Safety Instructions for Handling Spools with a Risk of Spring Effect

Introduction:

Handling practices for carbon composite spools or reels must take into account that all spools have some degree of spring effect, i.e. the wound material tends to become (almost) flat, so the spool unwinds if it is not held. Unwrapping or removing fasteners can therefore be potentially dangerous. Products identified as having a risk of spring effect should be handled with care. Failure to observe the safety instructions may result in physical injury caused by the spring effect of the rod or laminate end as the spools or reels unwind.

Definition of the Spring Effect

The level of danger represented by a spool/reel is proportional to the energy accumulated in the outer turns of the spool during winding. The risk increases with: increasing thickness; increasing width; decreasing spool diameter. When the energy stored in a spring effect spool is released, the outer turn spins back over and around it, hitting anything in its path with a force that can be very powerful.

Handling Spools or Reels:

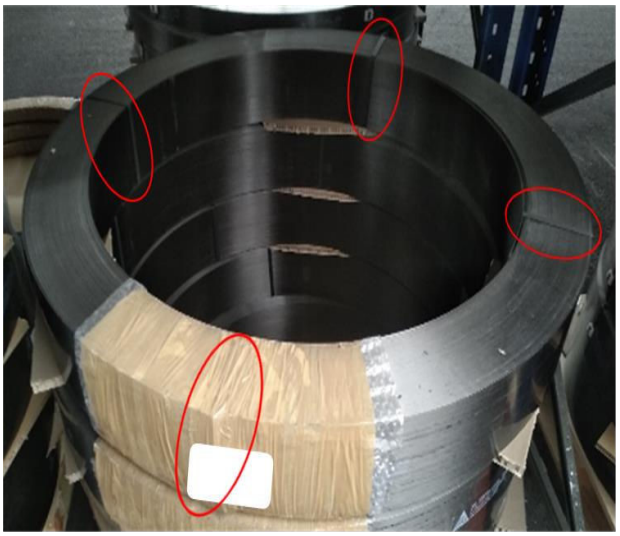
1. Personal Protection:

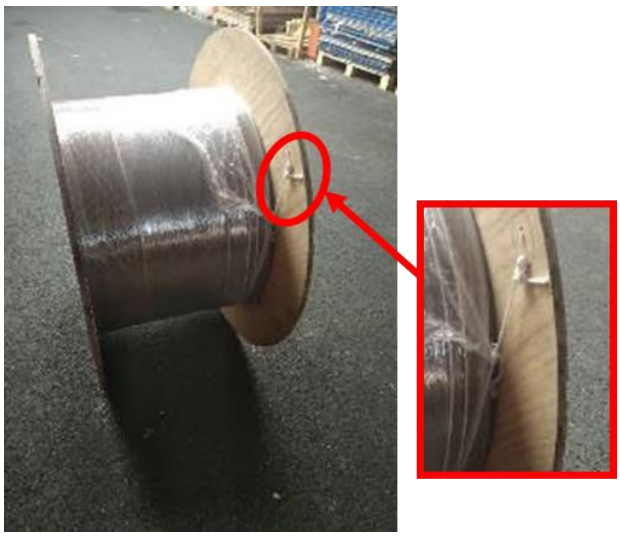
The operator handling, unpacking or discharging the product must wear suitable personal protective equipment:



2. Safety Instructions before Handling:

- Before unpacking the spool, ensure that all the fasteners or restraining cables are fitted.
- Never stand facing the winding or unwinding direction of the spool during handling.





Spool Unwinding:

The spool must be held vertically to prevent the spring effect or sudden unwinding, and the product end should be positioned at the lower part (cf. Figure 1 below).

Using suitable equipment (mandrel, securing bars) for continuous holding during the unwinding operations is strongly advised.

The fasteners should not be removed until the product is safely on the unwinding equipment.



Figure 1. Example of an unwinder for a reel



Figure 2. Example of an unwinder for a laminate spool

Return of Spools or Reels:

The spools or reels must be returned to Toray Carbon Fibers Europe under the same conditions as the delivery. The fasteners or restraining cables must be fitted. The spring effect risk must be indicated clearly on the final packaging.