STS45LW
SEPARATING TWIN-LIFT LIGHT WEIGHT
PRODUCT INFORMATION

STS45LW HIGHLIGHTS

• High lifting capacity with a low nominal tare weight
• Light-weight for use on cranes rated to lift less weight
• Two 20’ containers can be separated, 0-1600 mm, under full load
• Recessed end beams enable handling of lashing frames and hatch covers
• The advanced control system SCS\(^4\) reduces downtime and ensures fast troubleshooting
• Fulfils the design criteria of EN13001: HC2, HD1, U7, Q3; DIN 15018 H2B4; FEM 1.001 and British standard BS 2573

STS45LW

The Bromma STS45LW ship-to-shore spreader is a light-weight separating twin-lift spreader, ideal for use on cranes that are rated to lift less weight.

With the Bromma adjustable twin-lift STS45LW spreader, a larger percentage of above-deck containers can be transported in twin-lift mode.

The STS45LW is used on ship-to-shore cranes and is one of the market’s most versatile and flexible spreaders.

The twin-lift function makes it possible to lift a broad variety of container sizes and combinations.

The separating function allows two containers to be moved synchronized towards one another and apart from one another, which is important when the containers are being transported on the landside.

The STS45LW is made from European high-quality, high-strength steel, ensuring a light and robust design. It is also user-friendly.

All components are easily accessible for inspection and maintenance. The spreader motions are controlled from the crane.

A standard STS45LW is equipped with the sophisticated SCS\(^4\) control system. Information provided by the SCS\(^4\) not only helps to locate spreader problems fast, but also predicts and prevents problems before they occur.

Spreader data from the SCS\(^4\) can be made available to operators in real-time during operations, and will be stored locally on the SCS\(^4\) for later review, for example during planned maintenance.

STS45LW LOAD COMBINATIONS

[Diagram showing 20', 40', 45' containers and separating twin-lift]
TECHNICAL FEATURES

STS45LW TECHNICAL FEATURES

STEEL STRUCTURE

TELESCOPIC SYSTEM
- Single Telescopic System
- Twin Telescopic/Separating System
- Tie assembly

TWISTLOCK SYSTEM

HYDRAULIC SYSTEM
- Power pack

ELECTRICAL SYSTEM
- Cabinet and components
- Monitoring and diagnostic system SCS

STEEL STRUCTURE

The STS45LW is equipped with 4 x 10 metric tons lifting lugs in the corners of the main frame and the end beams, for heavy lifts and for handling damaged containers.

The design with recessed end beams makes handling of lashing frames and hatch covers possible. The STS45LW provides high lifting capacity with a low nominal tare weight, owing to the box design of the telescopic beams and the main frame.

The spreader mechanical structure is designed in accordance with EN13001: HC2, HD1, U7, Q3, which secures a long fatigue life.

TELESCOPIC SYSTEM

The STS45LW uses two telescopic systems; one for single telescopic mode and one for twin telescopic mode.

The single telescopic system is used to position the telescopic beams on top of the container(s). The spreader can be adjusted to lift containers with sizes between 20’ and 45’. The twin telescopic system is used when lifting and separating two 20 foot containers.

BROMMA
SINGLE TELESCOPIC SYSTEM

The telescopic system is driven by a hydraulic motor and a reduction gearbox connected to an endless chain. This is fitted with a Bromma designed shock absorber at both ends.

Shock absorbers are used to dampen the effects of impact on the spreader structure and components due to forces imposed to the spreader ends. This ability of absorbing extreme forces mechanically makes the STS45LW a highly reliable spreader with increased fatigue life even under extreme load conditions.

TWIN TELESCOPIC/SEPARATING SYSTEM

When separating two 20’ containers additional power is needed. This is achieved through two cylinders, tie beams and latches. The latches connect the cylinders to the TBU via the tie beams so that the additional power is added. The single and twin telescopic system now works together. The spreader is powerful enough to separate and retract two fully loaded 20’ containers. Separation can be done between 0-1600 mm.

Certain irregularities between the two 20 foot containers are accepted as shown below.

- Max 110 mm
- Max 60 mm
- Max 15 mm when containers are lifted
- Max 130 mm

Two 20 foot containers can be separated from 0-1600 mm under full load.
TIE ASSEMBLY

The tie assembly has two ties, two main cylinders and three bearing beams. The short ends of the ties are connected to the cylinders. The bearing beams support the tie assembly, tension rods and main cylinders. The mid part ends of the ties are connected to the twin-lift units. When running the cylinders the movements are transferred to the twin-lift units.

TWISTLOCK SYSTEM

The spreader is latched onto containers by hydraulically-operated floating ISO twistlocks. Each twistlock is operated with a separate cylinder. Proximity switches are used for detecting locked, unlocked and landing pin positions. The floating range is ±6 mm in all directions.

