

Lifting points

A design guide

PUBLICATION 101

Edition 2

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THE ENGINEERING EQUIPMENT AND MATERIALS USERS' ASSOCIATION

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Edition 2

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ENGINEERING EQUIPMENT AND MATERIALS USERS' ASSOCIATION

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1. Introduction

1.1 Background

European Directive 2006/42/EC on machinery 'The Directive' came into force on 29 June 2006 within the European Union replacing European Directive 1998/37/EC. The provisions of the new Directive became applicable on 29th December 2009. The Directive contains guidelines on the design and construction of machines and lifting accessories which Member States have been required to transpose into national law.

This Publication was originally produced by the Engineering Equipment & Materials Users' Association, in the absence of any known international or national standard on the design of lifting points for plant and has been revised taking into consideration the Directive. This Publication supplements the documents listed under Section 2.1 Legislation and Regulatory Guidance which were produced by the UK Government when complying with the European Directive 1998/37/EC.

Lifting points are provided to facilitate lifting and handling of plant for installation/removal, maintenance and dismantling. The provision of adequate means for lifting is important for safe and efficient handling and to minimise risk of injury and damage.

1.2 Content

The design criteria for lifting points have a theoretical basis. This Publication specifies the design, fabrication, preferred types and marking of lifting points on plant. It defines the rated load for design purposes applicable to each lifting point and recommends the Safe Working Loads (SWLs) for associated lifting gear and appliances. Examples are given on the design of lifting points for multi-point lifting for various applications.

The lifting gear and appliance to be used should be taken into consideration early in the design stage of the lifting points. This is particularly important where shackles are to be used because there are two grades of shackle material available i.e. higher tensile and alloy steel which size for size have different SWLs.

The de-rating factors recommended for multi-leg slings are intended to take account of out-of-balance lifting where the total load may be taken by the opposing two legs of a leg sling or any two legs of a three-leg sling.

Lifting points are required for loads in excess of 55 kg in order to facilitate mechanical handling. Loads between 15 kg and 55 kg should be provided with facilities for controlled handling, e.g. handles or hand holes for one or more persons although the 15-55 kg load criteria can be adopted for any load below 55 kg if necessary.

Whilst the focus of this publication is on British legislation and standards, the reader may consider the general principles and practices to be applicable and useful elsewhere in the world.

2. Legislation, Standards and Related Documents

2.1 Legislation and Regulatory Guidance

Europe

European Directive 2006/42/EC on machinery.

Great Britain

Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

HSE ACOP L113 Safe use of lifting equipment publication.

The Provision and Use of Work Equipment Regulations 1998 (PUWER) No. 2306.

Simple guide to the Provision and Use of Work Equipment Regulations 1998.

2.2 Standards

International (ISO)

ISO 3266:2010 Forged steel eyebolts grade 4 for general lifting purposes.

European (EN)

EN 818-1-1996+A1:2008 Short link chain for lifting purposes. Safety. General conditions of acceptance.

EN 818-4:2008 Short link chain for lifting purposes. Safety. Chain slings. Grade 8.

EN 1677-5:2001+ A1 2008 Components for slings. Safety. Forged steel lifting hooks with latch. Grade 4.

EN 1993-3-1:2006 Eurocode 3. Design of steel structures. Towers, masts and chimneys. Towers and masts.

EN 13445 Unfired pressure vessels, CEN European Committee for Standardization.

EN 13889:2003 + A1:2008. Forged steel shackles for general lifting purposes. Dee shackles and bow shackles. Grade 6. Safety.

EN 14398 Cryogenic vessels - Large transportable non-vacuum insulated vessels.

British (BSI)

BS 3551:1962 Specification for alloy steel shackles.

BS 3643-1:2007 ISO metric screw threads. Principles and basic data.

BS 3643-2:2007 ISO metric screw threads. Specification for selected limits of size.

BS 4278:1984 Specification for eyebolts for lifting purposes.