Product Information Report

Eye Bolts

Overview

Eye bolts are threaded fasteners with a loop or an eye on one end. They are used to connect chain accessories to the workpiece. The workpiece will usually have tapped holes or through-holes that govern the location, size and number of eye bolts required for proper lifting.

Reference: Department of Energy Standard: DOE-STD-1090-2007, 12.4 Eye Bolts

Types of Eye Bolts

Wire Eye Bolts (also referred to as **Bent** or **Turned Eye Bolts**) are used for light-duty applications, and should not be used for overhead lifting and angular loads.

Makeshift Eye Bolts, made by welding washers or nuts to cap screws, should **NEVER** be used for overhead lifting.

Forged Eye Bolts come in two patterns, shouldered and unshouldered. Each pattern is available partially-threaded or fully-threaded. Fully-threaded shoulder-pattern eye bolts are called machinery eye bolts and are normally used in tapped holes.

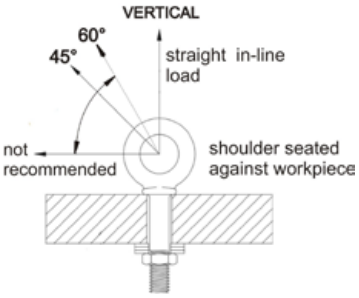
Forged Eye Bolts for rigging must be marked to show the manufacturer, size or rated working load limit.

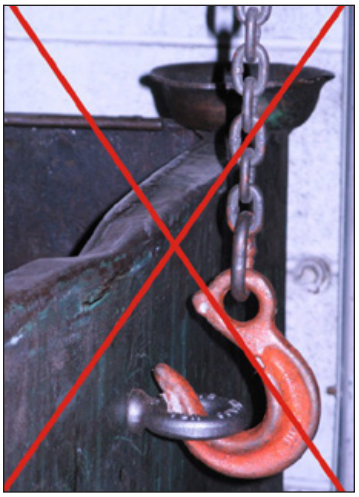
Tapered Eye Bolt | **Makeshift Eye Bolt** | **Unshouldered Eye Bolt** | **Shouldered Eye Bolt** | **Machinery Eye Bolt** | **Machinery Eye Bolt with Shoulder**

When to Remove an Eye Bolt from Service

- If the manufacturer identification, size or rated working load limit is worn out or unidentifiable
- If there are indications of heat damage or welding spatter
- If there are bent, distorted, stretched or cracked load-bearing components
- If there is a 10% reduction in dimension at any point around the body

Eye Bolt Usage





NEVER Load Out of Plane

Shoulder eye bolts are recommended whenever possible.

An angular lift places additional stress on an eye bolt above that of the load to be hoisted. For this reason, use of angular lifts should be avoided whenever possible.

Angular lifts

If the situation necessitates an angular lift, a properly-seated shoulder pattern eye bolt must be used and a reduction in the working load of the eye bolt must be applied. A shoulder eye bolt might need to be shimmed before final seating to achieve the in-line loading orientation necessary for use.

Straight eye bolts should only be used for in-line loads

A shoulder eye bolt with the shoulder not seated against the workpiece is rated the same as a straight eye bolt and should only be used for in-line loading.

If using in a tapped hole, the thread engagement should be at least 1-1/2 times the diameter of the thread.

Safe Working Load Limit

Stock Dia. (Inches)	Straight and Shoulder Pattern	Shoulder Pattern Only Based on Angle of Pull from the Horizontal		
	Vertical Load (Lbs.)	60°	45°	Less than 45°
1/4	500	Reduce vertical loads by 65%	Reduce vertical loads by 75%	NOT RECOMMENDED
5/16	800			
3/8	1,200			
1/2	2,200			
5/8	3,500			
3/4	5,200			
7/8	7,200			
1	10,000			
1-1/4	15,200			
1-1/2	21,400