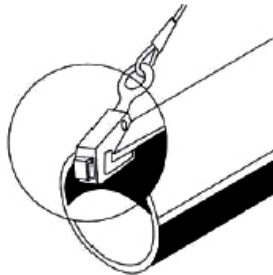


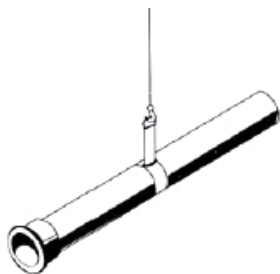
Handling of ductile iron pipes

The mechanical strength of ductile iron pipes and fittings, coupled with the robustness of their coatings, makes them adequately suitable for site handling conditions.



- Use sufficiently powerful lifting gear.
- Guide the beginning and ending of the lift.
- Manoeuvre gently
- Avoid swinging, impacts or pipes rubbing against other pipes, the ground or trailer stanchions.

These precautions are particularly important for large diameter pipes, or those having special coatings.



End Lifting

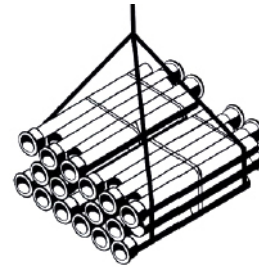
Use appropriately shaped hooks, coated with a polyamide type protection. Please consult us.

Barrel lifting

- Use wide flat slings maintained sufficiently widely apart to prevent accidental slippage.
- Prohibit wire ropes, which may damage the coating.

A single sling may be used on site. In this case, lift the pipe at its centre of gravity, with the sling gripping the pipe to prevent slippage.

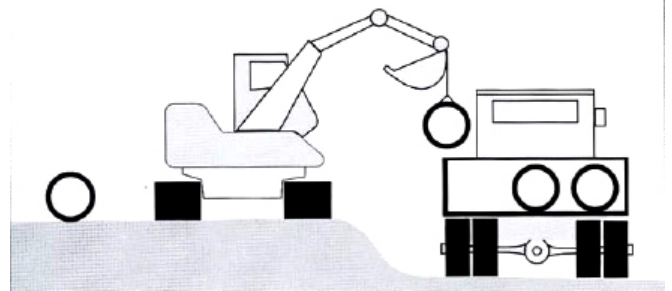
String the pipes out in the work



Bundle lifting

DN80 to 300 bundles are unloaded with flat textile slings

String the pipes out in the work



Unless specified otherwise, string the pipes out along the trench side opposite the excavated material, with the sockets pointing in the direction of laying (spigot end directed towards start of laying).

Avoid:

- Dragging the pipes on the ground, as this risks damaging the external coating.
- Dropping pipes to the ground, even with tyres or sand interpose.
- Stringing out pipes in areas of risk: e.g. machines passing frequently, use of explosives (risk of flying stones).
- Depositing pipes on large stones, or precariously balanced.

Storage and bundle stacking

Storage of pipes and fittings on site must permit correct inventory control and facilitate any repair work and the storage area must be level.

Avoid:

- Marshy ground,
- Shifting soils.
- Deliveries must be inspected on arrival to the storage area and there is any damage (e.g. Internal or external or external coating damage), it must be repaired before going into stock.
- Stack the pipes in homogeneous piles (same diameter), in accordance with a rational storage plan. The same applies for fittings and accessories.
- Use sufficiently strong, good quality hard woods (timbers, wedges).
- It is always desirable to reduce the storage times as much as possible.
- Precautions need to be taken if the pipes have special coatings. Please consult us.

The bundles supplied by MAFUSA can be stacked in a pile on 80x80x2600mm timbers, with 3 or 4 bundles per row, not exceeding a stack height of 2.50m.

Check the condition of the bundles periodically; in particular, the condition and tautness of the straps, as well as the general stack stability.

1. Pyramid stack, socket to spigot



In practice, this is the method of most interest from the point of view of safety, cost of supporting materials and the ratio of the number of pipes stored to stack volume.

This method, however, necessitates end-lifting by means of hooks (see HANDLING); use of multiple hooks allows lifting of several pipes simultaneously.

Bottom layer: the bottom layer is laid on two timbers, arranged in parallel, one being 1 m from the socket end and the other 1 m from the spigot end. The pipes are also parallel with one another. The sockets touch and are not

in contact with the ground. The pipes at the two ends are secured at the sockets and spigots with large wooden wedges nailed to the timbers. The intermediate pipes are only secured at the spigot end, using smaller wedges.

Upper layers: the upper layers consist of pipes laid alternately socket to spigot, with all the sockets in one tier overhanging the spigot ends of the tier below, by the length of the socket plus 10 cm (to prevent spigot deformation). The barrels of two consecutive tiers are in contact.

2. Uniform stack, sockets at same end



Borrom layer: the bottom layer is identical to the case above.

Upper layers: the pipes are in line vertically. Each tier is separated by timbers slightly thicker than the difference in diameter (socket-barrel).

The end of pipes in each tier are secured by wedges nailed to the timbers. This method allows all types of lifting (end-hooks, slings around the barrels, forklift trucks).

3. Square stacks



Bottom layer. Laying and wedging of the bottom layer is identical to the first method, but the pipes are sockets to spigos; their barrels are in contact. In addition, the sockets project beyond the spigots of adjacent pipes by the whole socket length, plus 5 dm. for $D_n \geq 150$ pipes stacking is on

three timbers (instead of 2).

Upper layers: each tier consists of parallel pipes laid socket to spigot, as in the bottom layer. The pipes in one tier run at right angles to those in the tier below. The pipe ends are consequently wedged naturally by the alternating sockets

in the tier below. This method keeps the packing material to a minimum, but involves individual liting of pipes because of the stack formation. It is strongly recommended however that it should not be used for pipes with special coatings, in view of the type of support (point contacts).

Depending on the type of stacking, pipe class and DN, it is recommended that the values below should not be exceeded. Maximum number of tiers as a function of stack formation:

DN	Case 1			Case 2 and 3		
	K7	K8	K9	K7	K8	K9
80	-	-	70	-	-	30
100	-	-	58	-	-	27
150	-	-	40	-	-	22
200	-	-	31	-	-	18
250	-	-	25	-	-	16
300	-	-	21	-	-	14
350	-	-	18	-	-	12
400	-	-	16	-	-	11
450	-	-	14	-	-	10
500	-	-	12	-	-	8
600	-	9	10	-	-	7
700	-	6	7	-	-	5
800	-	5	6	-	-	4

Storage gaskets

STORAGE AND APPLICATION

Certain precautions need to be taken when storing gaskets, because of their characteristics.

These mainly concern:

- the storage temperature,
- the humidity or dryness of the storage atmosphere,
- exposure to light,
- length of storage

* STORAGE TEMPERATURE

Standards ISO 2230 give detailed recommendations on gasket storage, for conserving their properties and performance.

The storage temperature must be below 25°C Gaskets must not be deformed at low temperature. Before use, their temperature must be brought up to about 20 °C over several hours, to allow them to recover their original suppleness (e.g. by immersion in tepid water).

* HUMIDITY/DRYNESS OF THE STORAGE ATMOSPHERE

Vulcanized elastomeric joint gaskets must be stored under moderately humid conditions.

* EXPOSURE TO LIGHT

Elastomers are sensitive to ultra-violet light and ozone. Stored gaskets must therefore be screened from light (direct sunlight and artificial light).

* STORAGE PERIOD

We consider acceptable to use normal joint gaskets and flat gaskets stored under the conditions* stipulated in Standards ISO 2230, within a period of six years following manufacture.

* (Storage conditions for vulcanized elastomers).

