



NETWORK ENGINEERING OY AB

FIX ROAD® & FIX STRAP®

cargo securing systems

Operating Instruction Manual



NETWORK ENGINEERING OY AB

NWE NETWORK ENGINEERING OY AB
Uppstutåget 2
FIN-64200 Närpes, FINLAND

VAT: FI 09628099
Tel: + 358 622 50 114
www.nwe.fi info@nwe.fi

Introduction

Please ensure you read these instructions and understand them fully and that you have been trained in the use of the system by a competent person before using FIX Road lashing systems. If you are in any doubt please refer to your Safety Officer for advise before proceeding. Your 'FIX Road' or 'FIX Strap' lashing systems has been specially produced for you by NWE Network Engineering, specialists in cargo control systems for Road and Sea.

When correctly used, all FIX lashing systems give a very high degree of load restraint. With FIX the cargo is 'over-lashed', securing it to the cargo bed and making it unitized with the vehicle load platform. In addition to this the FIX system is kind to sensitive cargoes as FIX distributes the lashing load evenly across the entire contact surface of the cargo thus reducing damage though point loading that can sometimes occur when using a 50mm webbing lashing for example.

The FIX Road can be operated without mounting the vehicle load platform. The entire lashing operation can be conducted from ground level therefore re-moving the inherent dangers of mounting the vehicle load platform and other risks involved such as throwing a lashing over a load to an unseen side.

Operating Instructions

Your FIX Road system is a specially reinforced high tensile strength tarpaulin that is suspended at roof height on a bungee/roller system running in rail the length of the load platform. The FIX can be supplied as a full-length system (single-element) or in several individual sections (multi-element). The FIX is fitted with 50mm webbing lashing straps at 1.3m intervals along its length to which ratchet tensioner will be attached during the lashing process for securing the load. Fixed winches can also be suitable. When the system is not in use, the bungee cords pull the FIX tarpaulin or straps up to roof height automatically to make a clear loading space and then the system is pulled back to the rear of the trailer. This position will be called the 'Stowed' position for the purpose of these instructions.

At no time should the ratchet tensioner be left attached to the lashing straps when the FIX is being pulled along its rail or when in the stowed position. Prior to commencement of loading ensure that all the elements of the system are drawn to the opposite end of the vehicle to which loading will commence. This would normally mean that the FIX system should be pulled back to the rear of the vehicle to ensure the maximum width aperture is available for loading. In certain circumstances, however you might wish to review this procedure. Do not load through hanging straps. The lashing procedure can be approached in 2 ways.

Loading and FIX Road positioning:

- 1) With either a single or multi-element FIX Road system in the stowed position to the front of the trailer, normally loading would commence from the front bulkhead end and continue rearwards. Once loading is complete, the FIX system or elements thereof may be drawn over the top of the load. This is done by pulling one of the yellow pull cords where fitted or one of the lashing straps. The FIX system will follow on its roller rails to the position you require.
- 2) Where a multi-element system is used, the FIX Road systems may also be individually positioned over the load progressively as loading proceeds.

3) Multi-element FIX Road system can also be ready pulled over the cargo space before loading begins. Then special care has to be taken to avoid FIX or its parts to get pulled away with the cargo or the forklift.

Loading procedure:

1) Where possible load the cargo evenly with similar height cargoes at either side of the platform. This will ensure the most effective and secure method of lashing. If any items are placed in a position where the FIX will not make significant top contact with the load, then they will not be properly secured. Take care to avoid this eventuality. Ensure that no sharp objects are left protruding where the FIX is due to come down and cover. Any sharp object it comes into contact with will cut and damage the FIX system and will affect its lashing strength capability locally.

2)



The FIX is now ready for lashing.

