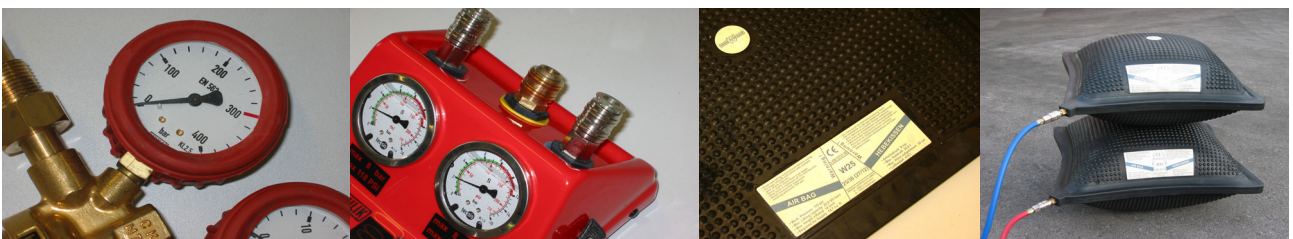


OPERATING INSTRUCTIONS
AIR BAGS 8 bar

WEBERRESCUE

SYSTEMS



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Edition: 01.07.2011
Subject to revision.

Important instructions:

- Before using the air bag, carefully read these instructions. Non considering can result in various damages.
- Operating personnel has to be trained on use of air bags and has to wear full set of protective clothing.
- Immediately support lifted object - never work under a load without safety supports.
- Never exceed the max. inflation pressure of 8 bars (118 psi).
- Never stack more than two air bags.

Information

This booklet contains technical information about lifting air bags and basic instructions for use. The selection and application of an air bag depend on various factors such as lifting requirements, capacity, lifting height, shape of objects. The manufacturer doesn't assume any responsibility for personal injuries or material damages arising from improper use or misuse of lifting air bags and accessories. The figures beside the text are shown for information only. Actual conditions of lifting techniques and characteristics depend on particular application and are from case to case different.

Recommendations for safe and efficient work

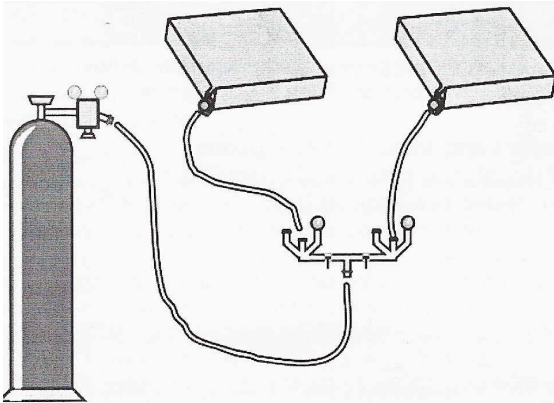
When using air bags, always wear protective clothing. Firemen and rescue-team members must be equipped completely in accordance with the requirements, other users should wear safety helmet, safety glasses and gloves or other equipment if required.

Proper transportation of air bags is of great importance. Care should be taken that air bags are always being carried with the inflation nozzle facing upwards to avoid damaging it in case of an air bag's falling down. Air bags of great sizes and weights are to be carried by two persons. When air bags are stored or transported in horizontal position, the inflation nozzle must face ahead so that it can be easily seen when an air bag is to be moved, and that the work can be done safely without risk of damage.

When the surface temperature of the object to be lifted exceeds 55°C, the part of the air bag in contact with the object is to be protected by means of a fibreboard. Heat and temperatures exceeding the permissible level can damage the air bag.

Even though it is simple to place and to inflate the air bag, the operation in dark is dangerous. The work place is to be well illuminated. Sometimes, when due to the affect of shading the visibility is poor, even during the day it is reasonable to use additional sources of light.

How does an air bag system operate?



Prior of the use of air bags, set the pressure to 0,8 Mpa (8 bar, 118 psi) using the pressure reducing valve. The two filling valves on the double controller are to be closed. Connect the air bag to the distribution pipes and set it to the correct lifting position. Open left or right filling valve on the double controller. By means of a pressure gauge check the working pressure and the air bag operation at inflation. After concluding the operation of lifting or separating, close the filling valve on the controller. To let off the air open the safety valve on the double controller.

Remove the air bags from the site of use, disconnect them, load them to press out the remaining air and clean them.

