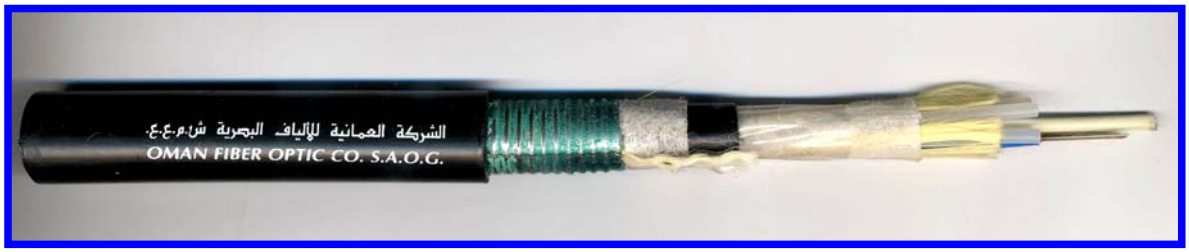
# OMAN FIBER OPTIC, S.A.O.G.

# General Guidelines for Transportation, Handling & Storage of Optical Fiber Cables

*Version 4, 14 Sept 2009*

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## PURPOSE & SCOPE

This document supercedes previous transportation, handling and storage guidelines published by Oman Fiber Optic Co. S.A.O.G. (OFO).

The purpose of this document is to provide general guidelines for transportation, handling & storage of optical cables, and applies to all types of terrestrial and aerial cables manufactured by OFO.

Because it is impractical to cover all potential situations in the field and warehouse this document is not intended to be an exhaustive description of optical cable transportation, handling or storage techniques. Rather, this document is intended to highlight the main concepts that are important to *prevent transportation, handling & storage related cable damage and/or degradation of optical cable performance.* This document is not intended to supersede local practices, codes, laws or regulations.

As an additional preventive measure, Oman Fiber Optic Company (OFO) strongly recommends that the end user contact OFO with any cable transportation, handling & storage related questions, if any.

## SAFETY ISSUES

There are a number of key safety issues that are important to keep in mind while handling optical cables supplied by OFO or other supplier.

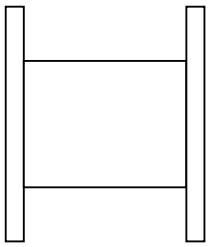
- ✓ The Purchaser is expected to take responsibility for Health, Safety and Environment (HSE) once the cable drums are received at specified delivery location. The Purchaser will also ensure that the HSE policy is widely disseminated and understood among employees and subcontractors employees
- ✓ The storage areas and work facilities shall be designed, provided and constructed such that they are safe and fit for use.
- ✓ Fire and safety regulations & laws are to be adhered to in cable storage areas. Local fire codes must be consulted before warehousing of cables.
- ✓ All local government and end user regulations must be followed at all times.
- ✓ Cables being provided in circular drums are susceptible to roll over. Hence cables when being transported or stored in inclined surface could cause physical injury.
- ✓ Cables are generally provided in wooden drums. There is hence a fire hazard
- ✓ When stored in harsh desert / high heat environments, long term storage (4 weeks+) has to be in covered areas.
- ✓ Extended water logging will cause damage to cable reels, and to cables in reeling off the drums thereafter.

# TRANSPORTATION & HANDLING OF FIBER CABLE DRUMS

The cable must be treated with care and precautions taken to prevent moisture entry and physical damage to the outer sheath and inner components.

OFO cables are normally supplied on wooden drums. These drums must be handled properly to assure optimum payoff control of the cable. At the time of taking delivery or receiving cable in warehouse / work site inspect the condition of the drum. If there is any evidence of drum damage, the damage must be repaired prior to storage / installation to avoid damage or over-tensioning of the cable. Special attention must be paid to ensure there are no protruding nails or other sharp objects that can damage the cable sheath during usage.

Do not lay drums on their side during transportation, storage or installation.



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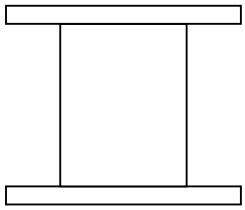

Not acceptable!

Cable drums weighing over 200 kg gross should only be handled through single point lift by forklift, trucks and cranes using wire rope slings. It is necessary to ensure that proper slings, shackles and other lifting devices are available whenever cables are being handled.

When drums are moved by rolling, the direction of roll shall comply with the drum rotation markings.

