



Pipeline Accessories

**NEW**



**Pipe Transport and Storage  
System88 4 pipes**

# System88 4 pipes



## General information

System88 is a **safe and flexible system to efficiently transport pipes by train or truck or store them**. It is a system that can easily be adjusted for different pipe diameters. The blocks are made out of a PE-compound and are safe for coated pipes. System88 is an engineered system based on extensive research and designed following EN1025 and VDI 2700 regulations. All static and dynamic calculations for pipe transport on truck and train are evaluated and approved by TÜV Nord Germany. As developer and manufacturer of the System88 program, Dhatec and 4 pipes give full technical support and advice.

## System88 offers the following advantages:

- Application range: 8" - 144" (219,1mm - 3.657,6mm)
- 100% safe and reliable, also for coated pipes
- Highly durable and reusable
- Durable, safe for long term use in all weather conditions
- Certified and approved by TÜV Nord Germany
- Easy application
- Reusable and therefore economically attractive
- Requires little storage space only

## Additional information

- Maximum load on Block **A** = 3.935kg (8,675 lbs)
- Block **B C D** – 7.875kg (17,361 lbs)
- Block **K** = 3.150kg (6,944 lbs)
- Block **L** = 4.725kg (10,416 lbs)
- (Each pipe to be supported by a minimum of 4 blocks)
- Detailed instructions and settings are available
- Heat resistant blocks on request
- Anti-skid rubber available for higher frictional resistance
- Systems available for fixing System88 on trailer or wagon
- For larger diameters, raising blocks are to be used
- Static and dynamic-calculations certified by TÜV NORD.
- Copy of certificate available on request

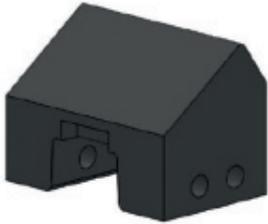
## Equipment

A minimum of 2 profiles per vehicle are required to support the pipes. Blocks will be secured on the profiles. Each bottom pipe is supported by a minimum of 4 blocks. The blocks are secured to the profile by Locking pins with Securing clips.

Material specifications	
Steel profile	Zinc plated steel S275J2, length: 2,70 m or 2,45 m (8.9ft or 8.0ft)
	Square tube: 80 mm x 50 mm x 5 mm (3.15" x 1.97" x 0.20") approx. 20 kg (44lbs)
	UV-stabilized
Locking pin	Zinc plated steel Grade 8.8 Ø 20 mm (0.79")
Blocks	PE-compound, colour: Black
	Frictional resistance factor (F.r): 0,3
	Frictional resistance factor (F.r): with Anti-skid rubber: 0,6
	Mounting holes in each block
	UV-stabilized
Raising Block	Zinc plated steel S355 540 mm x 201 mm x 191 mm (21.26" x 7.91" x 7.52")
Product range	219,1 mm - 3.657,6 mm (8" – 144")



## System88 4 pipes

<p><b>System88 steel profile</b>          The square profile is available in the standard width of a          - truck's trailer: 2.450 mm - <b>Art. No. 59000</b>          - train's trailer: 2.700 mm - <b>Art. No. 59001</b>          The weight of the profile is approx.          20 kg (truck) / 22kg (train)</p>	
<p><b>System88 Block A</b>          This block will be placed on the bottom-profile.          Diameter range: Ø 219.1 - 558.8 mm.          Weight of the Block: approx.1.8 kg.  <b>Art. No. 59005</b></p>	
<p><b>System88 Block B for bottom-profile for Ø 406-945 mm</b>  <b>Art. Nr. 59007</b></p>	
<p><b>System88 Block C for bottom-profile for Ø 558-1422 mm</b>  <b>Art. Nr. 59009</b></p>	
<p><b>System88 Block D for bottom-profile for Ø 1422-2032 mm</b>  <b>Art. Nr. 59010</b></p>	
<p><b>System88 Block K</b>          This block will be placed on a mid-profile.          Diameter range: Ø 219.1 - 558.8 mm.          Weight of the Block: approx. 2.8 kg.  <b>Art. No. 59006</b></p>	
<p><b>System88 Block L</b>          This block will be placed on a mid-profile.          Diameter range: Ø 406.4 - 1,219.2 mm          Weight of the Block: approx. 7.4 kg.  <b>Art. No. 59008</b></p>	
<p><b>Locking pin for blocks</b>          This pin is used to secure the block on the rail. When          the block and the rail align, a pin is placed through the          aligned holes. Weight of the Locking pin: approx. 0.6 kg  <b>Art. No. 59015</b></p>	
<p><b>Securing clip for Locking pin</b>          This is a safety attribute which will decrease the chances          of the pin failing to secure the block on the rail.          Weight of the clip: approx. 0.1 kg.  <b>Art. No. 59016</b></p>	
<p><b>Anti-skid (NOT used when working on trains)</b>          Anti-skid increases the friction between System88 and          the load (0.3 → 0.6). Although it is not mandatory, 4pipes          strongly recommends using it.          Weight of the anti-skid: approx. 1.4 kg/m.  <b>2,50 meter - Art. No. 59017</b>  <b>2,75 meter - Art. No. 59018</b></p>	