Always commence the lashing procedure by tensioning both ends of the cargo first. The reason is to secure the cargo from moving forward or backward. When lashing a 'Single-element' FIX always continue the lashing procedure at the lowest point of the cargo and work outwards from either side. When using a 'Multi-Element' FIX you additionally have a possibility to do the tensioning in sections. The first and the last pair of lashing lines can be mounted so that a necklace is formed like in picture below. Then the lashing line should be at max. 45degrees. Only use approved lashing points that tolerate the lashing angle. The rest of the lashing lines should be as straight down as possible to maintain the lashing force caused by pre-tensioning. Never make the lashing at an angle when securing to the rave as the hook will slip along and the strap will become lose. Only where the tensioner is attached to a fixed lashing ring (captive) the lashing strap may be inclined. Attach the ratchets to the FIX's lashing webbings (usually orange). A tensioner is required at each side of the



FIX. Pull the loose end of the lashing webbing through the slot in the ratchet barrel until all the slack is taken up. Once the FIX makes good contact with the top of the cargo, commence initial ratchet tightening. Repeat this operation sequentially on either side, do not over tension at this stage. The object of this initial lashing procedure is to ensure the FIX is evenly positioned at both sides of the cargo with initial tension applied. Make sure that when doing this the maximum amount of webbing is pulled through the ratchet to avoid the tensioner barrel to fill up prematurely and jam the tensioner before the webbing strap has tightened sufficiently. Finally tidy lose cords and lashing webbing ends to ensure they are secure and do not trail.

Unloading:

There is a need for caution prior to commencement of releasing any lashings. Check beforehand that there has been no movement of the load as releasing the lashing may allow parts of the load to fall out. This might cause injuries or damages.



In normal circumstances, however, with the FIX system correctly engaged, your load will arrive in a stable and secure condition. In these circumstances, the unloading procedure is the reverse of the loading procedure. It is important to remember that when the lashing has been released, the tensioner end must be removed from the FIX lashing strap webbing end before sliding back the FIX. There is a good reason for this; the strap end will swing outward if the tensioner end is still attached when sliding the FIX on its rails. A heavy metal tensioner swinging freely could badly injure anyone who is in the proximity of the vehicle.

Care and checks:

Always ensure your FIX system is correctly stowed for the current circumstances. If left in the wrong position when load or unloading, the lashing straps can be caught up in the load or e.g. fork lift and either damage the system and/or cause a serious accident.

- The FIX system should be visually inspected before and after each use
- If your FIX system has sustained any damage it must be reported to your supervisor.
- Damaged straps and tensioner equipment should be replaced.
- Damage to the FIX must be inspected
- Faulty or damaged equipment should not be used.
- NEVER lashing onto a collapsible cargo
- Always use an appropriate tensioner.
- Never tie off the lashing straps instead of using a tensioner.
- Never load through hanging straps.
- The FIX and or its straps must not come in contact with sharp or abrasive objects
- Always ensure the lashings are perpendicular when lashing to the rave. NEVER lash at an angle unless to approved captive lashing rings.
- Only use approved lashing points

- Ensure loose ends of webbing and tie cords do not trail. Ensure they are tidy and secure.
- Do not attempt to continue your journey or undo your lashings if you suspect a shifted load
- NEVER leave tensioners attached when in stowed or positioning mode

This operating manual has been prepared on the assumption that good working practice and a sensible approach will be adopted by the operator. It attempts to cover many of the operational aspects relating to the system that may be experienced on a day-to-day basis but cannot predict every eventuality that may be encountered.

Correct use of the equipment is essential at all times and a common sense approach to its use and operation is expected. Any misuse, abuse, damage, incorrect or unauthorized use of the equipment will be the entire responsibility of the operator. This equipment must only be used by personnel that have read and understood this manual and have received training on how to operate the system correctly and safely.



NETWORK ENGINEERING OY AB

NWE NETWORK ENGINEERING OY AB
Uppstutåget 2
FIN-64200 Närpes, FINLAND

VAT: FI 09628099
Tel: + 358 622 50 114
www.nwe.fi info@nwe.fi

FIX STRAP Technical description

FIX Strap is an ordinary lashing strap including the strap, the ratchet short end and some extra parts to make it more versatile and easier to use than normal loose straps.

FIX Strap extra parts consists of a bungee suspension system, which lifts the strap up to the roof while not in use, and the parts needed to attach the bungees to the strap. At the roof there is the same rail system as with FIX Road.

