

# Technical information

## CE MARKING

Some of our products can be used as lifting accessories and as such bear the CE marking (awarded under the auto-certification scheme in accordance with the Machines Directive 2006/42).

Each product displays the following information

- Working Load Limit (WLL)
- CE marking, product origin, manufacturer's logo
- Materials
- Manufacturing batch serial number



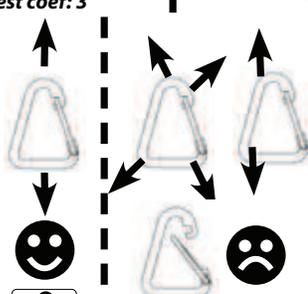
### Reading guide for CE labels on Wichard products

Réf: 2345 **CE**  
**INOX STAINLESS STEEL**  
Made in France

**MOUSQUETON DELTA  
DELTA HOOK**  
Ø: 8 mm - 5/16 in.

 <b>Industrie</b> Industry	 <b>Nautisme</b> Boating
<b>CMU - WLL</b> (Charge max. utilisation - Working load limit) <b>240 Kg - 530 Lbs</b>	<b>CT - WL</b> (Charge travail - Working load) <b>720 Kg - 1590 Lbs</b>

**Facteur sécurité: 5**  
**Safety factor: 5**  
**Test coef: 3**

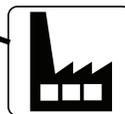


 [wichard.com](http://wichard.com)

Products marked and sold in shops come with a notice in the form of a label that indicates the working load limit (WLL) to be applied in an industrial situation (lifting, etc.) and the working load (WL) to be applied in nautical situations.



Working Load (WL): for nautical applications.



Working Load Limit (WLL): for industrial applications only.

The safety factor is 5 times the breaking load.

$WLL = \text{Breaking load} / 5$

# Technical information

## WARRANTY

All Wichard products are warranted to be free of defects in materials or workmanship for five (5) years from the date of purchase by the original end-user. Excluded from this warranty are:

- > Any product which has been improperly fitted.
- > Any product which has been improperly used or used in any application for which it was not intended.
- > Any product which has been improperly maintained.
- > Any product modified without a written approval from Wichard.
- > Any damage being a consequence from alteration, from ultraviolet light exposure or from the normal wear of products.

The useful life of any products is determined by its utilisation and an appropriate factor of safety (see page 61). It must be distinctly assessed in each application. Thus no guarantee can be provided for product life, dynamic capacities or any other factor due to the variability in usage.

Wichard's liability is limited to the repair or replacement of the defective goods exclusive of any other repair. Responsibility and costs of handling, transportation and any custom duties and tariffs linked to the warranty claim are in any case borne by Wichard.

## CORROSION IN MARINE ENVIRONMENT

All Wichard products are passivated. Corrosion attacks stainless steel and is always visible in the form of black coloured roughness. Although this is dangerous, it is rarely seen in current use, except in cases where martensitic (HR) steel is in total, prolonged immersion. What many people erroneously call corrosion, is really rust, or oxidation. This is due to outside causes. In the marine environment, stainless steel is subject to considerable aggressive forces and is not totally corrosion free. Re-passivation can be accomplished with a passivator such as Wichinox (see page 55). All stainless steel products demand a minimum of upkeep.

## STAINLESS STEEL

Wichard uses top-quality grades of stainless steel in its products (see chart). The first type is a low carbon austenitic steel (316L), which offers good mechanical characteristics. They are non-magnetic steels and most of Wichard products are manufactured in this grade. The second (17.4PH) is martensitic steel (magnetic), which is referred to as high-resistance steel (HR).

<i>Type</i>	<i>Austenitic</i>	<i>Martensitic</i>
<b>Common name</b>	18.12 Mo	17.4 PH
<b>European Standard</b>	X2CrNiMo17-12-2	X5CrNiCuNb 16-4
<b>US AISI Standard</b>	316 L	630
<b>Composition Carbon</b>	< 0,03 %	< 0,07 %
<b>Chromium</b>	18 %	16,5 %
<b>Nickel</b>	12 %	4 %
<b>Molybdenum</b>	3 %	
<b>Copper</b>		4 %

## WHY A WICHARD SHACKLE?

A Wichard shackle is manufactured on a very old principal, forging. Wichard has perfected and machined this process down to the smallest detail.

