

# Manual Webslings

1. Use of flat woven web slings in adverse conditions or hazardous applications.
2. The material from which the web slings are manufactured have selective resistance to chemicals. The resistance of man-made fibres to chemicals is summarised below:
  - a) polyester (PES ) is resistant to most mineral acids but is damaged by alkalis;
  - b) polyamides (PA) are virtually immune to the effect of alkalis; however, they are attacked by mineral acids;
  - c) polypropylene (PP) is little affected by acids or alkalis and is suitable for applications where the highest resistance to chemicals other than solvents is required.

Solutions of acids or alkalis which are harmless can become sufficiently concentrated by evaporation to cause damage. Contaminated slings should be taken out of service at once, soaked in cold water, dried naturally and referred to a competent person to examination. Slings with grade 8 Fittings and multi-leg slings with grade 8 master links should not be used in acidic conditions. Contact with acids or acidic fumes causes hydrogen embrittlement to grade 8 and grade 10 material. If exposure to chemicals is likely, the manufacturer or supplier should be consulted.

3. Flat woven webbing slings are suitable for use and storage in the following temperature ranges:
  - a) polyester and polyamide: -40 °C to 100 °C,
  - b) polypropylene: -40 °C to 80°C.

At low temperatures ice formation will take place if moisture is present. This may act as a cutting agent and an abrasive causing internal damage to the sling. Further, ice will lessen the flexibility of the sling, in extreme cases rendering it unserviceable for use. These ranges vary in a chemical environment, in which case the advice of the manufacturer or supplier should be sought. Limited indirect ambient heating, within these ranges, is acceptable for drying.

4. The man-made fibres from which the webbing is produced are susceptible to degradation if exposed to ULTRA-violet radiation. Flat woven webbing slings should not be exposed or stored in direct sunlight or sources of ULTRA-violet radiation.
5. Speciation of flat woven webbing slings in service. Before first use of the sling it should be ensured that: a) the sling corresponds precisely to that specified on the order; b) the manufacturer's certificate is to hand; c) the identification and WLL marked on the sling correspond with the information on the certificate.
6. Before each use, the sling should be inspected for defects and to ensure that the identification and specification are correct. A sling that is unidentified or defective should never be used, but should be referred to a competent person for examination.
7. During the period of use, frequent checks should be made for defects or damage, including damage concealed by soiling, which might affect the continued safe use of the sling. These checks should extend to any fittings and lifting accessories used in association with the sling. If any doubt exists as to the fitness for use, or if any of the required markings have been lost or become illegible, the sling should be removed from service for examination by a competent person. The following are examples of defects or damage likely to affect the fitness of slings for continued safe use:
  - a) Surface chafe. In normal use, some chafing will occur to the surface fibres. This is normal and has little effect. However, the effects are variable and as the process continues, some loss of strength should be expected. Any substantial chafe, particularly localized, should be viewed critically. Local abrasion, as distinct from general wear, can be caused by sharp edges whilst the sling is under tension, and can cause serious loss of strength.
  - b) Cuts. Cross or longitudinal cuts, cuts or chafe damage to selvage's, cuts to stitching or eyes.
  - c) Chemical attack. Chemical attack results in local weakening and softening of the material! This is indicated by flaking of the surface which may be plucked or rubbed off.
  - d) Heat or friction damage. This is indicated by the fibres taking on a glazed appearance and in extreme cases, fusion of the fibres can occur.
  - e) Damaged or deformed fittings.

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8. Correct selection and use of flat woven web slings. When selecting and specifying slings made from man-made fibres, consideration should be given to the required working load limit, taking in to account the mode of use and the nature of the load to be lifted. The size, shape, and weight of the load, together with the intended method of use, working environment and nature of the load, all affect the correct selection.

The selected sling should be both strong enough and of the correct length for the mode of use. If more than one sling is used to lift a load, these slings should be identical! The material from which the webbing is made should not be affected adversely by the environment or the load.

Consideration should also be given to ancillary fittings and lifting devices which should be compatible with the sling(s). The termination of the sling should also be considered i.e. whether fittings or soft eyes are required.

9. When using slings with soft eyes, the minimum eye length for a sling for use with a hook should be not less than 3,5 times the maximum thickness of the hook and in any event the angle formed in the eye of the sling should not exceed 20°.

When connecting a sling with soft eyes to a lifting appliance, the part of the lifting appliance which bears on the sling should be essentially straight, unless the bearing width of the sling is not more than 75 mm in which case the radius of curvature of the lifting appliance attachment should be at least 0,75 times the bearing width of the sling. Figure 1 illustrates the problem of accommodating webbing on a hook of radius less than 0,75 times the bearing width of the sling. Wide webbings may be affected by the radius of the inside of the hook as a result of the curvature of the hook preventing uniform loading across the width of the webbing.