WARNING!

Always use combination of single/double safety controller – inflation hose – air bag to avoid exceeding nominal pressure. Never omit safety controller and never connect pressure reducer directly to an air bag. Safety controllers and pressure reducer are equipped with safety valves which limit air pressure by means of pressure relief valves.

Pressure gauge of safety controller show internal pressure of air bags and indicate improper inflation. Inflation hoses are different in colour to easily separate between air bags.



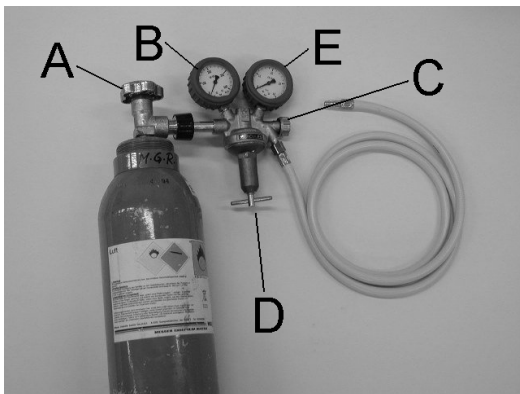
Inflation hoses are equipped with safety couplings with. They open only if you press in male coupling and pull back sleeve of female coupling.

Air supply

Each air source which does not exceed a pressure of 12 bar can be used to inflate air bags 8 bar. If air source supplies more than 12 bar, a pressure reducer has to be used. ALWAYS use safety controller.

Air bags can be operated by less than 8 bar also, but max. lifting force decreases accordingly. If air contains oil or/and water an oil/water separator has to be used.

Use of compressed air bottle with 200 or 300 bar pressure

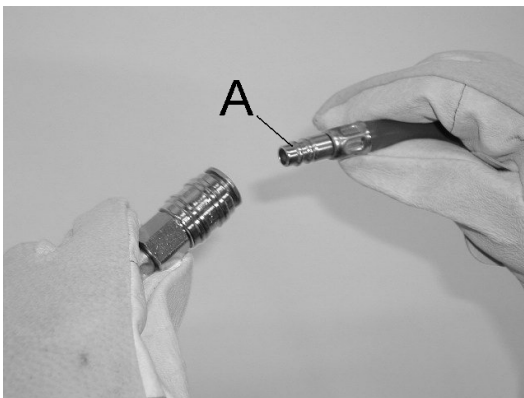


Connect pressure reducer to the bottle, take care of proper seat of the sealing ring. Close air supply by turning screw © clockwise. Open valve of compressed air bottle (A), pressure gauge (B) will show pressure in air bottle.

By means of regulator (D) reduce pressure to max. 10 to 12 bar (E); open screw (C).

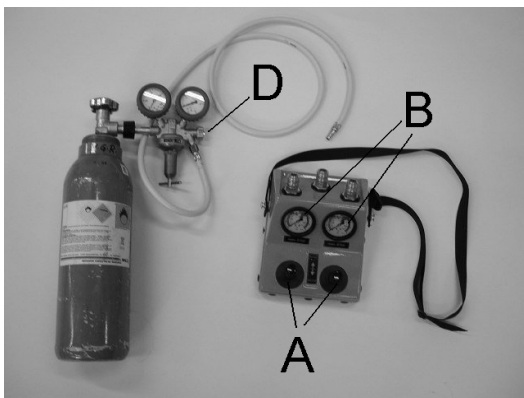
Connection hose to the safety controller must be connected. Ensure proper seat of the couplings.

Air bags with safety controller



Connect air bags with inflation hoses (different colours) to the safety controller.

Plug in male coupling (A) into female with double lock.



Connect air supply to the controller.

By using another air source reduce pressure to max. 12 bar or use a pressure reducer.

Air bags are inflated by pulling according lever (A) of safety controller. Always control pressure gauges (B), which indicate pressure of air bags.

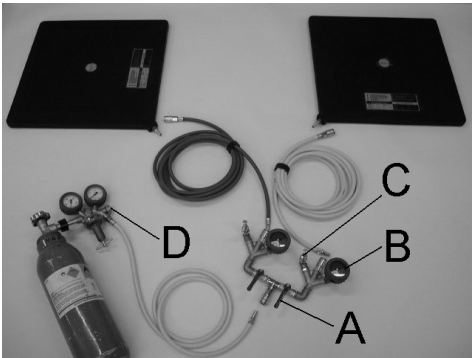
Inflation/deflation will be stopped automatically when lever is released (dead-man-control).