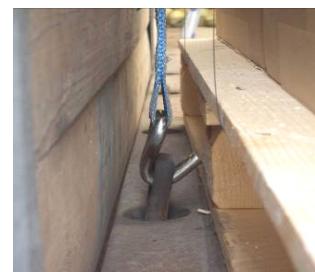
At one side of the truck (the same side you decide to have the hook of the long part of the strap) the strap is attached to the bungee with FIX Slide. The strap is thread through FIX Slide like in the picture. Do not thread the strap any other way as then the adjustment is more difficult and tension in the strap when tightened will deform FIX Slide. Place it roughly 5-15 cm closer to the hook than the height of the cargo space.



The other end of the bungee is attached to another FIX Slide, but here the strap is thread only once through the lower (larger) opening.



After loading the hook at the long end of the strap is placed in a lashing point at the rave by pulling the strap down tensioning the bungee cord. The bungee tension will keep the hook on place while tensioning, which makes it easier, faster and safer to ensure the hook stays in the place. The ratchet short end is placed and tightened as normally. The strap will slide through the FIX Slide until the strap is tightly around the cargo. The ring is so large that the other bungee can slide trough it if the load is very low.



When unloading the cargo, and loosening the ratchet, the bungees will pull the strap up to the roof again and it can be sliding out of the way.

The advantages of the FIX Strap system are:

- straps can be easily pulled to right position
- hooks will stay in place during loading operations with the tension of the bungee cord
- bungees will pull the strap out of the way when released for unloading
- uses ordinary standard 50mm straps which allows damaged straps to be replaced
- same FIX Strap can be tuned in for different inner heights
- same roller and suspension system as in FIX Road, makes easy upgrade possible



Assembly instructions for the FIX Road® and FIX Strap® systems

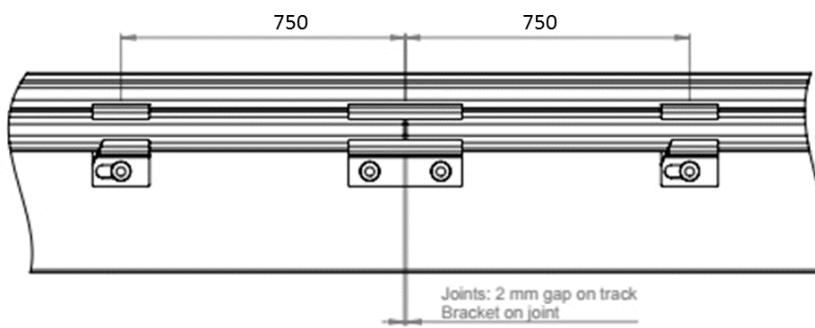
Before you start:

- Mounting of the rails in FIX Load Securing system should be done by two persons to improve result and avoid injuries.
- The rails need to be mounted as high as possible with the opening facing inwards.
- Check that eventual moving roof, side curtain and beams etc. has enough space for the operation and make sure eventual locking device and side doors can move freely.

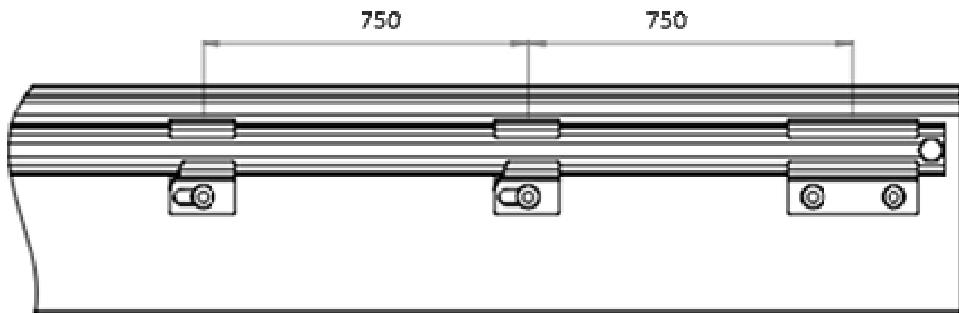


Installation:

1. Drill holes in the profile with a distance of 750 mm center to center (figure 11).
 - A) When mounting on a vertical surface use wall mounting brackets like in drawing above.
 - B) If the rails are mounted on horizontal surface (roof sticks), use different brackets. Then the length of the rails may need to be cut acc. to mounting possibilities. Brackets are mounted on every second or every third roof stick depending on which suits better with approximately 750mm distance from each other.

