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Specification for Lifting twistlocks

Verrous tournants pour le levage

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Foreword

This British Standard has been prepared to standardize certain features of a component used in sets of four in lifting frames for lifting freight containers and certain other equipment. These components are generally known as lifting twistlocks, and are referred to as such in this standard.

This standard does not cover the design features of twistlocks which may be used for the location and restraint of containers on vehicles.

The lifting twistlock designs in this standard are compatible with freight containers which comply with the requirements of BS 3951 'Freight containers' (and of ISO 668 'Dimensions and ratings of freight containers') and which are equipped with corner fittings as specified in BS 4228 'Corner fittings for freight containers' (and in ISO/R 1161 'Corner fittings for series 1 freight containers').

The lifting twistlock provides a means of locking containers to a lifting frame suitable for automatic, semi-automatic or manual operating systems. Lifting twistlocks are associated with spigots which locate the twistlock in the corner fittings of the container, and the profiles of the twistlocks are such as to provide a degree of gather.

Four lifting twistlocks may also be used for occasionally lifting equally distributed loads equipped with corner fittings, such as hatch covers, sub-spreaders etc., which may be heavier than a fully laden ISO 1A container, but provided always that the rating of the twistlock is not exceeded.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

British Standard Specification for

Lifting twistlocks

1. Scope

1.1 This British Standard defines the head and adjacent portions of the shank and specifies dimensional requirements and material properties for lifting twistlocks used in conjunction with freight containers that comply with the requirements of BS 3951 (and of ISO 668) and are equipped with corner fittings as specified in BS 4228 (and in ISO/R 1161). Test load, rating and marking requirements are also specified.

1.2 Certain dimensions of the lifting twistlocks are specified on the assumption of correct spacing of the twistlocks in the lifting frame. It has therefore been necessary to state the centre distances which apply; for fixed centre twistlocks the tolerances on these distances are also given (see table 2). These dimensions and tolerances are based on ISO container and corner fitting dimensions. The method by which the tolerances were derived is given in appendix B to this standard. Appendix A outlines the factors to be considered in deducing the maximum imposed load on the twistlock.

The attachment of lifting twistlocks to their relevant supporting members is not covered nor are details of safety interlocks or position-indicating devices. The end of the shank and the method of attachment to the operating mechanism and spreader are not specified. They are at the discretion of the designer.

1.3 A suitable arrangement of spigots (or 'cellar pieces' or 'shear blocks') designed to locate the twistlocks in the corner fittings of a container and to protect the twistlock shafts is also recommended.

1.4 Although this standard does not specifically cover twistlocks of the type used for securement of containers to vehicles, the positioning of these may be deduced by the method given in appendix B.

2. References

The titles of the British Standards and International publications referred to in this standard are given on the inside back cover.

3. Types of lifting twistlocks

The following types of lifting twistlocks are specified.

3.1 Lifting twistlocks: fixed centres. These twistlocks are located at fixed centre distances in a lifting frame.

3.2 Lifting twistlocks: floating centres. These twistlocks are provided with a degree of both lateral and longitudinal movement or float to enable them to position themselves separately with respect to container corner fittings. In this case the twistlocks may be larger in certain dimensions. The method of achieving float should not significantly increase the likelihood of the load being taken on one side of the twistlock head only.

4. Form and dimensions

4.1 Lifting twistlocks. Form and dimensions of the head and adjacent shank area of lifting twistlocks shall be in accordance with figure 1 and table 1.

For twistlocks that are located at fixed centre distances in the lifting frame the dimensions shall be in accordance with the first line of table 1.

For twistlocks that are provided with horizontal movement or float the dimensions may be modified, depending on the amount of float provided, in accordance with the subsequent lines of the table. The twistlock dimensions, however, should not exceed those given in the last line of the table, which correspond with the minimum acceptable clearance in the container corner fitting for all possible positions of the twistlock.

Table 1. Minimum lateral and longitudinal float requirements for a range of twistlock dimensions

All dimensions in millimetres

Minimum lateral and longitudinal float per twistlock	Dimensions represented in figures 1 and 2 by:				
	<i>D</i>	<i>d</i>	<i>A</i>	<i>B</i>	<i>C</i>
0 (fixed)	$54^{+0.1}_{-0}$	53 to 53.1	$97^{+0}_{-0.5}$	$56^{+0}_{-0.25}$	48 nominal
1	$55^{+0.1}_{-0}$	53 to 54	$98^{+0}_{-0.5}$	57	49 nominal
2	$56^{+0.1}_{-0}$	53 to 55	$99^{+0}_{-0.5}$	58	50 nominal
3	$57^{+0.1}_{-0}$	53 to 56	$100^{+0}_{-0.5}$	59	51 nominal
4	$58^{+0.1}_{-0}$	54 to 57	$101^{+0}_{-0.5}$	60	52 nominal
5 or more	$59^{+0.1}_{-0}$	55 to 58	$102^{+0}_{-0.5}$	61	53 nominal

4.2 Corner locating spigots. A recommended form and dimensions for corner locating spigots for use in conjunction with lifting twistlocks are shown in figure 2.

NOTE 1. *Mounting*. The mounting of twistlocks should be such as to ensure that the head does not overhang the spigot when in the in-line (unlocked) position.

NOTE 2. *Spacing*. Dimensions between centres of fixed twistlocks when mounted on lifting frames should (using the notation in figure 3) comply with the relevant parts of table 2, or an equivalent table derived in a similar manner. (See appendix B.)

For floating twistlocks it should be noted that, although nominal centre-to-centre distances will remain as shown in table 2, tolerances must be deduced with due allowance for the amount of float.

Where the minimum amount of float is employed, the distances between centres about which float is introduced should have tolerances and allowable differ-

ences between diagonals similar to those applicable to the centres of fixed centre twistlocks.

5. Material

Lifting twistlocks shall be manufactured from steel forgings. It shall be the responsibility of the manufacturer to choose the material for the twistlock and ensure that the heat treatment given to the twistlock is suitable.

The material should be selected so that in the finished condition the minimum mechanical properties are equivalent to or better than those of steel 817M40, condition V, of BS 970 : Part 2. The tempering temperature shall be chosen so that impact values no lower than those quoted for steel 817M40, condition V, may be obtained throughout the range of temperatures likely to be encountered in service.

Table 2. Dimensions and tolerances between lifting twistlocks: fixed centres

Dimensions in millimetres (centre to centre)

Dimensions	Freight container size and ISO size designation			
	40 ft 1A and 1AA	30 ft 1B and 1BB	20 ft 1C and 1CC	10 ft 1D and 1DD
S_t^*	11985 ± 3.5	8918 ± 3.5	5853 ± 5.0	2786.5 ± 5.0
P_t	2259.5 ± 3.0	2259.5 ± 3.0	2259 ± 3.0	2259.5 ± 3.0
K	8.5	8.0	14.0	13.5

*If required, a slightly larger value may be given to the tolerance on S_t but in this case the value of K must be deduced (see examples given in B.3).

NOTE. *Rotational movement*. Lifting twistlocks should be arranged to rotate $90^\circ \pm 2^\circ$ about their own axis of symmetry and the longer axis of the head should be substantially at right angles to the longitudinal axis of the container when the twistlock is in the lifting position.