10. Flat woven webbing slings should not be overloaded: the correct mode factor should be used, see WLL table (in front of this map). Working load limits for some modes may be given on the label. In the case of multi-leg slings the maximum angle to the vertical should not be exceeded.



NOTE Eye reinforcement not shown for clarity  
Figure 1 - Illustration showing inadequate accommodation of a webbing eye or a hook of too small radius

11. Good slinging practices should be followed: the slinging, lifting and lowering operations should be planned before commencing the lift
12. Flat woven web slings should be correctly positioned and attached to the load in a safe manner. Slings should be placed on the load such that the loading is uniform across their width. They should never be knotted or twisted. Stitching should never be placed over hooks or other lifting devices: the stitching should always be placed in the standing part of the sling. Damage to labels should be prevented by keeping them away from the load, the hook and the angle of choke.
13. In the case of multi-leg slings, the WLL values have been determined on the basis that the loading of the sling assembly is symmetrical. This means that when a load is lifted the sling legs are symmetrically disposed in plan -and subtended at the same angle to the vertical. In the case of 3 leg slings, if the legs are not symmetrically disposed in plan the greatest tension is in the leg where the sum of the plan angles to the adjacent legs is greatest. The same effect occurs in 4 leg slings except that the rigidity of the load should also be taken into account. NOTE With a rigid load the majority of the weight may be taken by only three, or even two, of the legs, with the remaining legs only serving to balance the load.

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14. Slings should be protected from edges, friction and abrasion, whether from the load or the lifting appliance. Where reinforcements and protection against damage from edges and/or abrasion is supplied as part of the sling, this should be correctly positioned. It may be necessary to supplement this with additional protection.
15. The load should be secured by the sling(s) in such a manner that it cannot topple or fall out of the sling(s) during the lift. Sling(s) should be arranged so that the point of lift is directly above the centre of gravity and the load is balanced and stable. Movement of the sling over the lifting point is possible if the centre of gravity of the load is not below the fitting point. When using basket hitch, the load should be secure since there is no gripping action as with choke hitch and the sling can roll through the lifting point. For slings which are used in pairs, the use of a spreader is recommended so that the sling legs hang as vertically as possible and to ensure that the load is equally divided between the legs. When a sling is used in choke hitch, it should be positioned so as to allow the natural (120°) angle to form and avoid heat being generated by friction. A sling should never be forced into position nor an attempt made to tighten the bite. The correct method of securing a load in a double choke hitch is illustrated in figure 2. A double choke hitch provides greater security and helps to prevent the load sliding through the sling.
16. Care should be taken to ensure the safety of personnel during the lift. Persons in the danger area should be warned that the operation is to take place and, if necessary, evacuated from the immediate area. Hands and other parts of the body should be kept away from the sling to prevent injury as the slack is taken up. Reference should also be made to ISO 12480-1 for planning and management of the lifting operation and the adoption of safe systems of working.



Figure 2 - Double choke hitch

17. A trial lift should be made. The slack should be taken up until the sling is taut: The load should be raised slightly and a check made that it is secure and assumes the position intended. This is especially important with basket or other loose hitches where friction retains the load. If the load tends to tilt, it should be lowered and attachments re-positioned. The trial lift should be repeated until the stability of the load is ensured.
18. Care should be taken when making the lift to ensure that the load is controlled, e.g. to prevent accidental rotation or collision with other objects. Snatch or shock loading should be avoided as this will increase the forces acting on the sling. A load in the sling or the sling itself should not be dragged over the ground or rough surfaces.
19. The load should be lowered in an equally controlled manner as when lifted. Trapping the sling when lowering the load should be avoided. The load should not rest on the sling, if this could cause damage and pulling the sling from beneath the load when the load is resting on it should not be attempted.
20. On completion of the lifting operation the sling should be returned to proper storage. When not in use, slings should be stored in clean, dry and well ventilated conditions, at ambient temperature and on a rack, away from any heat sources, contact with chemicals, fumes, corrosive surfaces, direct sunlight or other sources of ULTRA-violet radiation.

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21. Prior to placing in storage, slings should be inspected for any damage which may have occurred during use. Slings should never be returned damaged to storage.
22. Where lifting slings have come into contact with acids and/or alkalis, dilution with water or neutralization with suitable media is recommended prior to storage. Depending on the material of the lifting sling and on the chemicals referred to in remark 2, it may be necessary in some cases to request from the supplier additional recommendations on the cleaning procedure to be followed after the sling has been used in the presence of chemicals.
23. Slings which have become wet in use, or as the result of cleaning, should be hung up and allowed to dry naturally.
24. Examination and repair. Examination periods should be determined by a competent person, taking into account the application, environment, frequency of use and similar matters, but in any event slings should be visually examined at least annually by a competent person to establish their fitness for continued use. Records of such examinations should be maintained. Damaged slings should be withdrawn from service. Never attempt to carry out repairs to the 'slings yourself.