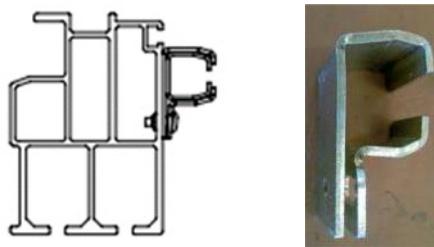


Drawing 11. Wall mounting brackets and a wider joint bracket over the track joint.



Drawing 12. Wall brackets and locking nut at end of track.

2. Mount the first bracket at the end of one side of the truck. Use screws or rivets to mount the brackets. Rivets must be of a folding type (Monobolt).



Drawing 13. Note that bracket mounting must not disturb other functions in the beam.

3. Lift the rail into position and support it.
4. Mount the other brackets on place. The rails are supplied in 6m or 6,7m sections. You will note that one end of each rail is slightly more flared than the other which is more square. This is a natural aspect of all cold rolled section. It is important to match the ends together when making a smooth coupling. So ensure square to square, flare to flare. This way you will make the best joint and allow the carriage assembly to run smoothly through it. When installing the rails, the flared end should be to the front of the trailer to allow for square to square to be together at the main join of the 6m sections. The final piece should be installed to the end of the second 6m section, flare to flare. Rail joints are covered with a special wider bracket. At rear a 'get-out' section should be allowed for by stopping the rail about 100mm short of the full trailer length to allow for the introduction and removal of the roller carriages.
5. Properly tighten all screws on brackets.
6. **Note!** Check that the brackets are securely mounted before mounting the roller carriages.
7. Start mounting the roller carriages into the rails.

a) Before introducing the bungee carriage units into the rail release the tension of the bungees by unclipping the snap hook from the nose of each carriage. Once safely in

the rail, pull the carriage assemblies well onto the length off the rail and then reconnect. Substantial tension is then accumulated within the system when the bungees are reconnected so take special care ensuring the roller carriage does not roll back and escape the rail ends during installation as the sudden realize force can be substantial and could cause injury.

b) The carriage frame is cranked. Ensure the crank is facing down when installing.

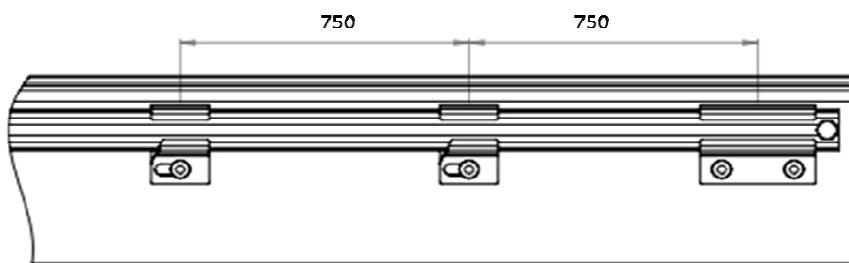
c) Ensure the bungees are not twisted or tangled together.

The elastic cords should run parallel and not cross nor curl around each other. This should be done so that one person holds the roller carriage in place on one side while the other person mounts the roller carriage on the other side. Please take care that the roller carriages don't escape from the rail while mounting them on the other side. The tension in the suspension lines can cause injuries if the roller carriages escape.



Picture 14. Correct position of roller carriage and bungees.

8. As the roller carriages are mounted, push them towards the front of the trailer. Place the roller carriages evenly along the length of the rails.
9. Fasten a locking bolt (M8 x 12 DIN 933 Hex Cap Screw with Nylon Insert Lock Nut) to both ends of the rails to stop the roller carriages from escaping (Figure 15).



Drawing 15. Locking bolt and last wall bracket mounted.

Assembly instructions for bungee system with fixed positions

Mounting bungee suspension system without track is also possible. Then the choice is bungee rollers for fixed position mounting.



Fixed position roller seen above and as mounted on a cant rail.

