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1. **Manufacturer**
The Products are manufactured by Crosby Europe in 4 European facilities:

- **Crosby Premier Stampings**
  Station Street, Cradley Heath, B64 6AJ UK

- **Crosby Zimmermann**
  18 Rue du Général Rascas, 57220 Boulay, France

- **Crosby IP Ede**
  Celsiusstraat 51, 6716 BZ Ede, Netherlands

- **Crosby Belgium**
  Leuvensebaan 51, 2580 Putte, Belgium

2. **Compliance**

2.1. **Certified to**
All Products are Certified to NS9415

2.2. **Certifying Body**
DNV GL are the Certifying Body

2.3. **Certificate numbers**
The following certificates issued by DNV GL refer
- Prono 091.01 – Shackles
- Prono 091.02 – Connecting Elements
- Prono 091.03 – Reserved for future use
- Prono 091.04 – Anchor Chain

3. **Product**
The aquaculture range consist of following Product groups:
- Shackles
- Connecting Elements
- Bolts
- Anchor Chains

Additional product groups can be added in the future

3.1. **Shackles**
The Crosby range of Aquaculture shackles consists of 4 types of shackles.

*Trawllex Aquaculture Shackles should not be used in GENERAL lifting operations.*

*For specific applications, please contact Crosby.*
3.1.1. **TXMS Trawlex Mooring Shackle**

4-part Shackle consisting of a body manufactured using the closed die forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined and galvanised.

Bolt manufactured by up-ended forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined, galvanised and red painted (Crosby trade mark). Double Protection is provided by the nut & cotter pin. The cotter pin can be replaced by a round plastic click ring.

3.1.2. **TXBS Trawlex Bow Shackle**

3-part Shackle consisting of a body manufactured using the closed die forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined and galvanised.

Bolt manufactured by up-ended forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined, galvanised and red painted (Crosby trade mark). High visibility plastic plug provides double locking.

3.1.3. **TXDS Trawlex D Shackle**

3-part Shackle consisting of a body manufactured using the closed die forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined and galvanised.

Bolt manufactured by up-ended forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined, galvanised and red painted (Crosby trade mark). High visibility plastic plug provides double locking.

3.1.4 **G2130 OC Bolt-type Shackle**

4-part Shackle consisting of a body manufactured using the closed die forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined and galvanised.

Bolt manufactured by up-ended forging method. High grade steel is used. After forging the body is shot blast, heat treated, machined, galvanised and red painted (Crosby trade mark). Nut & Cotter Pin provides double-locking as standard.

3.2. **Connecting Elements**

The Crosby range of Aquaculture Connecting Elements consists of 3 types of products.
3.2.1. **TXCP Trawlex Connection Plate**
Manufactured out of high Grade steel. After manufacturing the body is shot blast, heat treated and galvanised. Zinc anodes are added.

3.2.2. **TXA344 Galvanised Master Link**
High grade steel is used. After forming and welding the master link is shot blast, heat treated and galvanised.

3.2.3. **TL_N Trawlex Connector**
4-part connector consisting of:
2 x ½ bodies manufactured using closed die forging.
High grade steel is used. After forging the body is shot blast, heat treated, machined and zinc passivated.
Pin & bush completes the product.

3.3. **Bolts**
Information will be updated once in production.

3.4. **Anchor Chains**
Trawlex Anchor Chains should not be used in GENERAL lifting operations.
For specific applications, please contact Crosby.
The Crosby range of Aquaculture Anchor Chains consists of 2 types of products:

3.4.1. **Trawlex Mid Link Chain**
Trawlex chain is double heat-treated for added corrosion and stress-relief protection.
Chains in 16mm & 19mm dimension are also available in a Profile finish. This means the possibility for the chains to wear is vastly reduced, giving a better usage in real life.

3.4.2. **Trawlex Long Link Chain**
Trawlex chain is double heat-treated for added corrosion and stress-relief protection.
Chains in 16mm & 19mm dimension are also available in a Profile finish. This means the possibility for the chains to wear is vastly reduced, giving a better usage in real life.

4. **Traceability**
Traceability on our products is described below.

4.1. **Shackles**
Every load bearing part is fully traceable by a 3-digit Product Identification Code (PIC) forged into the Product.
The Manufacturer is identified by the addition of CG on the product.
4.2. Connecting Elements

4.2.1. TXCP Trawlex Connection Plate
Traceability is achieved by applying a PIC to the main body.
The Manufacturer is identified by the addition of CG and the FISH logo on the body.
The Product name and MBL is also noted on the body.

4.2.2. TXA344 Galvanised Master Link
Traceability is achieved by stamping a PIC onto the side of the Master Link.
The Manufacturer is identified by the addition of CG on the body.

4.2.3. TL_N Trawlex Connector
Each forged part is marked with a PIC during forging.
The Product name and the FISH logo are also noted on the body.

4.3. Bolts
Information will be updated once in production.

4.4. Anchor Chains
Trawlex chain is as a minimum marked with a single digit fish logo. Contact Crosby for details of other markings that may be present.

