

SECTION 12 31 00.3

(FORMERLY 12310.1)

FLEXIBLE LABORATORY FURNITURE CORE AND CART SYSTEM (SIGMA FLEX)

PART 1 – GENERAL

Summary:

This specification identifies the minimum material and construction standards that are required to deliver a quality installation of the flexible laboratory furniture system. Laboratory furniture shall be supplied in accordance with the requirements of this specification. The laboratory furniture identified in this specification shall include the miscellaneous metal panels and other related components as identified on the drawings and that are necessary for the complete installation.

1.1 SECTION INCLUDES

- A. Fixed island and wall cores
- B. Fixed wall rails
- C. Mobile flexible carts
- D. Cantilevered work surface frames
- E. Shelves
- F. Suspended cabinets

1.2 RELATED SECTIONS

- A. Division 06 Section 10 00, "Rough Carpentry"
- B. Division 06 Section 40 00, "Architectural Woodwork"
- C. Division 09 Section 65 13, "Resilient Base and Accessories"
- D. Division 11 Section 53 00, "Laboratory Equipment"
- E. Division 12 Section 36 00, "Countertops"
- F. Division 12 Section 35 53, "Manufactured Metal Casework"
- G. Division 12 Section 32 00, "Manufactured Wood Casework"
- H. Division 22 Section 40 00, "Plumbing Fixtures"
- I. Division 26 Section 05 00, "Common Work Results for Electrical"

J. Related Work To Be Performed By Others:

1. Final installation of all plumbing, service and electrical fixtures attached to service carriers.
2. Final connection to service lines of all plumbing, service and electrical fixtures attached to service carriers.

1.3 REFERENCES

- A. SEFA 10: Adaptable Laboratory Furniture Systems Recommended Practices
Science Equipment and Furniture Association (SEFA)
- B. ISO 9001:2015 – Quality Management
International Standards Organization (ISO)
- C. ADA (ATBCB ADAAG) Americans with Disabilities Act Accessibility Guidelines
Americans with Disabilities Act (ADA)

1.4 SUBMITTALS

Refer to Section 01 33 00, "Submittal Procedures," for requirements, procedures, etc.

A. Product Data:

Drawings shall include data and details for construction of the laboratory furniture as well as information regarding the name, quantity, type and construction of materials (such as hardware, gauges, etc.), that will be used to complete the project.

B. Shop Drawings:

1. The laboratory furniture manufacturer shall furnish shop drawings illustrating the layout and placement of all laboratory furniture, casework and fume hoods as well as any products included in this section.
2. Indicate the type and location of all service fittings and associated supply connections.
3. Preparation instructions and recommendations.
4. Storage and handling requirements and recommendations.
5. Installation methods.

C. Selection Samples: **[Delete if colors have already been selected]:**

Submit one complete set of color chips representing the manufacturer's full range of available colors. Minimum sample size 2-1/2 inches by 2-1/2 inches (63.5mm x 63.5mm).

D. Quality Assurance/Control:

1. Design Data/Test Reports: Manufacturer shall submit test data and design criteria which are in compliance with the project specifications.
2. Certificates: All certifications required in the specifications shall be submitted with the original submittal package under separate cover. Certificates must be provided with the signature of a qualified individual of the supplier.
3. Manufacturers' Instructions: Provide manufacturer's instructions for installation and maintenance of all products provided and installed within this section.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

The following list of information will be provided to the Architect at least ten (10) days prior to the bid opening:

1. List of manufacturing facilities.
2. ISO 9001 Registered Quality Management System.
3. A list of ten (10) installations of comparable stature completed within the past five (5) years.
4. Construction details depicting the materials, sizes and methods of construction.

1.6 DELIVERY, STORAGE AND HANDLING

A. Packaging, Shipping, Handling and Unloading:

1. Packaging: Products shall have packaging adequate enough to protect finished surfaces from soiling or damage during shipping, delivery and installation.
2. Delivery: Furniture delivery shall only take place after painting, utility rough-ins and related activities that could otherwise damage, soil or deteriorate furniture in installation areas are completed.
3. Handling: Care, such as the use of proper moving equipment, experienced movers, etc., shall be used at all times to avoid damaging the furniture. Until installation takes place, any wrapping, insulation or other method of protection applied to products from the factory will be left in place to avoid accidental damage.

