Quick Release Mooring Systems

Mampaey Offshore Industries, The Netherlands
Mampaey Offshore Industries is a leading supplier of mooring, berthing and towing systems, with safety and reliability as a shared value.

The company, based in the Netherlands, was founded in 1904. Mampaey Offshore Industries is a privately owned company, managed by the fourth generation. Started as a local blacksmith, the company evolved into a global active supplier that defined industry standards and is ISO 9001 quality approved. Mampaey has an outstanding reputation with regard to the quality of her products. A track record of 100 years learns that Mampaey products have a long life cycle combined with low operational costs. The latter is underscored by the low percentage of spare parts that contribute to Mampaey's total turnover.

The total cost of ownership makes every Mampaey product a solid investment.

Mampaey's in-house engineering and software development assures that all Mampaey products fulfill client's requirements. Integrated systems like iMoor are developed to make the total of Mampaey mooring products more attractive then the sum of its parts. The dynamic oval towing system for tugs is developed as a response to make assisting ships safer, especially at higher speeds. The alertness of Mampaey in searching for new solutions that could improve client's safety was recognized by being selected as the Netherlands' most innovative small and medium sized Enterprise for 2007.
Quick release mooring hooks

Since the 1950’s Mampaey is a supplier of quick release mooring hooks to the oil and gas industry. The Mampaey quick release mooring hooks are specially designed to improve the safety of ship handling operations. The hooks are specifically designed to release mooring lines with little effort, even under full load conditions. To reset the hook back into its working position a simple action is required. The standard mooring hooks are available from 40 up to and 200 Tons. Mooring units can be supplied into a single, double, triple, quadruple or sextuple hook configuration. The quick release hooks are compatible with all other iMoor components.

Advantages of Mampaey mooring hooks:

- Designed for low total costs of ownership.
- Mampaey mooring hooks are assembled out of steel plates.
- All Mampaey mooring hooks can be manually released at 100% of the safe working load with a minimum effort (max. 10 - 20 kgf.).
- All Mampaey mooring hooks are tested individually at 150% of the safe working load or otherwise agreed.
- Simple (one man) action to reset the hook.
- Mampaey mooring hooks are standard painted with ISO standard approved coating system.
- Hooks are free-swivelling ensuring fully spark-free operation.
- Hooks can be fully disassembled with standard hand tools.
- All moving parts can easily be greased.
- The mooring units can be installed onto concrete or steel deck structures.
- Hooks are designed to operate through 180 degrees horizontally and 45 degrees vertical.

In accordance with latest European norms Mampaey offers fully ATEX certified components throughout their product line range.
The Mampaey mooring hooks can be provided with several optional features, such as:

- Anti rope slip devices (keepers).
- Electrical insulation.
- Integral capstans.
- Remote control system.
- Mooring load monitoring system.
- Coal dust covers.
- Special coatings and/or hook designs for extreme aggressive atmospheres.
- Customized executions.

**Capstans**

Capstans can decrease the time required to moor a vessel and prevent the heavy lifting of mooring lines. Capstans are often supplied as an integral part of the hook package, however, some customers require separate or add-on units as part of a facility upgrade.

- Capstans are available certified for Zone 1 or Zone 2 or non-hazardous area.
- Capstans are designed to be maintenance free and are lubricated for life.
- Standard capstans incorporate 3 phase squirrel cage induction motor, being directly coupled to a planetary geared reducer to provide the required output torque and speed.
- Capstan is operated by a footswitch or pushbutton.
- Capstans can be equipped with a non-reversible or reversible type motor starter.
- Optionally the capstan can be equipped with a mechanical or electric braking device.
- Both single and dual speed capstans can be supplied either freestanding or integrally mounted to a large range of quick release hook units.

