for longer journeys to inspect the condition and safety of the load at regular intervals, at least during the legally prescribed breaks.

Particularities of Our Loaded Goods

Doors and Gates

Single doors are packed in cartons. When loading take care that no other heavy or sharp cornered packs are loaded on top. Multiple doors can (with padding between to prevent slipping and damage) be stacked onto a pallet to make a pack, which may then only be lifted by the pallet itself. For large sliding doors the provided frames are always to be used, separately secured to the loading area.

Small Parts

Cartons are to be protected from the wet and may never be simply placed onto the loading area. **Small parts** should preferably be loaded into mesh boxes, as otherwise the cartons may be pressed down during lashing and seriously damaged, loss of load through loose cartons may also be avoided. **Profiles** are to be loaded in bundles and may **NEVER** be loaded loose on pallets; if possible they should be transported in the boxes provided. Profiles are particularly susceptible to damage as they are generally made of thin sheets. When lashing down take care that straps are never led directly over sharp edges (use edge/strap protectors!).

Sheet Steel Coils

Coils are mounted on special pallets and may reach a load up to approx. 6,000kg; during loading the correct load distribution (axle distribution) and adequate securing against slipping are therefore to be noted. The use of anti-slip mats is expressly recommended, as when securing coils the strap angle is in most cases very acute (see the following illustration) therefore preventing adequate pre-tensioning for securing the load against slippage.



Securing the Load against Slipping



The load must be adequately secured for emergency stops, hard evasive maneuvers and poor road stretches. The following forces can occur during normal driving:

← 80 % of the load capacity in the driving direction



50 % of the load capacity laterally and to the rear

The unsecured load will slip if the force ($F = m \times a$) is greater than the friction ($F_R = \mu_D \times F_G$).

Common Coefficients of Sliding Friction

For calculation of the required securing force the frictional coefficient is of particular importance, common values are listed in the following table. Further details can be found in the VDI guidelines 2700 ff.

| Material Pairs | Coefficient of sliding friction μ_D |
|---|---|
| Wood/Wooden pallet | 0,3 |
| Steel/Wooden pallet | 0,3 |
| Cardboard box/Wooden pallet | 0,35 |
| General value for anti-slip material (anti-slip mats) | 0,6 |
| Film/Film* | 0,7–1,3 |

* Source: manufacturer's declaration

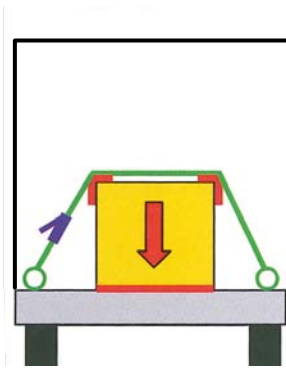
ATTENTION these values can reduce to zero for soiled or wet surfaces!
The use of anti-slip mats increases safety particularly for poor material combinations and also reduces the risk of damage to the load.

Securing the Load against Slipping

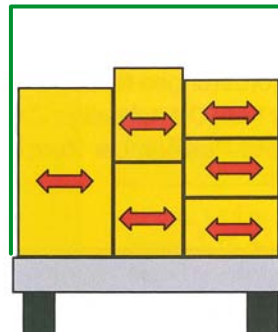
Friction Locking

Friction lock securing works through the increased friction produced by lashing (pressing) the load down onto the loading area. This requires correct strap tensioning and strap tensioning brackets; the more acute the bracket the lower the force applied for securing the load.

Friction Locking



Interlocking



Interlocking

Interlock exists when the gaps between the individual packs and from the nose are less than 3 cm and in sum less than 12 cm. The gaps may be filled with Styrofoam or similar or pallets. Note however that these may not be placed loose on the loading area; vibration can loosen the packing material which may then be lost in transit.

ATTENTION; As these gaps are already very small take care during loading and unloading, particularly of long elements, to prevent any possible damage to individual packs; these should not be pushed or slid over the loading area.

As the packing film is very thin and has a good frictional coefficient, this would result in damage to the packaging.

Correct Number of Straps and Permissible Strap Tensioning

When securing sandwich panels friction locking must generally be assumed as otherwise damage to the panels is likely. The coefficient of friction is decisive for the required number of straps and their tensioning.

As can be seen in the table above a frictional coefficient value of 0.7μ is to be assumed for film-packed panels. The load has to be primarily secured against lateral tipping and lifting.

