

SECTION 15090 - HANGERS, SUPPORTS AND ANCHORS

PART 1 – GENERAL

1.1 SUMMARY

- A. This section specifies hangers, supports and anchors for use in piping systems specified in other sections of these specifications.

1.2 REFERENCES

- A. UL and FM Compliance: Provide products which are Underwriters Laboratories listed and Factory Mutual approved.
- B. Standard Compliance: Provide products which comply with Manufacturers Standardization Society's (MSS) MSS SP-69, for type indicated.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Horizontal-Piping Hangers and Supports:
 - 1. General: Provide factory-fabricated horizontal piping hangers and supports of MSS type and size indicated, bolts (if any) and washers; comply with MSS SP-58 and manufacturer's published product information. Where MSS type or size is not indicated, comply with MSS SP-69 and manufacturer's published product information; size hangers and supports properly for piping, including insulation (if any).
 - 2. Adjustable Clevis Hanger: MSS Type 1, fabricated from steel.
 - 3. Adjustable Band Hanger: MSS Type 7, fabricated from steel.
 - 4. Adjustable Swivel-Band Hanger: MSS Type 10.
 - 5. Clamp: MSS Type 4.
 - 6. Double-Bolt Clamp: MSS Type 3, including pipe spacers.
- B. Vertical-Piping Clamps:
 - 1. General: Provide factory-fabricated vertical-piping clamps of type and size indicate; comply with manufacturer's published product information. Where type or size is not indicated, comply with manufacturer's published product information. Size clamps properly for piping, including insulation (if any).
 - 2. Two-Bolt Riser Clamp: MSS Type 8.
- C. Hanger-Rod Attachments:
 - 1. General: Provide factory-fabricated hanger-rod attachments of type and size indicated; comply with manufacturer's published product information. Where type or size is not indicated, comply with manufacturer's published product information. Size attachments properly for piping, including insulation (if any).
 - 2. Turnbuckles: MSS Type 13.
 - 3. Weldless Eye-Nut: MSS Type 17.
 - 4. Malleable Eye-Socket: MSS Type 14.
 - 5. Clevises: MSS Type 14.
- D. Building Attachments:
 - 1. General: Provide factory-fabricated building attachments of type and load-rating indicated; comply with manufacturer's published product information. Where type or load-rating is not indicated, comply with manufacturer's published product information. Size units properly for the piping loading.
 - 2. Concrete Inserts: MSS Type 18, steel.
 - 3. Top Beam C-Clamp: MSS Type 19.
 - 4. Steel C-Clamps: MSS Type 23, steel.

5. Malleable Iron C-Clamps: MSS Type 23, malleable iron.
6. Single-Side Clamp: MSS Type 25.
7. Top I-Beam Clamp: MSS Type 25.
8. Side Beam Clamp: MSS Type 20.
9. Beam Clamp/Eye-Nut: MSS Type 28.
10. Wide-Flange Beam Clamp/Eye-Nut: MSS Type 29.
11. Beam Clamp/Extension Piece: MSS Type 30.

E. Saddles and Shields:

1. General: Provide factory-fabricated saddles and shields of MSS type and size indicated; comply with MSS SP-58 and manufacturer's published product information. Where MSS type or size is not indicated, comply with MSS SP-69 and manufacturer's published product information. Size saddles and shields properly for insulation and vapor barrier (if any).
2. Protection Saddles: MSS Type 39.
3. Protection Shields: MSS Type 40.

2.2 ACCESSORIES

- A. Metal Framing: Provide products complying with NEMA STD ML 1.
- B. Steel Plates, Shapes and Bars: Provide products complying with ASTM A 36.
- C. Cement Grout: Portland cement (ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ASTM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum amount of water required for placement and hydration.
- D. Heavy Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS standards.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Proceed with installation of hangers, supports and anchors only after required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) proper placement of inserts, anchors and other building structural attachments.
- B. Prior to installation of hangers, supports, anchors and associated work, Installer shall meet at project site with Contractor, installer of each component of associated work, inspection and testing agency representatives (if any), installers of other work requiring coordination with work of this section and Construction Manager for purpose of reviewing material selections and procedures to be followed in performing the work in compliance with requirements specified.

3.2 INSTALLATION

- A. Install building attachments at required locations within concrete or on structural steel for proper piping support. Space attachments in accordance with maximum spacing listed on table at the end of this section. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi is indicated, install reinforcing bars through openings at top of inserts. Prior to placing concrete, install nut in insert and screw threaded rod through nut until rod is firmly against top of insert body.
- B. Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal piping to be supported with maximum spacings. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Support spacing shall be in accordance with maximum spacing

listed on table at the end of this section. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

- C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.
- D. Support fire sprinkler piping independently of other piping.
- E. Prevent galvanic action in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.
- F. Prevent contact with and isolate copper or galvanized pipe from contact with pressure treated lumber or blocking and concrete or masonry work.
- G. Provisions for Movement:
 1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
 2. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
 3. Insulated Piping: Comply with the following installation requirements.
 4. Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.
 5. Shields: Where low-compressive-strength insulation or vapor barriers are indicated on cold water piping, install coated protective shields. For pipe 8" and over, install wood insulation saddles.
 6. Saddles: Where insulation without vapor barrier is indicated, install protection saddles.

3.3 INSTALLATION OF PIPE HANGERS:

- A. Space hangers and supports to prevent sagging and reduce strain on valves and specialties with spacing no greater and rod no smaller than shown in the following table. Hangers shall allow for expansion and contraction.
- B. Cast iron piping:

Diameter of Pipe	Maximum Spacing	Rod Size
2" and 3"	Each joint	3/8"
4" and 5"	Each joint	1/2"
6" and 8"	Each joint	3/4"
10" thru 15" (two hangers)	Each joint	3/4"
- C. PVC piping:

All Sizes	4 ft	1/2"
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- D. Painting of Base Supports: Refer to painting work sections of these specifications.
- E. Adjustment of Hangers and Supports:
 1. Adjust hangers and supports and place grout as required under supports to bring piping to proper levels and elevations.

END OF SECTION 15090