## System88 4 pipes

Available sizes Basic Blocks		
Block	Diameter range	Weight
Type A	Ø 219,1 mm – 558,8 mm (8.63" - 22")	1,8 kg (3.97 lbs)
Type B	Ø 406,4 mm – 965,2 mm (16" - 38")	3,7 kg (8.16 lbs)
Type C	Ø 558,8 mm – 1.422,4 mm (22" – 56")	7,5 kg (16.5 lbs)
Type D	Ø 1.422,4 mm – 2.032 mm (56" - 80")	12,0 kg (26.5 lbs)
*Raising Block	Ø2.032mm-3.657,6mm (80" – 144")	30 kg (66 lbs)

\*Addition for Block D: Raising Block  
Raising Block is available for Block D, it adds 140 mm height to this block, preventing the pipe from hitting the steel profile.

Available sizes Middle Blocks		
Block	Diameter range	Weight
Type K	Ø 219,1 mm – 558,8 mm (8.63" - 22")	2,8 kg (6.17 lbs)
Type L	Ø 406,4 mm – 1.219,2 mm (16" - 48")	7,4 kg (16.3 lbs)



### Application

The base-section is placed on trailer or truck bed. After loading the bottom pipes, the mid-section is placed on top for the next layer of pipes. Pyramid stacking on the base-section is also possible.



## System88 4 pipes

### Tie down

Loads need to be secured to prevent movement of goods and to be allowed to travel on public roads. Each country has its own laws regarding the amount of securing needed. 4 pipes bases their calculations on the norm VDI2700. Customer specific calculations can be done on request. Using Anti-skid (truck) can greatly reduce the number of tie downs necessary.

Tie downs are available in lengths of 9 m or 12 m.

Lashing capacity: 2500 daN (single)  
5000 daN (looped)

$S_{hf} = 50\text{daN}$ ,  $S_{tf} = 750\text{ daN}$   
Norm: EN 12195-2

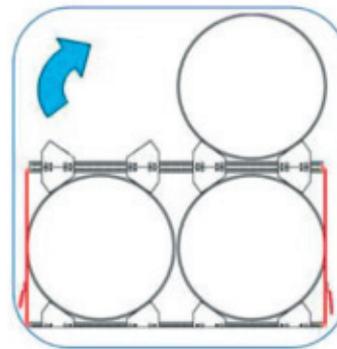


### Connector belt

When a layer consists of 2 pipes, there is a chance the system will tilt when placing a pipe on a mid-section. To prevent this, the rail of that layer is connected to the rail of the section below.

Lashing capacity: 1000 daN (single)  
2000 daN (looped)

$S_{hf} = 50\text{daN}$ ,  $S_{tf} = 100\text{ daN}$   
Norm: EN 12195-2



Tilting S88



Connector belt

### Profile-to-trailer connector

Similar to the connector belt, the Profile-to-trailer connector connects the profile to the trailer. This will prevent tilting and displacement of the bottom layer.