The mounting should be done with strong enough screws, rivets or bolts that are no smaller than M8 to tolerate the tension in the bungee in all situations. Ø8mm holes are in the frame of the roller for this purpose.

Choose a location where mounting does not interfere with other functions of the cant rail, such as movement of side curtain, pillars and the roof sticks.

Place the fixed rollers in locations along the trailer length where the straps will most probably be used to avoid unnecessary longitudinal force of the bungees when tensioned as straps are placed over the loaded items.

Use of the bungee system is otherwise similar to the use of movable bungees.

10. The Fix fabric is received folded. Spread out the fabric with the tag for the type code to the rear of the trailer as seen in figure 16. The tag for the type code must always be accessible in the rear of the trailer.



Figure 16. Spread out the Fix fabric with the tag to the rear of the trailer.



Figure 17 & 18. Tag for the type code tells (from top down) the size and model of the cover, production month and year, serial number, DEKRA approval number, number of straps and strap length . Tag for strap tells breaking strength BS, lashing capacity LC, material, length, applied standard and manufacturer.

Lift the Fix fabric up and then attach the suspension lines to the metal rings on the Fix as seen in figure 19.

11. Start with the suspension lines in the rear of the trailer and move on towards the front as seen in figure 20. The tag for the type code should be found in the rear of the trailer.

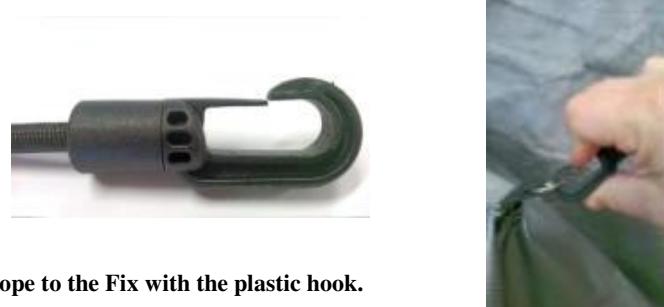


Figure 19. Attaching the bungee rope to the Fix with the plastic hook.



Figure 20 & 21. Work from the rear to the front of the trailer.

Note! The Fix fabric should be lifted and not the suspension lines pulled down all the way when connecting the hook to avoid injuries caused by the tension in the lines.

12. When the system is not in use the bungee cords pull the FIX tarpaulin up to roof height automatically and then it can be pulled to one end of the body to make a clear loading space. This is the 'Stowed' position (figure 22).

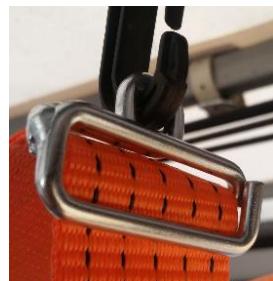


Figure 22. Fix tarpaulin in stowed position

Mounting of FIX Strap

FIX Strap uses the same tracks and bungee suspension system as FIX Road.

Instead of attaching bungee cords to the FIX Road fabric as above, the bungee cords are attached on both sides to FIX Slide, which supports the lashing strap.



On the hook side the strap is thread through FIX Slide like in the pictures. Do not thread the strap any other way as then the adjustment is more difficult and tension in the strap when tightened will deform FIX Slide.

Adjusting the height is easiest to do so that the strap is pushed through the FIX Slide from both sides at the same time and then adjusting the loop size of the strap before pulling it out again.



The free end (on ratchet side) the strap can slide freely through the lower (larger) opening of FIX Slide. It does not matter which way the strap is thread through if it is only going through FIX Slide once. Now the strap will slide easily through on one side of the vehicle and will be adjusted to fixed position on the other side, so it can be attached to the rave and will stay there with bungee force while the other side is tensioned. It is not allowed to load or unload through hanging straps.

They must be drawn completely clear of loading / unloading aperture.

Screw hooks assembly

Tools needed:

17mm FLARE NUT wrench



or 17mm



standard wrench

Pliers



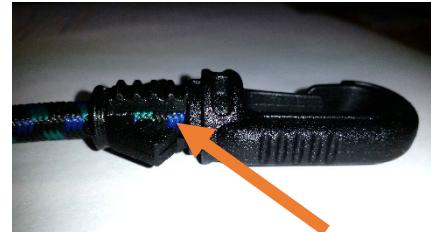
Hook parts: hook



and locking nut



Place the bungee through the nut and into the hook.