If the pressure exceeds 8 bar it will be released by the pressure relief valve.

To deflate the air bag or lower the load, use levers (A) – do not disconnect inflation hoses!

When finishing lifting operation close screw (D) at pressure reducer.

Release remaining air in the connection hoses by pulling lever (A).

Air bags with single/double safety controller and shut-off slide

Connect single or double safety controller to air bags with inflation hoses of different colours.

Plug in male coupling (A) into female with double lock.

Connect air supply to the controller.

By using another air source reduce pressure to max. 12 bar or use a pressure reducer.

Air bags are inflated by opening shut-off slide (A) of safety controller. Always control pressure gauges (B), which indicate pressure of air bags.

If the pressure exceeds 8 bar it will be released by the pressure relief valve.

When finishing lifting operation close screw (D) at pressure reducer.

Release remaining air in the connection hose by opening shut-off slide (A).

Use of other air sources:

To use other air sources maybe adaptors need to be used.

If air source supplies more than 12 bar, a pressure reducer has to be used.
ALWAYS use safety controller.

USE OF AIR BAGS

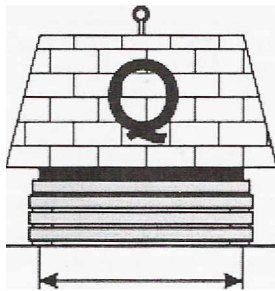


Fig. 1

Place air bag on a prearranged place or a constructed foundation (Fig. 1). Fully emptied air bags have the lowest insertion height.

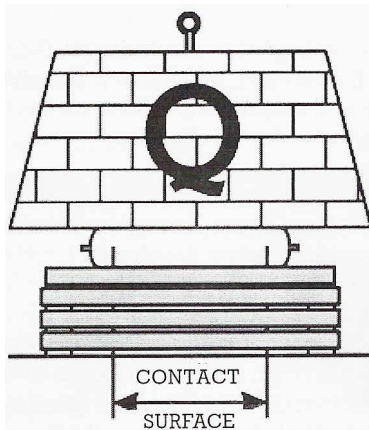


Fig. 2

During the process of air bag inflation, the air pressure and consequently the lifting height are increasing, while the contact surface between the bag and the object is decreasing, resulting in decreasing lifting capacity (Fig. 2). Thus, maximal force can be attained only at the beginning of inflation, when the lifting height is minimal. During the inflation, the air bag is gradually getting a characteristic spherical form (see diagrams).

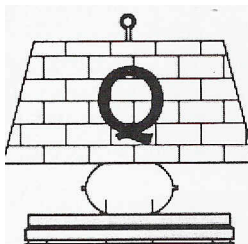
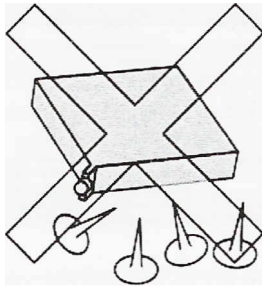


Fig. 3

With the air bag fully inflated, the contact surface and lifting capacity reach their minimum, and the lifting height its maximum (Fig. 3). To be able to correctly operate the air bag, a user must be acquainted with the data about maximal lifting force, maximal lifting height and maximal lifting capacity at maximal lifting height.

LIFTING USING A SINGLE AIR BAG

1. The place where the air bag is intended to be placed, is to be cleaned of glass fragments and any other particles which might damage the air bag. When the air bag is to be put on a surface, presenting the risk of slipping the surface is to be covered with sand or any other granulated material. When the air bag is used on a not firm and soft ground, a solid support or a fibreboard is to be arranged under the air bag.

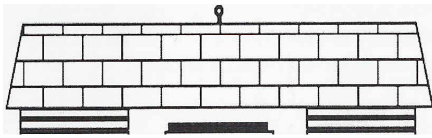


Fig. 4

2. When there is more than 70 mm space between the ground and the object to be lifted, a firm foundation is to be built leaving just enough space to insert a non inflated bag. This maximizes lifting force and height. (Fig. 5)

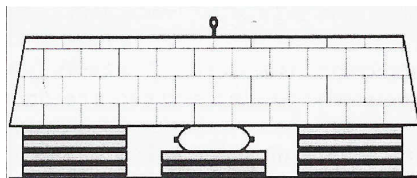


Fig. 5

3. On each side of the air bag foundation, additional safety supports are to be built extending to the maximum possible height (Fig. 6). This reduces the height, from which the object of lifting would fall in case of an eventual damage to the air bag system..