Lashing capacity: 1000 daN (single)  
2000 daN (looped)

Norm: EN 1492-1

Profile-to-trailer connectors are 0,7 m long and sold as a pair.



Profile-to-trailer connector

### Hoisting belt

When the blocks are assembled on the rail, the total weight can be high. That's why lifting is best performed by a crane or forklift using Hoisting belts.

Lashing capacity: 1000 daN (single)  
2000 daN (looped)

4 pipes hoisting belts are 2 m long.



## General instructions for System88

Before using System88, all parts should be subjected to a visual inspection. If any below listed defect is observed, discard the relevant part.

### Product failures:

- The System88 blocks may not show permanent imprints of pipes on the supporting faces.
- The edges of the System88 blocks may not be worn off more than 10 mm.
- The System88 blocks should always fit over the System88 profile without any problems.
- The holes in the System88 blocks may not show signs of permanent deformation or fractures. They should not be oval or have a diameter larger than Ø 23 mm.
- The holes of the System88 profile may not show signs of permanent deformation or fractures. They should not be oval or have a diameter larger than Ø 23 mm.
- The System88 profile should not show signs of bending or deflection after installation.
- The System88 steel profile may not show signs of corrosion, permanent deformation or cracks.
- The anti-skid rubber mats may not be torn or crushed, during or after installation.
- The Locking pin may not show signs of permanent deformation, fractures or corrosion.
- The Securing clip must have its original shape. The ring has to lock under spring tension.

When using System88, the procedures listed below should always be regarded. The following list is only a brief overview of the procedures that should be respected, a complete elaboration can be found in the following paragraphs of this chapter.

## A. Installation of System88

- A.1. Preparation
- A.2. Installation of profile
- A.3. Installation of block A

## B. Loading of pipes

- B.1. Verification of block settings
- B.2. Placement of bottom pipes
- B.3. Verification of support of bottom pipes
- B.4. Installation of blocks K or L
- B.5. Placement of remaining layers

## C. Securing of pipes

- C.1. Applying safety features

## D. Unloading of pipes

- D.1. Checking stability of pipe stack
- D.2. Unloading pipes

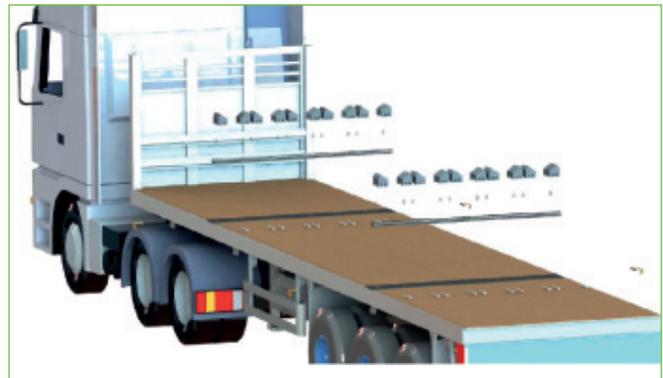
## E. Disassembly of System88

- E.1. Removal of S88 parts

## A. Installation of System88

### A.1. Preparation

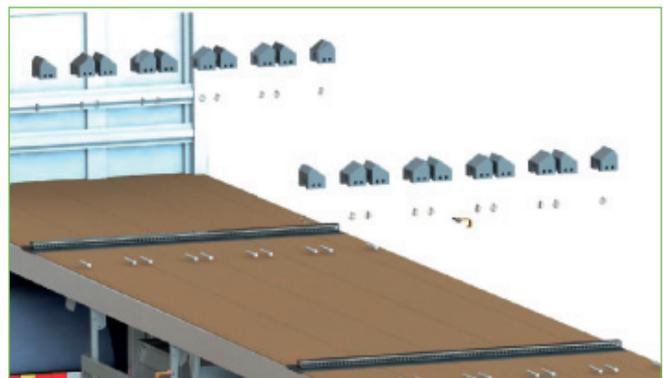
- Make sure the trailer is free of ice, snow, oil or anything else that could influence the friction.
- Make sure the trailer is solid. There should be no weak or rotten spots where the system will be placed.
- Make sure the trailer fits the bill. This means checking if it can handle the weight, is wide and long enough and all safety features are present.
- Place Anti-skid on places where the bottom profiles will come (Truck only).