Rolling of cables or transportation by physical roll over long distances could cause winding tension release of cable reels and subsequent entanglement during cable installation. Therefore rolling of cable drums over long distances and uneven surfaces is to be avoided as far as possible.

Cables are to be transported in vehicles with rated capacity to handle the cable gross weight.

Cables are to be properly secured while transporting either by sling ropes through arbor holes and / or by preventing roll back through blocks.

Hazardous material shall be identified and are not to be transported along with fiber cables.

When lifting the drum from above with a crane or other lifting device, a **spreader bar** must be used above the drum to prevent inward pressure on the top of the drum flanges. The proper technique is shown in the photo below.

All movement of the FOC drums shall be monitored to ensure that no mechanical damage occurs during, on or while loading. Suitable equipment shall be available on site for off loading, lifting and moving large and heavy cable drums.

When using a forklift to load and transport cables, the drum slats shall not be used as the load-bearing portion. Cable drums shall be picked up from the side.

If damage to the drum and FOC is observed during transportation or handling, a complete OTDR drum retest for that particular drum shall be completed. If physical damage occurs on the outer loops of the cable on the drum, this short portion may be un-drummed, cut off and discarded.

# STORAGE OF FIBER CABLE DRUMS

The FOC shall be stored in a suitable location until required for use. Due consideration shall be given to security and environmental conditions. Extended storage periods (4 weeks+) calls for storage of cables away from direct sunlight. Water logging will cause damage to cable reels, and to the cables thereafter as they are reeled off the cable drums. Hence, storage should be in such location that water logging is clearly avoided.

The FOC shall not be unpacked until required for drum testing prior to installation. For routine testing and records, the 2-3 meter cable bottom end provided for the purpose is to be used for cable testing (routed through the cable flange). Drum slats are not to be removed until the cable is ready for installation.

The end of the cables is sealed to prevent ingress of moisture and contaminants. These are not to be removed until cables are being installed.

For long term storage of cable drums, it is not advisable to expose the drum to direct sunlight or excessive levels of moisture. Cables must also not be subjected to long term exposure to sand and fine particle dust storms, sand laden winds, thunderstorms, heavy rain and chemical contaminants. Accordingly, storage in closed & protected premises is advised.

Drums are not to be laid flat.

Weatherproof liners provided over cable drums are not to be removed until installation.

Before transporting to field, a physical inspection is to be carried out to ascertain whether there is any evidence of damage. Damage if any is to be notified to us for possible remedial action prior to transportation.

The drum number provided by OFO on the cable reel is a unique identification tag which facilitates tracking and is a reference for any communication related to the said cable reel. Hence, care must be exercised to ensure that the reel number information provided on the cable drum is retained at all times until cable installation.

In warehouses where rodent and termite attacks are likely frequent inspection of cable drum condition is to be carried out for early detection of damage.

Truncation of cable reel lengths in warehouse should only be done when proper prop up is available with rated capacity to handle cable gross weight. Cable ends are to be sealed thereafter to prevent moisture ingress.

Stacking of cable reels is not an acceptable practice.

## PERIODIC MONITORING OF CABLE CONDITION

OFO recommends detailed records are kept of warehoused cable drums in a different location.

OFO further recommends a cable-monitoring scheme to identify problems at warehouse owing to natural calamities, water seepage, attack by rodents and other contaminations. Typical cable-monitoring schemes include a periodic physical inspection of drum condition, quick reporting of damage to cable drums, and OTDR testing of cable reels found to be damaged.

## PROPRIETARY INFORMATION STATEMENT & WAIVER

The information in this document is proprietary to OFO. No one shall copy, distribute or loan this document except with written permission of an officer of OFO. This statement applies to both distribution on paper or distribution via electronic means.

This document is provided on a best effort basis and no guarantees are made or implied herein. OFO will not accept responsibility for decisions made in cable handling, transportation and storage based on the use of this document.

Further without cost to OFO, the user of our products is expected to take all necessary precautions to protect the public and minimize the disturbance and inconvenience to the public resulting from cable transportation, storage and deployment related work. The cable installer shall comply with all Governmental regulations as to the placing of traffic signals, flares, barricades, flags and other warning signs during the performance of the work, including transportation of cables in populated areas.

The cable installer is also recommended to take cognizance of all environmental issues and comply with laws, by-laws, rules and regulations related to the environment. This shall include but not be limited to avoiding unnecessary felling or damaging of trees, emission of noise & fumes, dust control, proper discharge of effluents, and proper handling of waste and toxic substances in the course of transporting, handling and installing fiber cables.

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