B. Acceptance at Site:

Furniture will not be delivered or installed until the conditions specified under Part 3, Installation section of this document have been met.

C. Storage:

Furniture shall be stored in the area of installation. If, prior to installation, it is necessary for furniture to be temporarily stored in an area other than the installation area, the environmental

conditions shall meet the environmental requirements specified under the Project Site Conditions article of this section.

D. Waste Management and Disposal:

The supplier of the laboratory furniture is responsible for removing any waste or refuse resulting from the installation of, or work pertaining to laboratory furniture; thereby leaving the project site clean and free of debris. Trash container(s) are to be provided by others.

1.7 PROJECT SITE CONDITIONS

- A. Building must be enclosed (windows and doors sealed and weather-tight).
- B. An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place.
- C. Adjacent and related work shall be complete.
- D. Ceiling, overhead ductwork and lighting must be installed.
- E. Site must be free of any further construction such as "wet work".
- F. Required backing and reinforcements must be installed accurately and the project must be ready for casework installation.

1.8 WARRANTY

- A. Furnish a written warranty that work performed under this section shall remain free from defects as to materials and workmanship for a period of two (2) years from date of shipment. Defects in materials and workmanship that may develop within this time are to be replaced without cost or expense to the Owner.

Defects include, but are not limited to:

- 1. Ruptured, cracked, or stained coating
- 2. Discoloration or lack of finish integrity
- 3. Cracking or peeling of finish
- 4. Slippage, shift, or failure of attachment to wall, floor, or ceiling
- 5. Weld or structural failure
- 6. Warping or unloaded deflection of components
- 7. Failure of hardware

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturer:

1. Mott Manufacturing Ltd.as distributed by **New England Lab®** (NEL).
 - i. Boston Corporate Offices - 1 Arrow Drive Woburn, MA 01801
 1. (888) 635-2080
 - ii. Baltimore Office - 2707 N. Rolling Road Suite 110 Baltimore, MD 21244
 1. (410) 944-7060
 - iii. North Carolina Office - 2175 Presidential Drive Suite 130 Durham, NC 27703
 1. (919) 469-8054
 - iv. For pricing - info@newenglandlab.com
 - v. For product questions – Rand Weyler - rand@newenglandlab.com

B. Substitutions:

Must meet all specification requirements and have prior approval.

2.2 SIGMA FLEX CORE MATERIALS

A. Sheet Steel:

Mild steel, cold rolled furniture grade to requirements of ASTM A1008/A1008M, Grade C or higher, with smooth surfaces to furniture quality.

B. Galvanized Sheet Steel:

Commercial quality galvanised sheet steel to ASTM 653, Designation Z275.

C. Stainless Steel:

1. Sheet: ASTM A240, Type 304 and 316 alloy.
2. Finish: Unless otherwise indicated, AISI No. 4 brushed finish.

2.3 DESIGN REQUIREMENTS:

- A. Support systems shall be a core and panel style support structure.
- B. Core systems with 12” depths can be supported by anchoring to suitable flooring material or may be supported by structural end gables (outrigger legs).
- C. Core systems with 3.25” to 6” depths can be supported by anchoring to suitable flooring material along with perpendicular core or end gable supports or structural support from above.
- D. 8.75” wall cores or rails can be supported by fastening to structural walls that have sufficient blocking in them.

- E. Modular components shall be suitable for single faced wall cores or double-faced peninsula or island configuration.
- F. Core assemblies of 6" to 12" depths shall have removable panels on all sides for service access and routing.

2.4 CONSTRUCTION

A. General Fixed System Construction:

Nominal core dimensions:

