



# Schöck Combar®

## Handling and Safety Instructions

**Please read carefully!**

### I. General

Some aspects of the behaviour of Combar® bars differ from those of steel rebars. The unique material properties of Combar® mandate a treatment different from that of normal steel rebar.

### II. Handling

#### 1. Shipping and storage

- 1.1. Combar® can be damaged by forceful mechanical blows. Prior to shipment and handling Combar® bars shall be packed in such a way that they are protected against mechanical blows caused by forklifts or hoisting equipment. Combar® bars shall never be placed on sharp surfaces. Objects with sharp edges shall not be placed directly onto Combar® bars.
- 1.2. Combar® end heads can be damaged by mechanical blows. Prior to shipping, reinforcing bars with end heads shall be secured in such a way that the heads can not be damaged. Bars with headed ends shall be packed and secured in such a way that the heavier bar

ends do not cause the bars to vibrate. Combar® bars with end heads shall not be dropped vertically/headfirst onto hard surfaces.

- 1.3. Combar® bars are very elastic. To avoid excessive deflections of the bars appropriate hoisting equipment is to be used at all times.
- 1.4 Combar® may be damaged by abrasive forces. Individual Combar® bars shall not be pulled out of packages of bars. Combar® bars shall not be dragged across the ground or across sharp edges.
- 1.5. Combar® is not permanently resistant to UV-rays. When Combar® bars are to be stored for longer periods of time (> 4 weeks) they shall be protected against rain and direct sunlight. They should be stored in a dry environment. Combar® bars are to be stored at temperatures between -20 °C and +40 °C.
- 1.6. The bond between Combar® bars and concrete may not be impaired. Like steel reinforcing bars, Combar® bars shall be kept clean, free of oils, grease and other contaminants at all times.

## 2. Handling

- 2.1 Combar® bars are made of glass fibres. Like wood, the ends of the bars can burr when they are cut using inappropriate tools. Combar® bars shall be cut using a steel saw, a band saw or a grinder with a diamond or hard metal blade. Combar® bars shall not be cut using bolt cutters or drop shears. If required, burrs at the ends of the bars can be removed using a file or a rasp.
- 2.2 Combar® bars can be damaged by forceful mechanical blows. Combar® shall not be subjected to mechanical blows (hammer or sharp objects).
- 2.3 Combar® can not be welded. Combar® bars can be connected using conventional tying wire. Alternatively, plastic cable ties can be used. Plastic bar clips are available at Schöck for the perpendicular connection of 8 mm to 8 mm and 12 mm to 12 mm bars.
- 2.4 Combar® behaves linearly elastic until failure. In contrast to steel bars, Combar® bars can not be bent permanently (plastically). They can be bent elastically. However, they have to be held in position after bending. CAUTION: When released, elastically bent bars will snap back into their original straight shape! Stirrups and bent Combar® bars are produced at the factory and delivered to the bending shop or the construction site.

## 3. Installation, Pouring concrete

- 3.1 Dirt, oils and other contaminants inhibit the bond between the bars and the surrounding concrete. Like steel reinforcement, Combar® bars shall be kept free of dirt, oils and other contaminants at all times. Dirt and

contaminants which could inhibit the bond to the concrete are to be removed prior to pouring of the concrete (high pressure cleaner - only after consultation with Schöck).

- 3.2 Combar® is lighter than steel. Combar® bars have to be secured in place prior to pouring concrete, to be sure that they do not rise to the concrete surface.
- 3.3 The exact location of the reinforcing bars within a concrete member is important. Bar spacers used with steel rebar can be used with GFRP rebar.

## 4. Fire resistance

- 4.1 Combar® is slightly flammable, but does not burn. Combar® bars shall be protected against sparks, open flames and excessive heat at all times.
- 4.2 Combar® bars melt at high temperatures. Combar® bars shall not be subjected to temperatures above 40 °C for longer periods of time (> 4 weeks). Peak temperatures of 65°C are permissible.

## III. Safety

### 1. General

- 1.1 Working at the bending shop or on site can be dangerous. Generally, gloves should be worn when working with reinforcing bars such as Combar®.
- 1.2 Inhaling any type of saw or filing dust is not healthy. When cutting Combar® bars a mask and safety goggles should be worn.
- 1.3 Combar® has been certified to be non hazardous. It is categorized as Z0 by the German LAGA (state consortium on waste management).