Start set-up with Anti-skid in place (trucks only)

### A.2. Installation of the profiles

Place the base profiles on the trailer. When the base profiles are in place, fasten (screw 10x) it to the trailer or use profile-to-trailer connectors.



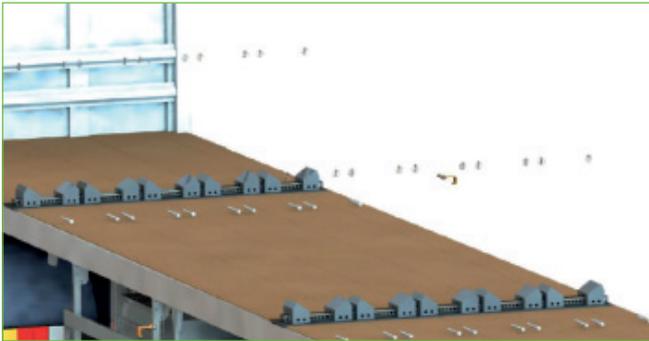
Fasten profile to trailer

## System88 4 pipes

### A.3. Installation of Block A

If the base profiles are attached to the trailer, block A can be placed. Check the configuration supplied by 4 pipes for their exact placement.

- When the blocks are placed on the base profile, secure them with the Locking pins and Securing clips.



#### Place block on profile

Optional, but strongly recommended when driving without load on the system: Make sure the rail is connected to the trailer with a Profile-to-trailer connector. Unconnected rails can cause tilting and are extremely dangerous.

Fasten the Profile-to-trailer connector with a pin to the profile, secure the pin with a clip. Hook the other end to the trailer. Only fasten the Profile-to-Trailer Connector and do not tension it. Place the Profile-to-Trailer Connector on the other side in a similar way, when both sides are fastened, they can be tensioned.



#### Lock the blocks with a pin and place profile-to-trailer connectors

Place Anti-skid on top of the blocks (Truck only). This will increase the friction between pipe and block and reduce the number of tie downs required to secure the pipe.



#### Place Anti-Skid on top of the blocks (truck only)

### B. Loading of pipes

#### B.1. Verification of block settings

When everything is in place, re-check the distances between the blocks. When the measurements don't comply, start over.

#### B.2. Placement of bottom pipes of stack

If everything is checked and approved, it's time to place the first layer of pipes onto the system.

- Make sure that the pipe surface is free from snow, ice, oil or anything that could influence friction between pipe and block.
- For trucks only: Although not mandatory, we strongly recommend placing an Anti-skid layer on the PE-blocks.

There should be Anti-skid:

- Between the rail and the trailer
- Between the base blocks and the pipes
- Between the pipes and the mid blocks (both sides)

Place the first pipe. Check the gap between the rail and the pipe and see if it matches the dimensions on the configurations.



#### Place pipes on the bottom blocks



#### Place Anti-skid on the bottom layer (Truck only)

#### B.3. Verification of support of bottom pipes

When the first layer is in place, make sure every pipe is stable. Check the distance between the pipes and between the pipes and rail and compare with the configuration.

## System88 4 pipes

### B.4. Installation of Blocks K or L

When the first layer of pipes is in place, another rail needs to be placed. The easiest way to prepare this rail is to place blocks K or L when the rail is not yet in place. Check the positioning of the blocks in the configuration and secure them the same way as the blocks on the base profile (Locking pins with Securing clips).

After everything is secured, place the rail on top of the pipes as shown in following figure. Due to the weight, we advise to use a hoisting belt to place the mid-section on the pipes.

Make sure both the blocks and the rails align. Connect the rail to the bottom rail using a Connector belt. This will prevent tilting of the load while loading pipes.



Place the mid-section with blocks on top of the bottom layer



Place the Connector belts



Place Anti-skid on the mid-section (Truck only)

### B.5. Placement of remaining layers

If the first layer is stable and approved, the next layers can be placed likewise. Remember to use Anti-skid (truck only) and connector belts where choosing to.