Examples executions of several Mampaey capstans:

- Special insulated capstans mounted into a pipe-construction for low temperature operation
- Freestanding capstan
Single hook assembly

MHC.000.401.000 = Mooring unit with capstan
MHX.000.401.000 = Mooring unit without capstan

Drawing number
Number of hooks: one
Mooring hook unit with a square or rectangular baseplate
Capacity each hook

EXPLANATION:
Cap. = Capacity mounting base in kN
Wt. = Weight in kilograms, excl. capstan
X. = Number ans size of HD bolts
S.W.L. = Working load in kN

Dimensions in millimeters

| Type  | MHC  | S.W.L. | Cap. | Wt.  | A   | B   | BB  | C   | D   | E   | EE  | F   | G   | H   | K   | R   | X   |
|-------|------|--------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 | 040.401 |
| 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 | 060.401 |
| 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 | 075.401 |
| 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 | 100.401 |
| 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 | 125.401 |
| 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 | 150.401 |

Above details for information only
Double hook assembly

MHC.000.402.000 = Mooring unit with capstan
MHX.000.402.000 = Mooring unit without capstan

EXPLANATION:
Cap. = Capacity mounting base in kN
Wt. = Weight in kilograms, excl. capstan
X. = Number ans size of HD bolts
S.W.L. = Working load in kN

Dimensions in millimeters

<table>
<thead>
<tr>
<th>Type</th>
<th>S.W.L</th>
<th>Cap.</th>
<th>Wt.</th>
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<th>BB</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>EE</th>
<th>F</th>
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Above details for information only
Triple hook assembly

MHC.000.403.000 = Mooring unit with capstan
MHX.000.403.000 = Mooring unit without capstan

EXPLANATION:
Cap. = Capacity mounting base in kN
Wt. = Weight in kilograms, excl. capstan
X. = Number ans size of HD bolts
S.W.L. = Working load in kN

Dimensions in millimeters

<table>
<thead>
<tr>
<th>Type</th>
<th>MHC</th>
<th>S.W.L</th>
<th>Cap.</th>
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Above details for information only
Quadruple assembly

MHC.000.404.000 = Mooring unit with capstan
MHX.000.404.000 = Mooring unit without capstan

EXPLANATION:
Cap. = Capacity mounting base in kN
Wt. = Weight in kilograms, excl. capstan
X. = Number ans size of HD bolts
S.W.L. = Working load in kN

Dimensions in millimeters

| Type   | MHC   | S.W.L. | Cap. | Wt. | A | B | BB | CC | D | E | EE | F | G | H | K | L | M | N | O | R | T | Z | X |
|--------|-------|--------|------|-----|---|---|----|----|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 040.404| 400   | 1600   | 938 | 578 | 650| 1120| 100| 470| 70| 235| 300| 35| 370| 1228| 96| 300| 235| 235|--|90|300|470|7xM64
| 060.404| 600   | 2400   | 1670| 778 | 750| 1185| 115| 445| 78| 275| 330| 45| 407| 1528| 130| 325| 255| 230|--|100|320|56|7xM72
| 075.404| 750   | 3000   | 2032| 823 | 800| 1300| 150| 505| 86| 290| 355| 45| 417| 1623| 130| 350| 280| 265|--|100|340|50|7xM80
| 100.404| 1000  | 4000   | 2807| 859 | 850| 1365| 125| 520| 96| 300| 395| 50| 447| 1709| 150| 376| 295| 265|--|125|362|60|7xM90
| 125.404| 1250  | 5000   | 3199| 930 | 850| 1365| 125| 520| 96| 300| 395| 55| 479| 1780| 150| 376| 295| 265|--|125|362|60|7xM90
| 150.404| 1500  | 6000   | 4698| 1118|925| 1570| 170| 605| 86| 325| 435| 55| 499| 2043| 150| 426| 325| 280|60|135|415|60|9xM80

Above details for information only
Holding down bolts

Anchorbolt for:
new concrete

Dimensions in millimeters

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Dimensions in millimeters

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Dimensions in millimeters

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<td>M90</td>
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</table>

Above details for information only.

Note: Other types of holding down bolts are available on request.

