LOAD TESTING & LIFT ENGINEERING

In today's business climate, the importance of reliable, verifiable load testing cannot be overstated. When your lift weighs hundreds or thousands of tons and is worth millions of dollars, you need rigging you can depend on—rigging that you know will lift the load and lift it safely. In short, you need load tested rigging. Most CERTEX locations are equipped with load test machines calibrated in accordance with ASTM E4 standards—with load accuracy of + / – 1% up to 3,000,000 lbs—and traceable to the National Institute of Standards and Technology (NIST).

150 ton load test of a custom-built anchor chain jack

235 ton load test of a 20 ft. (yellow) turbine-lifting spreader beam

Weights of Common Materials based on Volume

Material	Lbs. / ft.3
Aluminum	165
Brass	535
Copper	560
Iron	480
Lead	710
Steel	490
Tin	460
Brick masonry, common	125
Concrete, not reinforced	144
Concrete, steel reinforced	150
Ice	56
Snow, dry, fresh fallen	8
Snow, dry, packed	12-25
Snow, wet	27-40
Asphalt	80
Glass	160
Paper	60
Cedar & Spruce	22-28
Douglas Fir, seasoned	34
Douglas Fir, unseasoned	40
Hemlock, Pine, Poplar	30
Alcohol, pure	49
Gasoline	42
Oils	58
Water (8.3 lbs. / gal)	62
Earth	75-100
Sand & gravel	105-120
Crushed rock	90-110

LIFT ENGINEERING

CERTEX provides lift engineering services. Our in-house rigging engineers will design your lift to achieve the optimum balance of available equipment, safe working margins, and scheduling options. Additionally, we provide project drawings that show precise sling lengths and angles, and other critical path calculations.

Also available are custom designed lifting devices such as lift frames, spreader bars, and other fabricated lifting devices in accordance with all current ASME lifting standards.

TESTING USED RIGGING

CERTEX is often asked to load test various articles of used rigging. Customer objectives for such tests are varied. Many customers regularly test all rigging as a means of verification that the rigging can continue to perform as expected with respect to capacity. Other customers test used rigging as an integral part of their lift planning process, as a means of minimizing risk, and to ensure lift safety.

Probably the most common reason CERTEX is asked to load test used rigging is for the purpose of recertification—usually of a wire rope sling or a chain sling—that requires a new capacity tag. At first glance, this would appear to be a simple and straightforward process: put the item to be recertified in a load test machine and apply the appropriate test load. However, there is more to load testing used rigging than meets the eye.

First, the rigging must be visually inspected to determine if it is capable of surviving the test. For wire rope slings, this means looking carefully at the wire rope itself for defects such as broken wires, kinks, abrasion, corrosion, etc. Fittings attached to the sling must also be inspected to make certain they have not been deformed by overloading, side loading, or other forms of improper use. For chain slings, the inspection process is similar but more extensive. Each and every chain link must be inspected for proper grade number and for signs of wear, abrasion, overloading, and overheating. All fittings on the chain sling undergo inspection similar to that for fittings on wire rope slings.

Assuming a satisfactory inspection, the rigging can then be tested. If the sling was missing its original capacity tag, the question becomes, "What test load force should be applied?" In the case of a chain sling, this question is actually answered by the inspection. The links of all chain suitable for overhead lifting are embossed with a grade number that translates directly to a chain capacity rating.

In the case of a wire rope sling that is missing a capacity tag, the question of determining the sling's original capacity is much more problematic. There are three grades of steel used to manufacture wire rope, and each grade provides a different strength for slings. See the Wire Rope chapter for a discussion of the steel grades used to make wire rope and the Wire Rope Slings chapter for how these steel grades translate to sling capacity.

Unfortunately, there are no marks on wire rope that indicate which of the three steel grades was used to make the rope. **Thus, regardless of the condition of the wire rope sling or the original capacity of the sling, any wire rope sling that is missing its original capacity tag will be assumed to be made of the weakest of the three steel grades and can only be tested and re-tagged as such.**

TESTING CUSTOMER-MANUFACTURED RIGGING FITTINGS & ARTICLES

From time to time, CERTEX is asked to load test various articles of customer-manufactured rigging—such as specialized hooks, spreader beams, links, rings, swivels, and the like—for the purpose of determining the capacity of the article and labeling the article with a capacity that is both consistent with its design and manufacture and appropriate for its intended use.

Unfortunately, this is not a service that CERTEX can provide. Determination of the capacity of any article of manufactured rigging is a complex process that involves design, modeling of anticipated stresses, a thorough knowledge of strength of materials, fabrication processes and techniques, assembly, finishing techniques such as heat treating, selection of an appropriate design factor, and many other topics. Only a manufacturer who is thoroughly familiar with these disciplines can determine the capacity of an article of manufactured rigging.

For articles of customer-manufactured rigging, CERTEX can load test to a specific force and tag the article as having been tested to that force. In subjecting such an article to a load test, CERTEX does not warrant the condition or future operating capabilities of the article in any manner or certify the article for any specific use whatsoever. Responsibility for the design, manufacture, capacity rating, and proper and appropriate selection, use, and application of all articles of customer-manufactured rigging rests solely with the manufacturer and/or the end user.