5. Transportation & Storage

5.1. Shackles

5.1.1. TXMS Trawlex Mooring Shackle
All Shackles are supplied by the Manufacturer with the bolt & nut fitted. Cotter pins are supplied, but packed separately. No special packaging or permit is required for transportation; however, steel drums or wooden boxes are preferable. They are fully galvanized, so no special storage instructions are required, however, it is recommended they are kept in a dry location until used.

5.1.2. TXBS Trawlex Bow Shackle
These Shackles are supplied with the bolt fitted, with the double-protection plug supplied, packed separately. No special packaging or permit is required for transportation; however, steel drums or wooden boxes are preferable. They are fully galvanized, so no special storage instructions are required, however, it is recommended they are kept in a dry location until used.

5.1.3. TXDS D Shackle
These Shackles are supplied with the bolt fitted, with the double-protection plug supplied, packed separately. No special packaging or permit is required for transportation; however, steel drums or wooden boxes are preferable. They are fully galvanized, so no special storage instructions are required, however, it is recommended they are kept in a dry location until used.
5.1.4 **G2130 OC Bolt-type Shackle**
These Shackles are supplied with the bolt and nut fitted, with the cotter pin packed separately. No special packaging or permit is required for transportation; however, steel drums or wooden boxes are preferable.

They are fully galvanized, so no special storage instructions are required, however, it is recommended they are kept in a dry location until used.

5.2. **Connecting Elements**

5.2.1. **TXCP Trawlex Connection Plate**
These are supplied with the zinc anodes fitted to the plate. No special packaging or permit is required for transportation; wooden boxes or pallets are preferable.

They are fully galvanized, so no special storage instructions are required, however, it is recommended they are kept in a dry location until used.

5.2.2. **TXA344 Galvanised Master Link**
As a self-contained item, no special packaging is provided. Steel drums or wooden boxes are a preferable method of transportation.

They are fully galvanized, so no special storage instructions are required, however, it is recommended they are kept in a dry location until used.

5.2.3. **TL_N Trawlex Connector**
These connectors are supplied with the pin assembled, and bagged individually with a bush in the pack. No special packaging or permit is required for transportation and because of the additional packing, they can be transported in cardboard boxes, however steel drums or wooden boxes are preferable.

The bodies are zinc passivated, so no special storage instructions are required, however, it is recommended they are kept in a dry location until used. Excessive exposure to a salt-laden atmosphere prior to use may result in surface corrosion on the bush.

5.3. **Bolts**
Information will be updated once in production

5.4. **Anchor Chains**

5.4.1. **Trawlex Mid Link Chain**
Mid Link chain is supplied oiled for added corrosion protection in either steel drums or wooden boxes. No special permit is required for transportation. It is recommended that Anchor Chain is kept dry and stored indoors to avoid surface rust forming.

5.4.2. **Trawlex Long Link Chain**
Mid Link chain is supplied oiled for added corrosion protection in either steel drums or wooden boxes. No special permit is required for transportation. It is recommended that Anchor Chain is kept dry and stored indoors to avoid surface rust forming.
6. Installation

In General
All persons installing Crosby Trawlex Aquaculture Chains & Components should be deemed to be a competent person. This competency should be demonstrated by
• Certificates from boat/vessel/ship
• Reference from other fish farms
• Documented knowledge and experience for this purpose
This manual only covers the equipment manufactured by Crosby – installation of other equipment may be covered by a separate user manual and this should be in your possession prior to the start of any installation.

6.1. Shackles

6.1.1. TXMS Mooring Shackle
All Mooring Shackles are 4-part Shackles. These 4 parts are Body, Bolt, Nut & Cotter Pin. Only original bodies, bolts, nuts & cotter pins are to be used. Ensure all parts are fitted soundly. All Shackles should be loaded in-line. Excessive side loading will reduce the capacity of a Shackle. A retro-fit Plastic Clip or Twisted Wire can be used.

6.1.2. TXBS Bow Shackle
All Bow Shackles are 3-part shackles. These 3 parts are Body, Bolt & Double Protection Plug. Only original bodies, bolts & plugs are to be used. Ensure all parts are fitted soundly. All Shackles should be loaded in-line. Excessive side loading will reduce the capacity of a Shackle.

6.1.3. TXDS D Shackle
All D Shackles are 3-part shackles. These 3 parts are Body, Bolt & Double Protection plug. Only original bodies, bolts & plugs are to be used. Ensure all parts are fitted soundly. All Shackles should be loaded in-line. Excessive side loading will reduce the capacity of a Shackle.

6.1.4 G2130 OC Bolt-type Shackle
All Bow Shackles are 4-part shackles. These 4 parts are Body, Bolt, Nut & Cotter Pin. Only original bodies, bolts, nuts & cotter pins are to be used. Ensure all parts are fitted soundly. All Shackles should be loaded in-line. Excessive side loading will reduce the capacity of a Shackle.