Explanation: X = Size thread of holding down bolts according to ISO Standard DIN 13
Free standing capstans

Explanation:
X = Number and size of HD bolts
Motor Cap. = Motor capacity in kilowatt

<table>
<thead>
<tr>
<th>Motor Cap.</th>
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<th>B</th>
<th>C</th>
<th>Ø22</th>
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<td>Ø22</td>
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<tr>
<td>5,5 kW</td>
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<td>Ø60</td>
<td>12xM20</td>
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Dimensions in millimeters

Above details for information only
Remote control systems

In addition to the standard manual release, the mooring hooks can optionally be equipped with a remote release system. This enables the operator to release the hooks individually or simultaneously in case of an emergency from a distance, such as the jetty control room. The remote control system is compatible with iMoor. The central control can be operated from multiple positions and by portable devices, like PDAs. Pushbuttons can be installed on the hook's local control panel for local operation as well. An indication whether the hook is open or closed can be transmitted to the remote control panel or displayed by the iMoor application software.

Available systems are:  
• electric-electronic remote control  
• electric-hydraulic remote control

Other systems, such as electric-pneumatic remote control are on request; please contact our sales department for further details.

Electric-electronic remote control

The release mechanism of the mooring hook will be operated by an electric solenoid (magnet) mounted at the hook.

Electric-hydraulic remote control

The release mechanism will be operated by a hydraulic cylinder mounted at the hook. Hydraulic pressure will be provided from a hydraulic power-pack mounted at the mooring unit.

Remote control panel

The different possibilities for a remote control panel are several, please find below some examples.
Mooring load monitoring systems

When a ship is moored, the forces in the mooring lines can be measured by the mooring load monitoring (MLM) system. Overloads on the jetty or mooring lines are identified by this load monitoring system in an early stage, so prompt action can be taken. The loads are displayed in real time in tons and alarms can be set if the loads exceed the safe working load of the mooring line. Retrieval of MLM data from comparable situations can be used as guidance to estimate the required number of mooring lines.

The mooring load monitoring system is compatible with the components of Mampaey's iMoor. The iMoor application software can display for instance the loads together with the local conditions measured by the additional Mampaey environmental monitoring system. This information can also be accessed by portable devices, like PDAs and pagers. With iMoor's I/O module, the remote control signal uses the MLM cable, if present.

iMoor is the combined solution of Mampaey's products

Since all iMoor components belong to the same product family, they are fully compatible. The compatibility provides flexibility in selecting iMoor components to form any desired configuration. The interaction of the system components makes iMoor more than the sum of parts.
Special configurations
Besides the mooring hook units shown in the previous datasheets, Mampaey also supplies other configurations. Some examples:

Commissioning and training
Mampaey Offshore Industries also offers commissioning and training. After being installed and electrically connected equipment can be commissioned and started-up by a Mampaey engineer. Training for jetty and/or control room personnel can also be performed either at Mampaey's premises and/or at site.

Engineering and testing
With more then 100 years experience, Mampaey has an unrivalled understanding of general and specific knowledge of mooring, towing and berthing. All required specializations are present in Mampaey's engineering team to design any system to client specific requirements. Our products are tested before delivery to the client to assure that the product complies with the classification and Mampaey standards.
QUESTIONNAIRE : MAMPAEY QUICK RELEASE MOORING HOOKS

1. Project name / country ?

2. Number of mooring units / nominal - maximum load each unit ?

3. Number of hooks each mooring unit / nominal - maximum load each hook ?

4. Deck structure : Steel or concrete ?

5. Holding down bolts required : YES / NO
   If yes : New concrete / existing Concrete / steel deck ?

6. Maximum vertical hook angle from horizontal level ?

7. Standard coating acceptable : YES / NO
   One (1) layer epoxy zinc D.F.T. 40 mu. and one (1) layer epoxy (black)
   D.F.T. 200 mu., after shotblasting to SA 2.5.