The twistlock pins are based on a nut and key design. They have a tensile strength of more than 1000 N/mm², and are proof load tested to 40 metric tons, to ensure a high durability. The twistlock system also includes a primary interlock in the electrical system ensuring that each twistlock needs to have a landed signal before any twistlock movement.

This electrical interlock is further enhanced by a sensor time delay, as an extra assurance that all twistlocks are really landed before any lock/unlock command can be executed. In addition, all twistlocks incorporate a mechanical interlock to prohibit lock/unlock operation when not landed. Furthermore, the design also includes a squared head on the twistlocks, locking it in the container corner casting during the lifts. Finally, through the pressurized system, the twistlock cylinders will also eliminate unwanted movement in the twistlocks, in order to avoid the risk of accidents.
**FLIPPER ARMS**

The spreader is equipped with four powerful flipper arms working individually (optional) or in pairs. The flippers are driven by hydraulic motors thus providing positive damping to allow efficient gathering onto containers.

Each arm provides a gathering capacity of about 160 mm. The arms are always under pressure and each arm has a shock relief valve. As soon as the shock load ends, the arms return to pre-set position.

The flipper system is designed to give sufficient clearance between any part of the flipper in raised position and in the ship's cell.

**HYDRAULIC SYSTEM**

The complete hydraulic unit consists of a tank, a pump, an electrical motor, valves and a filter, altogether shock mounted in a sturdy frame with protection covers.

The foot and flange mounted three-phase cage induction electric motor corresponds to the major worldwide standards.

The motor gives 7.5 kW at 50 Hz and 9 kW at 60 Hz. The protection grade is IP 55.

To achieve maximum durability, a robust piston pump is used. The pump has low noise level and is easy to service.

The oil tank has an open design and is easy to clean and inspect. The tank holds 90 litres and the oil level is clearly shown through a sight glass.

The hydraulic oil is filtered through an externally mounted 10 micron absolute rated line filter. Additionally, another 10 micron absolute rated return line filter is mounted inside the oil tank.

The hydraulic oil meets the requirements of ISO code 17/15/13 cleanliness classification.

**POWER PACK**

The power pack is designed to work under various conditions and the oil type has to be chosen according to local demands.

Oil is distributed to hydraulic valves on the main frame to control the telescoping. Oil is also distributed to the end beams via hoses that are well-protected inside the cable chains and tension rods. The hydraulic valves for flippers and twistlocks are placed in the end beams.
ELECTRICAL SYSTEM

The power supply to operate the spreader’s electrical components is obtained from the crane.

CABINETS AND COMPONENTS

To ensure protection against environmental factors some electrical components are mounted in a stainless steel electrical cabinet, IP66 rated.

Components not mounted in the electrical cabinet are all rated IP55 or higher, and all cables are well protected in cable chains or cable channels.

For reliability reasons Bromma recommends the use of 24 VDC on all controls.

The electrical safety features to protect and ensure proper handling of containers are as follows:

- When in single lift mode, the spreader cannot be hoisted unless all four twistlocks are fully “Locked” or “Unlocked” (provided the crane controls have a hoist permit safety circuit).

- When in twin-lift mode, the spreader cannot be hoisted unless all eight twistlocks are fully “Locked” or “Unlocked” (provided the crane controls have a hoist permit safety circuit).

- When in single lift mode, the spreader twistlocks can only be “Locked” or “Unlocked” when all four corners are properly seated on a container or hatch cover.

- When in twin-lift mode, the spreader twistlocks can only be “Locked” or “Unlocked” when the spreader is properly seated on all eight corners of the container.
MONITORING AND DIAGNOSTIC SYSTEM SCS\textsuperscript{4}

For monitoring and diagnosing, the STS45LW is equipped with SCS\textsuperscript{4} Spreader Control System. SCS\textsuperscript{4} can communicate with host controllers in the crane by a wide variety of protocols.

The rugged SCS\textsuperscript{4} control unit is equipped with a bright touch screen and mounted on the spreader for easy access.

Monitoring and diagnostics can be available in different ways; on the screen, on the crane (option), through a web interface via an external PC (option), a handheld computer or via Bromma GreenZone applications (option).

The SCS\textsuperscript{4} system delivers advanced monitoring and diagnostic information, which means that service staff can react faster to fault events.

Instead of investigating possible sources of fault events one by one, the SCS\textsuperscript{4} gives service technician’s precise information, enabling them to quickly solve any problems that occur.

The SCS\textsuperscript{4} system simplifies handling of the spreader and prevents fault events. It also eliminates or minimizes junction boxes, terminal strips, and relays – areas where wire breakage is common. Conventional wiring is reduced. The SCS\textsuperscript{4} user interface is intuitive and easy to use. The system also includes complete manuals for the spreader. The backup memory and battery are placed outside the unit and are easy to replace.