6.2. Connecting Elements

6.2.1. TXCP Trawlex Connection Plate
The Connection Plate is designed to have the mooring Shackles fitted with the bolt on
the upper side of the plate, and the nut & cotter pin to the bottom. A Fin on one side of
the Shackle is designed to stop the bolt from rotating when the nut is fitted, thus
enabling single person installation. Having the nut & cotter pin on the bottom gives extra
protection so the bolt cannot fall out if the nut & cotter is removed for any reason.
A lug is fitted at the centre of the top of the plate to allow connection to a buoy. This lug
should not be used to connect a mooring line to.

6.2.2. **TXA344 Galvanised Master Link**
Master Links should be connected to mooring lines by using a TL Connector or TXMS
mooring Shackle.
Master Links can be directly connection so soft slings.

6.2.3. **TL_N Trawlex Connector**
A TL_N Connector is fitted by inserting the pin through the 2 halves of the TL_N passing
through the bush which is held in the centre of the body. A hammer is best to be used
for this operation.

6.3. **Bolts**
Information will be updated once in production.

6.4. **Anchor Chains**
Trawlex Mid Link Chain & Trawlex Long Link Chain
Chains should be fitted into the mooring lines by using Shackles, Connectors or other
approved connection device. The chain should always be connected through the short
end (crown) of the chain link. It is not approved to connect into the long side of
the chain.

Care should be taken when unloading the chain that there is no side loading on the
chain. The chain is not approved for Lifting, so any anchor or other weight attached to
the chain should be supported until the chain is installed.
If cutting the chain, suitable heat-sinking should be used to prevent heat-transfer onto
neighbouring links as this would affect the heat-treatment of the chain.

7. **Inspection, Maintenance and Replacement**
All equipment should have a Certificate of Conformance as it’s ‘Birth Certificate’

7.1. **Shackles**
Shackles should be inspected in accordance to local legislation for the following:
• **Wear**
Material loss of greater than 10% is not allowed and any components demonstrating
this should be removed
• **Nuts & Double Protection**
Any missing Nuts or Cotter Pins should be replaced with original manufacturer parts
• **Corrosion**
  Shackles should be inspected for Corrosion and the Inspector should recognize the difference between Surface Corrosion and Deep Corrosion.

Shackles should be replaced every 10 years whether there is any of the above faults being demonstrated. They should only be replaced with parts certified to NS9415. A log should be maintained of parts replaced, whether the replacement is necessitated through annual inspection or periodic replacement.

### 7.2. Connecting Elements

#### 7.2.1. **TXCP Trawlex Connection Plate**
Connection Plates should be inspected according to local legislation for the following:

- **Wear**
  Material loss of greater than 10% is not allowed and any components demonstrating this should be removed.

- **Corrosion**
  The Connection Plate including Lug should be inspected for Corrosion and the Inspector should recognize the difference between Surface Corrosion and Deep Corrosion. The Connection Plates are fitted with Zinc Anodes for purpose of demonstrating when they need to be changed. When the Zinc Anode has been completely removed through corrosion it is time to replace the Connection Plate.

Connection Plates should be replaced every 10 years whether there is any of the above faults being demonstrated. They should only be replaced with parts certified to NS9415. A log should be maintained of parts replaced, whether the replacement is necessitated through annual inspection or periodic replacement.

#### 7.2.2. **TXA344 Galvanised Master Link**
Master Links should be inspected according to local legislation for the following:

- **Wear**
  Material loss of greater than 10% is not allowed and any components demonstrating this should be removed.

- **Corrosion**
  Master Links should be inspected for Corrosion and the Inspector should recognize the difference between Surface Corrosion and Deep Corrosion.

Master Links should be replaced every 10 years whether there is any of the above faults being demonstrated. They should only be replaced with parts certified to NS9415. A log should be maintained of parts replaced, whether the replacement is necessitated through annual inspection or periodic replacement.
7.2.3. **TL_N Trawlex Connector**

TL_N Connectors should be inspected every 12 months for the following:

- **Wear**
  Material loss of greater than 10% is not allowed and any components demonstrating this should be removed.

- **Pin & Bush**
  Any missing Pins or Bushes should be replaced with original manufacturer parts.

- **Corrosion**
  Connectors should be inspected for Corrosion and the Inspector should recognize the difference between Surface Corrosion and Deep Corrosion.

TL_N Connectors should be replaced every 10 years whether there is any of the above faults being demonstrated. They should only be replaced with parts certified to NS9415. A log should be maintained of parts replaced, whether the replacement is necessitated through annual inspection or periodic replacement.

7.3. **Bolts**

Information will be updated once in production.

7.4. **Anchor Chains**

Trawlex Mid Link & Long Link Chain

Chain should be inspected according to local legislation for the following:

- **Wear**
  Material loss of greater than 10% is not allowed and any Links demonstrating this should be removed.

- **Corrosion**
  Chain should also be inspected for Corrosion and the Inspector should recognize the difference between Surface Corrosion and Deep Corrosion.

Trawlex Chain should be replaced every 10 years whether there is any of the above faults being demonstrated. They should only be replaced with parts certified to NS9415. A log should be maintained of parts replaced, whether the replacement is necessitated through annual inspection or periodic replacement.