8. Required delivery time for :
   a) Holding down bolts ( If required ) ?
   b) Main materials ?

9. Area classification ?
   a) Hazardous zone 1 or 2 area ( CENELEC ) [ equivalent to class 1 Div 1 or 2 ( NEC ) ]
   b) Non-hazardous areas ( Non-classified ).

10. Integral capstan required : YES / NO
    a) Required line-speed ? : 15 / 20 / 25 / 30 / ….. meters / minute
    b) Required nominal ( = running ) pull ? : 10 / 15 / 20 / ….. kN
       [ Note : Starting pull = 2 times nominal pull ]
    c) Available main power : 380 / 400 / 415 / 440 / 460 / 480 V - 50 / 60 Hz
    d) Braking System Required : YES / NO
       d1) Mechanical braking device [ backstop bearing ] ( Not for reverse operation )
       d2) Electrical braking device ( brake motor ) [ Suitable for reverse operation ]
    e) Local motor-starter at each mooring unit required : YES / NO
       e1) Non-reversible type starter [ for combination with mechanical or electrical brake
       e2) Reversible type starter ( for combination with electric brake only )
    f) Any additional features for the capstans ?

11. Remote control system required : YES / NO
    a) Electric-electronic remote control or electric hydraulic remote control
    b) Are sensors ( proximity switches ) required : YES / NO
    c) Are local electric release push-buttons required : YES / NO

12. Mooring load monitoring system required : YES / NO

13. Berthing approach system required : YES / NO

14. Pressurized control room or indoor non-hazardous area available : YES / NO

15. Any further specific project requirements(s) ?

If you require a proposal please fill in your requirements in this questionnaire and send it to us by e-mail or fax.
On www.mampaey.com via Inquiry you can fill in the Questionnaire Mooring Hooks” and mail it to us.
Other Mampaey products

Berthing approach system

Good judgement of low speeds during the final approach of a vessel is crucial for the safety of the operation, but can be difficult to make. The Berthing Approach System (BAS) uses lasers to measure the speed of approach, angle and distance between vessel and jetty up to 300 meters. The real-time information assists pilots and crew in making an accurate judgement that makes the berthing operation safer.

Quick release towing hooks

Mampaey is more than 100 years a supplier of towing hooks and has achieved market leadership in this field. Two types of hooks are available to serve all customer needs, the “Harbour type” and “Disc type” towing hook. Both towing hooks have the “Quick Release” mechanism that can easily disconnect the towline at all times under full load to guarantee the safety of tug and towage in dangerous situations. The hook can be released from the wheelhouse by pulling the release wire or optionally by pushing a button.

Offshore hooks FSO/FPSO

Mampaey quick release offshore hooks are designed for safe mooring of shuttle tankers to FSO, FPSO or FSRU tankers. The Offshore hooks are used for tandem or side-by-side mooring. In case of an emergency the shuttle tanker can be disconnected, by releasing the offshore hook locally and/or remotely. The range of the Offshore hooks is 150 up to 600 tons S.W.L.

Mooring buoys

Mampaey mooring buoys are in use to moor vessels during loading and unloading operations or at “waiting areas”. Mampaey mooring buoys are robust steel buoys which makes mooring safe, even in the severest conditions. The buoys are specially designed by Mampaey to be integrated with the Mooring hooks. By connecting the anchor chain to the mooring unit directly, a very stable and sturdy buoy is realized. The stability of the Mampaey mooring buoy guarantees a safer operation with a maximum of operational space.
Mampaey innovation:

The new Mampaey **Dynamic Oval Towing (DOT) system** is a 360 degree allround towing system. The DOT-system integrates the towing points for sailing ahead and astern into one system. The system adds safety, controllability and, above all, flexibility to the performance of tugs enabling them to rotate in all directions in a safe and controlled manner irrespective of the heading of the assisted vessel. In exposed conditions this capability will always allow the tug to meet waves safely with bow forward. In confined spaces assisting vessels is much safer because with the 360° allround towing system the tugs’ full power is available in any direction.