The spreader is supplied with CANopen slave units based on a standard field bus system. This enhances the possibility of monitoring each I/O point and reduces the number of cables needed and the replacement time for connecting sensors and actuators to the controls.
## TECHNICAL DATA – STS45LW

### Lifting capacity
(According to EN13001, HC2, HD1, U7, Q3 (2e6 cycles))

<table>
<thead>
<tr>
<th>Standard</th>
<th>Lifting capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Hoisting speed 90 m/min &amp; 0.8 m/s² trolley acceleration)</td>
<td>(According to EN13001, HC2, HD1, U7, Q3 (2e6 cycles))</td>
</tr>
<tr>
<td>One container 41 metric tons (40 LT) evenly loaded</td>
<td>One container 41 metric tons (40 LT) ± 10% eccentric load</td>
</tr>
<tr>
<td>One container 41 metric tons (40 LT) evenly loaded</td>
<td>Twin-lift of two 20’ containers 2 x 25 metric tons (24.6 LT) evenly loaded</td>
</tr>
<tr>
<td>Lifting lugs 4 x 10 metric tons in the main frame and end beams</td>
<td>Lifting lugs 4 x 10 metric tons in the main frame and end beams</td>
</tr>
</tbody>
</table>

### 60 m/min hoisting speed
(Hoisting speed limited to 60 m/min & 0.5 m/s² trolley acceleration)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Lifting capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>One container 51 metric tons (50 LT) evenly loaded</td>
<td>One container 51 metric tons (50 LT) ± 10% eccentric load</td>
</tr>
<tr>
<td>One container 51 metric tons (50 LT) ± 10% eccentric load</td>
<td>Twin-lift of two 20’ containers 2 x 32.5 metric tons (32 LT) evenly loaded</td>
</tr>
<tr>
<td>Lifting lugs 4 x 10 metric tons in the main frame and end beams</td>
<td>Lifting lugs 4 x 10 metric tons in the main frame and end beams</td>
</tr>
</tbody>
</table>

---

**For any other requirements, please confirm separately with Bromma.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separating capacity</td>
<td>0-1600 mm with full load</td>
</tr>
<tr>
<td>Tare weight</td>
<td>Approximately 10.5 metric tons (without extra equipment)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>See dimensional drawing</td>
</tr>
<tr>
<td>Telescopic motion</td>
<td>From 20’ to 45’ in approximately 30 sec</td>
</tr>
<tr>
<td>Flipper arm speed</td>
<td>180° in approximately 5 sec.</td>
</tr>
<tr>
<td>Twistlock rotation</td>
<td>90° in approximately 1.5 sec.</td>
</tr>
<tr>
<td>Standard twistlock torque</td>
<td>Min. 200 Nm</td>
</tr>
<tr>
<td>Twin-lift unit up/down</td>
<td>Approximately 8 sec.</td>
</tr>
<tr>
<td>Twin expand/retract</td>
<td>Approximately 20 sec.</td>
</tr>
<tr>
<td>Hydraulics</td>
<td>System pressure 100 bar/160 bar</td>
</tr>
<tr>
<td>Power supply</td>
<td>400/230 VAC 50 Hz or otherwise as agreed</td>
</tr>
<tr>
<td>Max power consumption</td>
<td>7.5 kW</td>
</tr>
<tr>
<td>Control system</td>
<td>SCS® spreader control system</td>
</tr>
<tr>
<td>Control voltage</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Electrical cabinet</td>
<td>Stainless steel IP66</td>
</tr>
<tr>
<td>Electrical design standard</td>
<td>EN15056</td>
</tr>
</tbody>
</table>
# TECHNICAL DATA – STS45LW

| Surface conditioning                  | Sand-blasted SA 2.5  
|                                      | EPZn(R) zinc epoxy primer 50-90 μm  
|                                      | EP epoxy can be MIO pigmented 100 μm  
|                                      | PUR polyurethane 70 μm  
|                                      | Total: 220 μm |

| Design criteria                      | EN13001; DIN 15018 H2B4; FEM 1.001; British standard BS 2573 |

| Manuals                              | Full service and repair manual supplied |

| Warranty                             | 1 year |

*This specification is subject to alterations without prior notice.*
Dimensional drawings of STS45LW. We reserve the right to change the design and technical data without prior notice.
© 2016 Bromma – All rights reserved.
POSSIBLE ACCESSORIES STS45LW
STS45LW can be equipped with one or several accessories.

- Anybus CANopen Gateway
- Autoconnector
- Container & Twistlock Counter
- Flipper Arm Actuator - SB18
- Flipper Arm Down Indicator
- Flipper Arm Up Indicator
- Flipper Tie
- GreenZone
- Handpump
- High Temperature /Low Level Indicator
- HIS
- Hour Counter
- Ladder High/Low
- LED Lamps
- Load Sensing Crane Cabin Monitor
- Load Sensing System
- Oil Heater
- Plug/Socket