Place remaining layers

## C. Securing of pipes

### C.1. Applying safety features

Before securing the pipes, check if the measurements of the load match the measurements on the configuration. Using anti-skid is not mandatory, neither is using a profile-to-trailer connector when driving with a load and connector belts when transporting layers that consists of 3 or more pipes.

A couple of safety features could already be in place: Profile-to-trailer connector, connector belts, anti-skid (truck). The last step is placing tie downs (and optional Slide Stops) along the length of the trailer.



Place other safety attributes

The number of tie downs depends on the weight of the load.

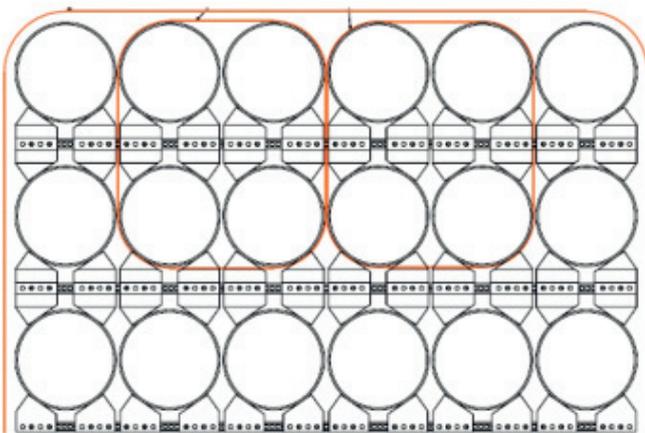
Total weight of the pipes	Number of tie-downs (STF750 daN, LC 2500)	
	With Anti-skid layers	Without Anti-skid layers
30.000 kg	9	45
25.000 kg	8	38
20.000 kg	6	30
15.000 kg	5	25
10.000 kg	3	15
5.000 kg	2	8

## System88 4 pipes

As seen in the table above, using anti-skid significantly lowers the number of tie downs needed to secure the load. Always use enough tie downs. Divide the tie downs evenly along the length of the load. Make sure they are not twisted.

### Anti-skid may only be used on trucks, NOT on trains!

If the top layers contain more than 2 pipes, the middle pipes on top are not secured with tie downs. This can be rectified by using Slide Stop. Because Slide Stop is an engineered pre-shaped beam, when tensioned it will secure the middle pipes. This can also be done by placing tie downs around smaller sections of pipes. When necessary, ask 4 pipes for a strapping scheme.



Example Strapping scheme



Truck ready to go



Flatcar ready to go

When finished, re-check every tie down, connector belt, Profile-to-trailer connector and Slide Stop. **Every driver is responsible for his or her own load.** Adapt driving style to weather conditions.

## D. Unloading of pipes

### D.1. Check stability of pipe stack

Before unloading the pipes, be sure the stack is stable. This means no pipe will shift or start to roll when unloading another pipe. Be careful when removing tie-downs because of the high tension.

### D.2. Unloading pipes

Start unloading with the outer pipes. Make sure the connector belts and profile-to-trailer connectors stay in place until the entire parent layer is unloaded.

When unloading the outer pipes, unload the corresponding pipe on the other side next to minimize the risk of tipping. If an entire layer is unloaded, the connector belt from that layer can be removed. With a hoisting belt, the rail and blocks can be lifted off as 1 piece.

## E. Disassembly of System88

### E.1. Removal of S88 parts

When the pipes are unloaded, the System88 parts can be disassembled. Follow steps A3-A2-A1.

Collect every pin with Securing clip used to hold the blocks in place. Make sure the Securing clips don't show deformations. If any show deformations, discard them. Check the blocks for pipe imprints. If any deformation is permanent, the block needs to be replaced. The wear on the edge shouldn't exceed 10 mm.

### End note

This recommended practice is put together with great care. When safety risks are noticed which are not covered by this instruction please contact 4 pipes to share this finding.

- [1] Pipe Configurations are supplied with the first delivery, contact our office for copies and updates.
- [2] Truck drivers should have been educated to load their vehicles properly and therefore are assumed to be familiar with loading prescriptions.