## RELIABILITY AND HIGH QUALITY

After the raw metal bars are checked on chemical alloy and quality, the metal is heated to the right temperature to be forged. Then the metal is pressed in its new shape with great force by a hydraulic hammer. Due to this process the metal obtains an organized structure without any weakness. Because of this structure, called fibers, the metal object is not only very strong but also has an "elastic" property. Casted metal objects of the same design are less strong because the structure in the metal is not the same everywhere in the object. Next to this there is the chance that small air bubbles are enclosed during the casting. This causes a capital weakness in the casted object. Even objects machined from a block of metal can have weaknesses. Where the metal is machined into a curve the structure in the metal is broken and becomes a weak point in the object. When the object is overloaded it will break at this point.

## PERFORMANCE AND SECURITY

Due to the technique of forging every object of the same design and shape has the same properties with a small tolerance of deviation. By controlling all important factors Wichard can guarantee an accurate breaking load and working load for each individual object. Wichard advises to respect carefully the Working Load (WL) indicated for each of its products. If a Wichard product is overloaded between the safe working load and breaking load the product will deform due to its "elastic" property. This gives the user an extra safety margin and shows when the product is overloaded. Deformed parts have to be replaced immediately preferably by a part in a larger size.

## DEFINITIONS

Working Load (WL) indicates the value of static load at which the product will still function without excessive friction or wear or permanent deformation of components.

Breaking Load (BL) indicates the value of static load for which a major failure of one or some structural components or the complete destruction of the product can be expected when new. Plastic components may split, rivets may give way, shackles or any other connection parts break and other metallic components may fracture.

## UNITS OF LOAD

Our resistance values are shown in kilogramme-force (symbol: kgf or more usually kg), which is the force due to gravity sustained by a mass of 1 kg situated at the latitude of Paris. This unit of force is obsolete, and is not part of the SI international system of units, which links concepts of mass and weight. The unit of force used in the SI system is the Newton (N).

To pass from the kilogramme-force to the Newton its value must be multiplied by  $g$ , the acceleration of gravity, which is  $9.80665 \text{ m/sec}^2$  at the latitude of Paris, or  $9.80665 \text{ N} (\text{N} = \text{kg} \times \text{m} \times \text{s}^{-2})$ . In the fields where the kgf appears we should now use the decanewton (or dekanewton), daN:  $1 \text{ kgf} = 9.80665 \text{ N} = 0.980665 \text{ daN}$  ( $1 \text{ daN} = 1.019716 \text{ kgf}$ ).

Our test equipment measures loads in daN, but bowing to custom and for reasons of simplicity and safety, we still give values in kgs in our brochures and on our products. Our measured values have simply been converted into kgs.

## FACTOR OF SAFETY

Before choosing or specifying a particular product, an appropriate factor of safety should be applied to Breaking Loads (BL) to suit each application.

For many industrial and safety applications, and for some yachting application, a factor of safety greater than two (2) should be used or may be required by law or other regulations. It is the customer's responsibility to ensure that an appropriate factor of safety is used, and it should take into account safety implications, service life, fatigue (as may be caused by wave action, wind stress or repetitive cyclical loading), type of load, exposure to ultraviolet light, corrosion and stress corrosion (such as in high humidity or high chlorine environment). Even more attention is required when specifying blocks as other factors have to be taken into account such as rotary speed, deflection angle of the rope or the number of wire of the tackle (see page 31 of the present document). Note that a "Safe Working Load" is not specified as this is dependent on the factor of safety, which must be determined by the user relative to each application.

**IN ANY CASE, NEVER USE THE PRODUCTS OVER THE WORKING LOAD !**

## USEFUL LIFE

The useful life of any products is determined by the above factors and must be assessed in each application. Thus no guarantee can be provided for product life, dynamic capacities or any other factor due to the variability in usage. In some jurisdictions government regulations require the replacement of rigging components within certain periods of time, usually after three or five years. You must ascertain whether any such regulations affect you and take appropriate steps if you are affected.

## MAINTENANCE AND INSPECTION

All your marine hardware, blocks and equipments must receive regular inspections to prevent any deformation, wear, cracks or corrosion. Even if your products have had little use, ultraviolet light exposure, wave action, humid or saline environment may cause damage that could affect quality or strength of the equipment. If, after inspection, you are in doubt about the integrity of one of some parts,

it is the customer's responsibility to replace the defective components or product to ensure his own safety.

While every precaution is taken in the product design and manufacturing processes of our products to minimize the effects of corrosion or stress corrosion, appropriate preventive or corrective treatments must be carried out to the products after installation.