NOTE! The threads inside the nut towards the free end of the bungee cord.

NOTE! The bungee need to reach all the way.

Take a steady grip of the hook. Screw on the nut by hand until it stays correctly on the threads.



When hand force is not enough, take a steady grip of the hook with pliers and turn the nut with wrench until the nut is completely on place.

Some options might become handy.



Figure 23. Replacement strap



Figure 24. & 25. Adjustable hook and how the strap is routed



Check and how the strap is routed

EC DECLARATION OF CONFORMITY

Manufacturer's name: NWE Network Engineering Oy Ab

Manufacturer's address: Uoppiutajahti 2
FIN-64200 Närpes
Finland

We hereby declare that the safety functions of the following product:

product name:	FIX Cargo Securing System
versions:	FIX CC, FIX PC, FIX PP, FIX STRAP FIX RORO, FIX STOW, FIX CONT

fulfils all of the relevant safety requirements of:

EU Best Practice Guidelines for Cargo Securing for Road Transport,
Stowage and Securing

IMO/MOL UN ECE Guidelines for Packing of Cargo Transport Units,
CTUs with IMO Model Course 3.19 and Quick Lashing Guides

Lashing point breaking strength (BS) 50kN

Maximum Break Load (MBL) 40kN

Lashing point breaking strength (BS) 2, L2, C2500kN

Lasting Capacity acc. IMO rules MSL, 2500kN

Standard Tension Force: 5% minimum 400kN

Signature:

In Närpes, 15 Apr 2013


Mats Ronnåkog
Managing Director

NWE NETWORK ENGINEERING OY AB/ATU: FI 096 28099
Uoppiutajahti 2
FIN-64200 Närpes

Tel: +358 622 50 714

email: info@nwe.fi

Fax: +358 622 50 130

www.nwe.fi

DEKRA Automobil GmbH 1 von 2 Niedersachsen Breisgau FB: Fahrzeugechnik / Verkehrsuntersuchung / Ladegutsicherung Otto-Brenner-Str. 168 D-33804 Bielefeld Tel.: +49 521 / 2 99 05 - 28 Fax: - 70 E-Mail: matthias.stenau@dekra.com		
Rechtsvorschriften: DIN EN 12229-38, 186-533548 Seite 1 von 1 NWE Network Engineering Oy Mats Rönkkö Uppställsgatan 2 FIN-64200 Närpiö / Finnland		
Datum: 12.04.2006 Stand: 25.01.2011 Dipl.-Ing. Matthias Stenau GSM: +49 / 171 / 2 15 63 51		
<p>DEKRA-Zertifikat 313 / 11068 YF 1804132209 für die Übereinstimmung der NWE-Ladegutsicherungspläne vom Typ Fix-Road als zusätzliches Ladegutsicherungsmitel nach den anerkannten Richtlinien und Regeln der Technik zur Ladegutsicherung:</p>		
<p>1. Erfüllte Rechtsvorschriften:</p> <ul style="list-style-type: none"> → § 22 StVO (Straßen-Verkehrs-Ordnung): Ladeut ist zu sichern* → § 23 StVO (Straßen-Verkehrs-Ordnung): Pflichten des Fahrzeugführers* → § 30 StVO (Straßen-Verkehrs-Zulassungs-Ordnung): Fahrzeugsicherheit* → § 31 StVO (Straßen-Verkehrs-Zulassungs-Ordnung): Betriebsverantwortung* → § 412 TRG (Transport- Reform-Gesetz): Betreisssichere Verladung* 		
<p>2. Erfüllte Richtlinien und Normen:</p> <ul style="list-style-type: none"> → VDI 2700: Lastverteilung an Straßenfahrzeugen → VDI 2700 Blatt 2: Berechnung der Zurr- und Sicherungskräfte → VDI 2700 Blatt 3: Ladegutsicherungsmitte → VDI 2700 Blatt 4: Lastverteilungsplan → VDI 2700 Blatt 5: Qualifizierungssystem zur Ladegutsicherung → DIN-EN 12195-1: Berechnung der Zurr- und Sicherungskräftekräfte → DIN-EN 12195-2: Zurgtute aus Chemiefasern → DIN-EN 12840: Zurr- und Anschlagspunkte auf Nutzfahrzeuge → DIN-EN 12842: Nutzfahrzeugebauteile Code L Anhang A und B → DE-RL 8.5: Ladegutsicherung mit DAIMLER-Ladungsträgern → § 22 BGV D 26: UVV-Vorschriften für Nutzfahrzeugebauteilen → ADR / GGVS: Vorschriften zum Straßengütertransport von Gefahrstoffen 		
<p>3. NWE - Planenspezifikation Fix-Road vom 12.04.2006:</p>		
<p>Zurplane: Fix-Road - Zurplane als zusätzliches Ladegutsicherungsmitel zur kraft- und formschlüssigen Sicherung von losen Transportgütern, als homogene wie beispielsweise Papierrollen und nicht homogene Ladeneinheiten wie beispielsweise paketierte Getränkekisten, bis zu 2.500 kg dAN je Polyesterzurzurung.</p>		
<p>Abmessungen: Abmessungen individuell nach Anwendungsfall</p>		
<p>Material-Güte: Extrem reißfestes- und kunststoffbeschichtetes Spezialgewebe</p>		