4. The air bag is to be inserted in the middle of the foundation so that the inflation nozzle is pointed right or left from the object to be lifted. Always make sure that the air bag surface lays against the lower surface of the object. A too small contact surface can cause the object to slide during the inflation, as the inflated air bag would considerably displace from the object to be moved.

5. Inflate the air bag to achieve the required height, then add safety supports as high as possible (Fig. 6). Provided that sufficient staff is available, the safety supports are recommended to be built simultaneously with the air bag inflation.

6. Slowly empty the air bag, allowing the object to lay safely upon the safety supports. Remove the air bag and the foundation if the required working area is located under the lifting point.

WARNING!

At any lifting operation, the safety supports are of essential importance. Any work under a load supported only by an inflated air bag is strongly forbidden!

LIFTING USING TWO AIR BAGS

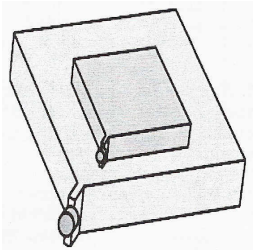


Fig. 6

In order to increase lifting height, *two* air bags can be used, placing the smaller one in the middle of the bigger one, with the inflation nozzles pointing away from the object to be lifted, each one to the other side, right or left (Fig. 7).

Never stack more than two air bags!

Similarly to the lifting with a single air bag, it is necessary to construct a foundation.

First inflate the lower, greater air bag, so as to allow the smaller one to touch the object to be lifted. Then fully inflate the upper air bag and, if necessary, the lower one again, until the required lifting height is achieved.

Safety supports are to be added under the load with care. After concluding the inflation, slowly empty the air bags.

Increasing lifting capacity and height

It is wrong to believe that lifting capacity can be increased by stacking air bags. With a block of two air bags one upon another, only lifting height can be increased, while lifting capacity of the block is the capacity of the smaller air bag (Fig. 10). Lifting capacity depends on the size of the air bag surface in contact with the lower surface of the object to be lifted. Thus, lifting capacity can only be increased by placing one air bag beside another, provided that both are being inflated simultaneously.

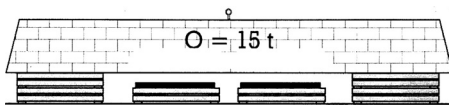


Fig. 7

Fig. 9 shows two air bags, placed one next to the other on foundations. The first air bag can lift 8 tons, the second 12 tons. Neither of the bags can lift the load of 15 tons. However, when being inflated together, they are able to lift even 20 tons, and consequently, using this bloc, the load of 15 tons can be lifted.

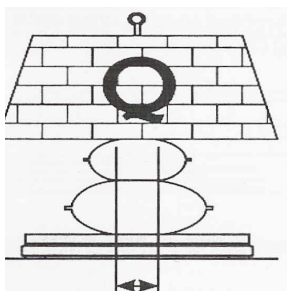


Fig. 8

Lifting height can be increased by placing one air bag upon another (Fig. 10). If the lifting height of one bag is 18 cm max and of the other 22 cm, both together and fully inflated can achieve the lifting height of 40 cm.

By constructing supports topmost lifting heights and capacities can be achieved.

WARNING!

Never stack more than two air bags!

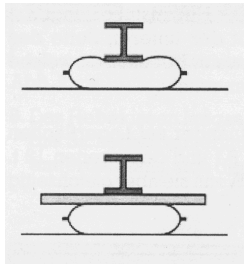
LIFTING THE OBJECTS OF UNUSUAL FORMS**Lifting a profile or a tube**

Fig. 9

At lifting a profile or a hose using an air bag, problems arise as the object doesn't contact the entire surface of the bag. Further, a steel or Kevlar cord can be damaged by twisting. For that reason a fibreboard is to be inserted between the air bag and the object to be lifted, in order to permit the lifting force to be equally distributed over the entire lifting surface of the air bag (Fig. 9).

