ATLT-2510: SLING FABRICATION - FLAT WEB & CHAIN

Cuyahoga Community College

Viewing: ATLT-2510 : Sling Fabrication - Flat Web & Chain

Board of Trustees:
2015-12-03

Academic Term:
Spring 2019

Subject Code
ATLT - AIT-Lifting Technologies

Course Number:
2510

Title:
Sling Fabrication - Flat Web & Chain

Catalog Description:
Introducton to the layout and fabrication techniques for flat web slings and chain slings. Covers the calculations and sizing of various types of flat web and chain slings. Practical hands on learning of the techniques of layout and fabrication to manufacture flat web and chain slings and will cover basics of reading drawings, technical drawings, and prints.

Credit Hour(s):
1

Lecture Hour(s):
1

Requisites

Prerequisite and Corequisite
Departmental approval: admission to Lifting Technologies apprenticeship program.

Outcomes

Course Outcome(s):
Discuss the different types of flat web slings and describe the differences associated with each, including use/application and fabrication.

Objective(s):
1. List and define the terms related to flat web slings.
2. List the basic types of flat web slings.
3. Discuss the layout and fabrication of web slings.
4. Identify and configure various working load limits.

Course Outcome(s):
Demonstrate the ability to layout, configure & fabricate a flat web sling in accordance with a production work order (PWO).

Objective(s):
1. Interpret PWO to identify components required to fabricate a flat web sling.
2. Calculate flat web sling length to compensate for eye, overlap, and hooks.
3. Assemble, sew, and tag flat web sling.
4. Apply safety standards for sling fabrication in accordance with ANSI standards.

Course Outcome(s):
Discuss the different types of chain slings and describe the differences associated with each, include use/application and fabrication.

Objective(s):

1. List the basic types of chain slings.
2. Discuss the layout and fabrication of chain slings.
3. Identify and configure various working load limits.
4. List and define the terms related to chain slings.

Course Outcome(s):

Demonstrate the ability to layout, configure and fabricate a chain sling in accordance with production work order (PWO).

Objective(s):

1. Interpret the PWO to identify the components required to fabricate a chain sling.
2. Calculate the chain length to compensate for hooks, links, and connectors.
3. Set up and safely operate the equipment and machinery needed for chain sling fabrication.
4. Tag and Test chain sling for required load capacity in accordance with industry standards.

Methods of Evaluation:

1. Participation
2. Assignments
3. Quizzes & Exams
4. Practical application projects

Course Content Outline:

1. Flat Web Basic Sling Types
    a. Terminology
        i. Type I - TC
        ii. Type II - TT
        iii. Type III
        iv. Type IV
        v. Type V
        vi. Type VI
        vii. Abrasion
        viii. Body
        ix. Loop Eye
        x. Plies
        xi. Rated Capacity (Working Load Limit)
        xii. Design Factor
        xiii. Vertical
        xiv. Choke
        xv. Basket
        xvi. Splice
        xvii. Wear Pad
        xviii. Yarn
        xix. Webbing
        xx. Thread
        xxi. Tapered Eye
    b. Flat Web Sling Types
        i. Type I – TC
            1. Fittings
                a. Triangle
                b. Choker
            2. Uses
                a. Vertical
                b. Choke
                c. Basket
        ii. Type II – TT
            1. Basket Hitch
            2. Vertical
        iii. Type III

1. Flat Loop Eye
2. Same Plane Eye Opening
3. Vertical, Choker, Basket

iv. Type IV
1. Eye Configuration
2. Twisted Eye Sling
3. Limited Use
4. Choking Availability

v. Type V
1. Endless Web Sling
2. Grommet
3. Continuous Loop
4. Special Application
5. Non Marring

vi. Type VI
1. Return/Reverse Eye
2. Wear Pads

c. Sling Layout and Fabrication
i. Layout
1. Bill of Material
2. Sling Type
3. Capacity Chart

ii. Fabrication
1. Safety
2. Tools
3. Equipment
4. Packaging

d. Working Load Limit
i. Identification
1. Industry Standards
2. Tag
3. Special Limits

ii. Configuration
1. 1-ply
2. 2-ply
3. 3-ply
4. 4-ply
5. Customer requests

2. Flat Web Sling Fabrication
a. PWO interpretation
i. Component Identification
ii. Bill of Material
1. Labor
2. Web
3. Tag
4. Hooks/Links

iii. Special Notes
1. Color
2. Name
3. Customization

b. Calculations
i. Measurements
ii. Component Compensation
iii. Lap

c. Assembly
i. Sew
1. Thread
2. Polyester

3. Nylon
4. Needle

ii. Tagging
1. Placement
2. Load Capacity
3. Manufacture Identification
4. Description
5. Warning

d. Safety Standards
i. ANSI
ii. ISO

3. Chain Types Application and Fabrication
a. Terminology
i. Alloy
ii. Grade
iii. Single
iv. Double
v. Triple
vi. Quad
vii. Heat Treat
viii. Links
ix. Working Load Limit
x. Masterlink
xi. Grab Hook
xii. Sling Hook
xiii. Foundry Hook
xiv. Lode Lok Hook
xv. Hammerlock
xvi. Clevis

b. Chain Sling Types
i. Single Leg “S”
ii. Double Leg “D”
iii. Triple Leg “T”
iv. Quad Leg “Q”
v. Metal Mesh Slings

c. Layout and Fabrication
i. Layout
1. Component Compensation
2. Link Size
3. Tag

ii. Fabrication
1. Cut Table
2. Link Closer
3. Weld
4. Heat Treat
5. Test

d. Working Load Limits
i. Hook/Link Verification
ii. Grade of Steel
iii. Component Load Limit

4. Chain Fabrication
a. PWO Interpretation
i. Bill of Material
ii. Special Customer Requests
iii. Configurations

b. Component Compensation
i. Hook Length
ii. Master link Length
iii. Connectors

c. Equipment Operation
   i. Machine Type
      1. Plasma Cutter
      2. Link Closer
      3. Welder
      4. Heat Treater
      5. Hydraulic Tester
   ii. Safety Concerns
      1. Burns
      2. Flashing
      3. Pinch Points
      4. Crane Safety
      5. PPE
d. Chain Assembly
   i. Industry standards and requirements
      1. ASME
      2. ISO
   ii. Manufacturers recommendations
   iii. End user requirements
e. Tagging and Testing
   i. Working Load Limit
   ii. Industry standards and requirements

Resources

Mazzella Lifting Technologies. *Mazzella ISO 9001:2008 Quality Training Materials.* 6th ed. Cleveland, OH: Mazzella Lifting Technologies, 2013.

Web Sling Tie down Association. *Recommended Standard Specifications for Synthetic Web Slings.* Fourth ed. Forest Hill: Web Sling Tie down Association, 2004.

ASME B30.9-2006. *Slings - Safety Standards for Cableways, Crane, Derrick, Hoists, Hooks, Jacks, and Slings.* New York: The American Society of Mechanical Engineers, 2007.

Resources Other

1. http://www.mazzellalifting.com/
2. http://www.wstda.com/index.cfm
3. https://www.asme.org/

Instructional Materials:

1. Mazzella Companies - **Introduction to Lifting & Rigging:** *Rigging Basics* Student Edition; 2015
2. Mazzella Companies Technical Manual and Commercial Product Catalog – 2013
3. Mazzella Companies Working Load Limit Pocket Guide – 2013

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