



**Economic and Social
Council**

Distr.
GENERAL

TRANS/WP.30/2002/27
23 August 2002

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on Customs Questions

affecting Transport

(One-hundred-and-second session, 22-25 October 2002,
agenda item 6 (c) (vi))

**CUSTOMS CONVENTION ON THE INTERNATIONAL TRANSPORT
OF GOODS UNDER COVER OF TIR CARNETS (TIR CONVENTION 1975)**

Application of the Convention

Amendment proposals relating to technical provisions

Cable with fibre-optic protection

Transmitted by Adeptum

Note* : The secretariat reproduces below a communication transmitted by the private company
Adeptum, Hungary.

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* Mention of firm names and commercial products does not imply endorsement by the United Nations.

A. BACKGROUND

1. The cable, which leads through all the hooks of the load compartment alongside the vehicle, is intended to fix the plastic sheet of the load compartment, and by sealing the two cable endings with any official customs seal, to provide integrity and avoid unauthorized access to the load compartment.
2. In case of a “traditional” TIR cable it is practically impossible to check the integrity of the cable in its full length (standard length 34 m). The official customs supervision is just to check the customs seal, which is fixed at the 2 cable endings. The integrity of the seal does not necessarily exclude the tampering with the cable and therefore unauthorized access to the content of the load compartment.

B. CABLE WITH FIBRE-OPTIC PROTECTION

3. The cable with integrated fibre-optic, being fully compatible with the “traditional” type in dimension and strength, offers a completely different security level. Fibre-optic lines are running inside the cable, within the full length of the cable (including cable endings). The integrity of the cable can easily be established with a simple light input (electric torch).
4. Should the cable be cut or tampered with at any point, the light output at the cable ending indicates the attempt. Due to its features, cutting or tampering the cable launches an irreversible process, where there is no possibility to restore the original condition, i.e. the same light transmission capability of the cable.

i. Application of the cable with fibre-optic protection

5. The construction of the cable endings of the fibre-optic cable allows the application of seals currently accepted and used by Customs authorities.
6. The method of checking the integrity is very simple: light input (electric torch) directed into the optic lens at the cable endings clearly indicates the status of the cable
 - Should the control window be GREEN, the cable is not tampered with.
 - Should the control window remain DARK, the cable is tampered with, i.e. cut through and no light is getting through the system.
 - Should the control window indicate RED and GREEN at the same time, the cable is cut and re-joined.

ii. Advantages offered by the fibre-optic cable

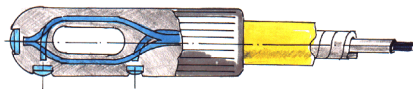
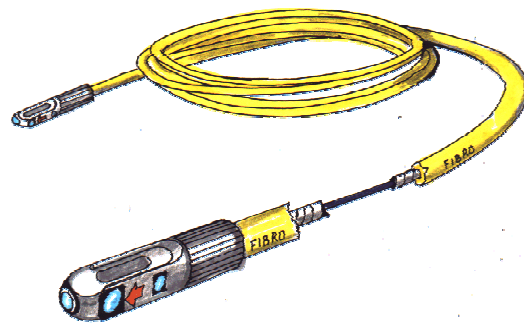
7. Advantages for Customs Authorities, TIR Carnet holders, shipping companies and forwarders all over Europe:

- The high-security fibre-optic cable can be used with the same approved seals and procedure as now, at no extra cost for Customs authorities.
- The control of the load compartment to reveal any unauthorized access or pilferage is becoming faster and much more reliable.
- The time dedicated for the control of a vehicle at the border is reduced dramatically. Less time must be dedicated to the control of the vehicle with much higher efficiency; waiting time for the trucks and drivers are getting shorter and more trucks are passing in less time.
- By the application of this special cable TIR Carnet holders, forwarders and shipping companies face less problems with pilferage, smuggling or illegal human traffic.
- The fibre-optic cable connected with GPS can provide continuous and on-line information on the status of the load compartment.
- The use of the fibre-optic cable could facilitate the co-operation between operators and Customs authorities.
- Moreover, besides its direct advantages, the use of the cable could have a positive impact on:
 - the reduction of environmental pollution (shorter waiting time, engines are running for shorter periods, less fuel is used up),
 - the reduction of freight costs.

iii. Functioning of the fibre-optic cable

8. The purpose of the fibre-optic cable is to fix and at the same time to secure the content of load compartments and railway wagons against theft and pilferage.

9. The cable itself is made up of spirally wound steel with a transparent plastic cover, having an outer diameter of 8 mm. Fibre-optic lines are placed within the housing in the full length of the cable. The cable is flexible and strong enough, cut to size, meets the requirements of such an environment.



10. The cable is closed with special endings, having 5 x 13 mm apertures on them, that can accommodate practically any kind of general use plastic or metal seals.

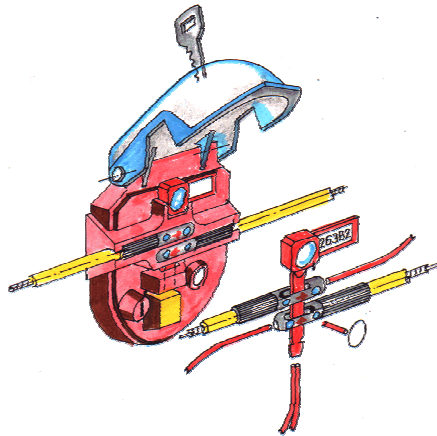
11. There are 3 integrated optic lenses at each cable ending, connected to the fibre-optic lines running within the housing in the full length of the cable. Since the fibre-optic lines are running in the full length of the cable to the very end of the cable endings, there is not a possible place where it could be cut through to provide unauthorized access to the content of the load compartment without damaging the fibre-optic lines. Fibre-optic lines are divided into 3 batches:

- to check the integrity
- special neutral line protection
- for GPS connection

iv. **Application of the fibre optic cable with Global Positioning System (GPS)**

12. More and more trucks are equipped with state-of-the-art GPS systems. These systems establish on-line communication between the truck and any surveillance center (police, forwarding agent), providing a continuous data supply regarding the current position of the truck.

13. The application of the fibre-optic cable allows for a possible connection of the cable with a GPS system.



14. Positioning of the cable endings is ensured by a special housing installed at the back of the load compartment. Light impulses are let through the cable continuously. Should the cable be damaged or cut, the light impulse is not any more received by the optic sensor of the electronic unit, which immediately triggers the alarm at the surveillance center.

v. **Technical features of the fibre-optic cable**

Type: TIR-S-01

Cable diameter: 8 mm

Cable length: 34 m

Cable construction: fibre-optic lines, steel housing (spirally wound), transparent plastic cover.

Cable endings: steel housing with integrated optic lens

Temperature range: between -30 to + 100 C