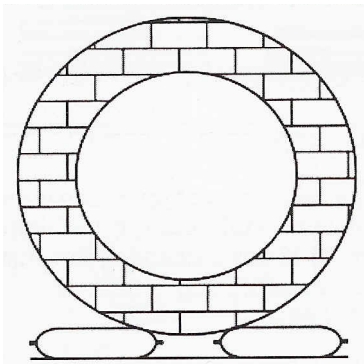
Lifting a cylindrical object

Fig. 10

Cylindrical objects of great size such as tanks don't admit lifting by a single air bag. If such object is not firmly fastened it shall roll away as soon as the air bag begins extending to get its typical spherical form. For that reason cylindrical objects are to be lifted using two air bags, one at each side of the object. The air is to be supplied so as to permit equal, co-ordinated lifting (Fig. 10).

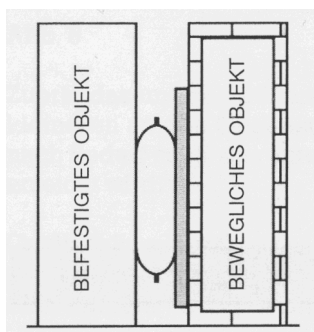
Separating and pushing, using air bags

Fig. 11

Air bags can also be used to separate and to move objects, usually without special difficulties. Problems arise if an object has thin walls which could be bent or broken by the pressure of the air bag. For that reason the air bag is to be reclined against a rib, a pillar or another tough and rigid element. If this is not possible, insert a wide fibreboard between the air bag and the object to increase the surface the pushing force shall act upon (Fig. 11).

CLEANING AFTER USE

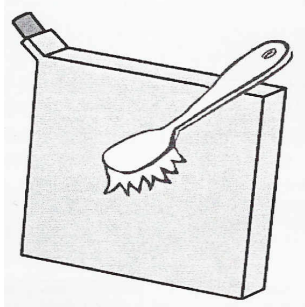


Fig. 12

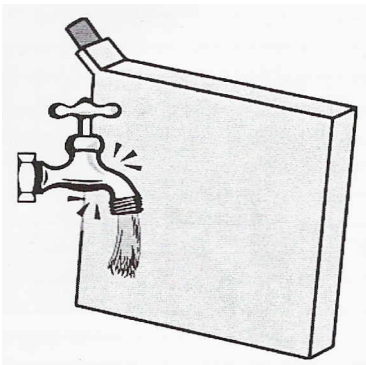


Fig. 13

Each time after use air bags are to be cleaned. Oil or grease spots can cause air bags to slide, the presence of dirt in the nozzle disable the connection of pipe. Check the opening in the nozzle. If it is full of dirt, remove it using a thin piece of wire. Don't push the dirt inside the bag but draw it out.

To remove agglutinated dirt from the air bag surface, use a brush with hard bristles. Don't use sharp objects to remove dirt from the air bag surface.

After cleaning, soak the spots with a light solution of warm water and a detergent and use the brush, remove the remaining dirt (Fig. 12).

Rinse the surface with cold, fresh water (Fig. 13). Strong water jet shall remove all the dirt ,and detergent which might have remained on the air bag surface.

With the air bag in the upright position, wipe the nozzle using a clean cloth. Let the air bag dry.

Don't speed up drying by putting the air bag in a drier or close to a source of heat.

CHECKING, STORING AND PREVENTIVE MAINTENANCE

Adequate maintenance and care for air bags require more than cleaning after use. Air bags call for inspection, and preventive maintenance throughout the period of storage.

Check after use

1. When dry, check the air bag for eventual air blisters, notches or worn out segments that might have been hidden under the dirt. If you observe any damage or defect, mark it with a chalk, and consult the manufacturer or an authorised service agent.
2. Check the nozzle for any damage which could disable the connection. Replace the nozzle if necessary.

Storage

Air bags have to be stored at a dry, clean place without direct sun light and at room temperature. Take care of the filling connections not to damage them.

Preventive maintenance

Provided that an adequate care is taken of the air bags and that they are properly stored, there is practically impossible for the air bags and the inflation system to fail at use. Periodically check all the segments essential for operation, and clean them; wipe metal parts using a soft cloth, If you observe any damage of vital importance for the air bag's functioning, chalk it and consult the manufacturer or the nearest authorised service agent.