The following rule of thumb stems from experience and calculations pursuant to VDI 2700:

Every panel stack up to a length of 4m must be secured with at least two straps, for packs longer than 4m additional straps at intervals of 1.5m are to be used.

For identical stacks next to and on top of each other an extra strap between the layers after the second layer is recommended. To prevent springing of the load run the straps as close as possible to the EPS spacers.

To prevent damage to the panels the allowable pre-tensioning of the ratchets should never be fully used; and as already noted edge protectors are to be used when securing the panels.

Measurements have determined that straps are adequately tensioned when they can be twisted through 90° – 120° .

However bear in mind that the straps may loosen during transport on long journeys so that safety can no longer be guaranteed.

Regular inspection of the straps is therefore essential.

Inspection – Unloading

INSPECTION Before LEAVING the Works

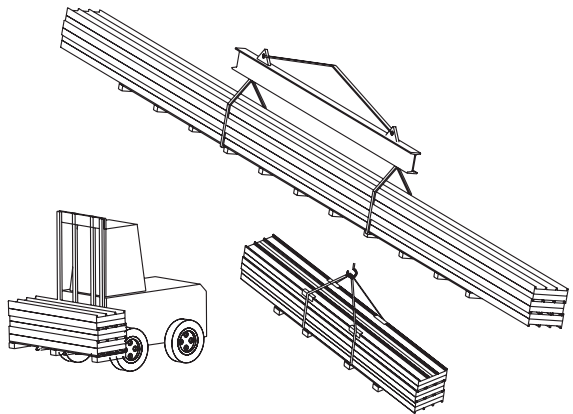
- Condition and Completeness of the Load
- Photographic documentation of the load by the stacker/forklift operator driver
- Adequate number, condition, fixing and tensioning of straps
- Final check label in place
- Sides and canvas (when applicable) closed
- Long vehicle marking in place
- Transport documents in place

UNLOADING

Only use straps for unloading.

Only apply straps using edge protectors.

Gantries or cross-beams are to be used for panels over 8 m.



Never unload two panel stacks simultaneously!

Extreme care must be exercised when unloading using a forklift.

The driver must observe the unloading procedure in detail.

The responsibility for proper handover lies with the driver.

What to do in Case of Transport Damage



It is assumed that after the following check there are no obvious faults on the part of the manufacturer. Proper loading is photographically documented by the loading staff. To avoid possible damage during unloading follow the instructions for handling and storage on the packing lists or on our internet site.

As evidence of transport damage only photos of the damage in loaded condition can be accepted. The nature and extent of the damage is to be noted on the delivery documents (CMR, delivery note). Damage is to be reported immediately, our dispatch department staff will try to find a solution to the problem – as a rule the earlier a fault is recognized the lower the costs for all involved. The satisfaction of our customers has top priority.

Point of contact in emergencies:

BRUCHA Dispatch Department – phone: +43 2275 5875 ext. 2400
Sales and sales administration acc. to delivery documents

Further Details on Securing Loads:

GBS guideline 2009, Rainer Köbl

www.lasiportal.de
www.ladungssicherung.de

Neulengbach Training Center

Ing. Harald Leitgeb • tel.: +43 2772 52 198

Ing. Leitgeb is available for other questions concerning load securing or problems during traffic inspections – mobile: +43 676 43 510 49.



PORTFOLIO

Consulting, planning, construction, production & assembly:

- Cold rooms and freezers: Professional cell €CO-Box – simple self-assembly*
- **BRUCHA**Panel PU/PIR panel for industrial cold storage construction*
- **BRUCHA**Panel PU/PIR panel for industrial halls construction*
- **BRUCHA**Panel fire-protection panel, with mineral fiber for roof, wall and facade*
- **BRUCHA**Panel Glasbord® panel
- Test chambers
- Welded floors in stainless steel 4301-V2A
- Welded walls in stainless steel 4301-V2A
- Crash barriers in stainless steel or plastics
- Refrigerated and freezer room doors*
- Hinged and sliding doors*
- Swing doors and strip curtains
- Special constructions such as CA storerooms, conditioned and climatic rooms, cold smoke rooms, labs and test rooms, flash-freezing rooms
- High-rise warehouses
- Clean room construction*
- **BRUCHA**Panel Acoustic – WP-A panel*
- **BRUCHA**Panel PU/PIR €CO-Roof panel*
- **BRUCHA**Panel PU/PIR Transparent Roofing Sheets – DP-L panel*
- Customized constructions on request

* For further details please request a copy of our detailed folder.

www.brucha.com

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