DEKRA Automobil GmbH		2 von 2
Niederlassung Bielefeld FB: Fahrzeugtechnik / Verkehrsurlaufanalyse / Ladegutsicherung		
Otto - Brenner, Str. 168 D-33804 Bielefeld Tel.: +49 / 521 / 2 99 05 - 28 Fax: - 70		
E-Mail: matthias.stenau@dekra.com		
DEKRA-Zertifikat 313 / 1106 YF. 1804132209 für die Übereinstimmung der NWE-Ladegutsicherungspläne vom Typ Fix-Road als zusätzliches Ladegutsicherungsmitel nach den anerkannten Richtlinien und Regeln der Technik zur Ladegutsicherung:		
3. NWE - Planenspezifikation Fix-Road vom 12.04.2006:		
Prüfung:	Dynamische Fahrversuchssachen B10/6/4/12.1 - 3 vom 12.04.2006	
Zug- Druckprüfung in X-Y-Richtung, gemäß DEKRA-Anforderungsprüfung®		
Fertigung:	Die Herstellung, Verarbeitung und Instandsetzung ist als normgerechte Konstruktion nach NWE - Herstellervorgaben anerkannt.	
Hinweise und Auflagen:	<p>Verwendung der Zulassung darf ausschließlich auf dieser Zertifikat nur für die vorgesehene und zertifizierte Bauform und Ausführung gilt. Sie erlaubt nach Inkrafttreten neuer gesetzlicher Bestimmungen oder Änderungen wesentlicher Bestandteile der NWE-Zulassungssysteme vom 12.04.2006. Das zertifizierte NWE-Ladegutsicherungssystem der hier in Rede stehenden Fix-Road - Zulassungen, ist analog zur Richtlinie VDI 2700 ff. und Norm DIN-EN 12195 in regelmäßigen Abständen spätestens jedoch alle 12 Monate durch einen DEKRA-Prüfer zu überprüfen. Der Zeitraum der Fahrzeughauptuntersuchung gemäß § 29 StVZO einer Überprüfung durch den Hersteller oder durch ihn autorisierte Personen zu untersagen. Instandsetzungen und Veränderungen sind nur durch den Hersteller oder durch ihn autorisierte Betriebe zulässig.</p>	
 		
Musterladegut palettierte Getränkekisten		Musterladegut Papierrollen
Der DEKRA-Sachverständige: 		
Dipl.-Ing. Mathias STENAU 		Hersteller / Anwender:              
Datum / Stempel / Unterschrift:       		



NWE NETWORK ENGINEERING OY AB
Uppstutåget 2
FIN-64200 Närpes, FINLAND

VAT: FI 09628099
Tel: + 358 622 50 114
www.nwe.fi info@nwe.fi