TECHNICAL DATA

Lifting force according to lifting height:

Diagram
10kN = 1t

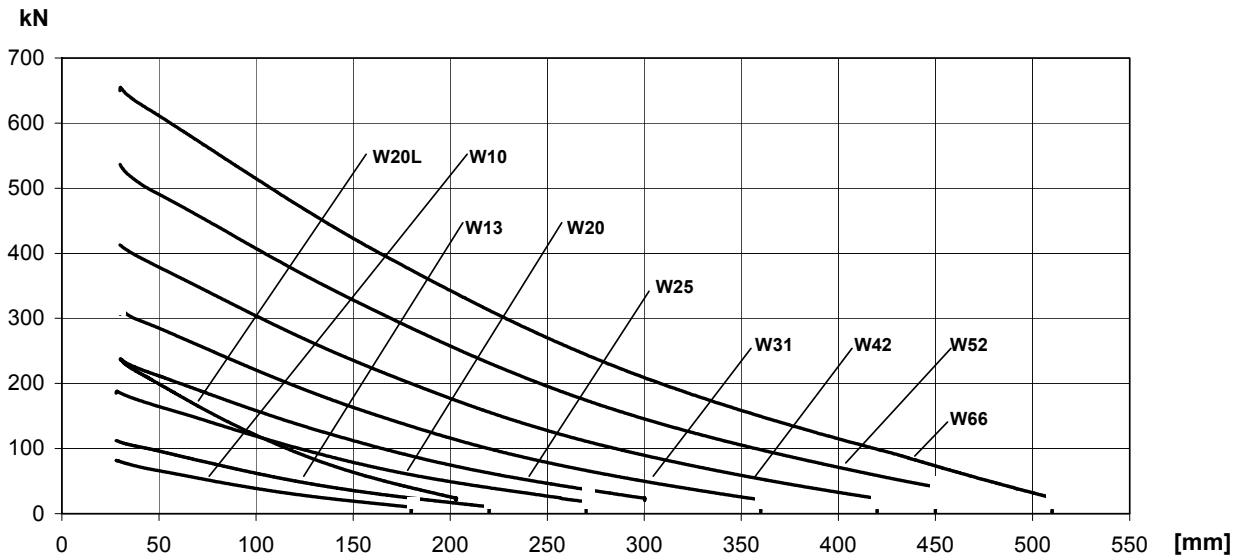
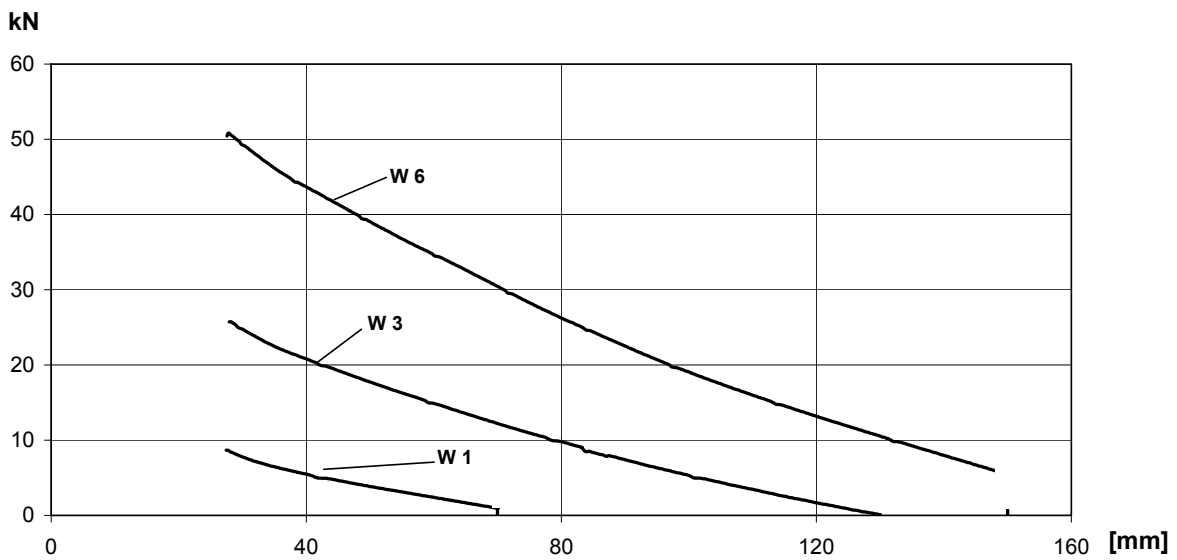


Diagram
10kN = 1t



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