1. Widths: 24", 30", 36", 42", 48", 54", 60", 66", 72"
2. Heights: 34.75", 45.75", 85"
3. Material thicknesses:
 1. Uprights: Minimum 16 Ga. (0.059")
 2. Floor anchoring angles: Minimum ¼" thick
 3. Fixed base and raised core panels: Minimum 18 Ga. (0.048")
 4. Structural mid supports: Minimum 14 Ga. (0.074")
 5. Removable panels: Minimum 18 Ga. (0.048")
4. Core or wall system shall support work surfaces, under counter cabinets and overhead storage components.
5. Structural core systems may be configured for floor anchor alone or additional support legs may be used if floor attachment is not of sufficient strength for cantilever support.
6. Core system allows plumbing, electrical and other services to be installed using commonly available mounting systems.
7. All access panels shall be fastened with positive friction catch which snap into place. Panel attachment system shall not rely on adhesives or hook and loop fasteners. Panels shall be half width and it shall be possible to remove panels without removing suspended cabinets.
8. Vertical height of table work surfaces, upper storage units and shelves can be adjusted in one inch increments without the use of special tools.
9. It shall be possible to remove and relocate suspended cabinets without disturbing the countertop.
10. It shall be possible to install open shelving both above and below work surface. Shelves located above and below work surface shall be interchangeable.

11. Upper storage cabinets shall be adjustable vertically and laterally and shall be removable.

B. Fixed 12" Island Core:

1. Nominal core depth: 12"
2. 3.25" deep uprights with 5.5" service space between.
3. Four leveling bolts and four holes for floor anchoring angles to be level and secure on floor.
4. Top horizontal support: Minimum 18 Ga. (0.048").

C. Fixed 8" Wall Core:

1. Nominal core depth: 8.75"
2. 3.25" deep uprights with 5.5" service space to wall.
3. Two leveling bolts and two holes for floor anchoring angles to be level and secure on floor.
4. Wall mounting bracket located at floor height to be a minimum of 14 Ga. (0.074").
5. Top horizontal support: Minimum 18 Ga. (0.048")

D. Fixed 3" Panel System:

1. Nominal core depths: 3.25"
2. Two leveling bolts and two holes for floor anchoring angles to be level and anchor to floor.
3. Top horizontal support: Minimum 16 Ga. (0.059")

E. Fixed 6" Panel System:

1. Nominal core depths: 6"
2. Four leveling bolts and four holes for floor anchoring angles to be level and secure on floor.
3. Service space in lower uprights of 3.25" x 10".
4. Top horizontal support: Minimum 18 Ga. (0.048")

F. Mobile Carts:

1. Width: 24", 30", 36", 42", 48", 54", 60", 66", 72"

2. Depth: 23", 29" (to accept 30" or 36" deep counter tops)
3. Height: 35.75", 78"
4. Casters: Four per cart assembly. 4" x 1.25" wheels with grey non-marking tire. Each caster shall have a 300 pound load rating. All casters shall be equipped with a total lock (locks both wheel rotation and caster swivel). Casters shall be attached to extreme corners of the cart base by threading into welded threaded inserts.

[OR]

5. Nylon based levellers shall be attached to extreme corners of the cart base by threading into welded threaded inserts.

[OR]

6. Optional levelling casters shall only be provided where shown on the drawing. Levelling casters shall use a shock absorbing pad to raise the caster off the floor. Levelling pad shall be applied using a fine thread finger rotated knob that extends the pad down. Levelling casters and pads shall be rated for 330 lbs each.

[OR]

7. Casters with supplementary levellers: Casters shall be 4" x 1.25" wheels with grey non-marking tire. Each caster shall have a 300 pound load rating. All casters shall be equipped with a total lock (locks both wheel rotation and caster swivel). Casters shall be attached to extreme corners of the cart base by threading into welded threaded inserts. Nylon based levellers shall be threaded into the bottom of tube standoffs. Supplementary levellers shall only be provided where shown on the drawing and be located behind the front casters and between the rear casters.
8. Cart base assembly shall be fabricated from 1.5" x 3" rectangular tube steel of 16 gauge wall thickness. Base shall be welded together with neat, professional MIG weld fillets. For maximum strength, fillets shall be left unground. Mobile cart base shall be in a "C" shape with two members across the back and one member at each end. Cart base shall be open at front to allow knee space for seated users. Vertical upright attachment members of 24" in length shall be welded to each end of the "C" shaped base. All open tube ends shall be plugged with black polyethylene plugs.
9. Tall slotted vertical uprights (78" high) shall contain shelf bracket and countertop support frame slots that are set behind the front face of the upright by a minimum of 1/4". Slotted uprights shall be bolted to vertical upright attachment members using four 5/16" socket head cap screws. Screws shall be concealed beneath snap in plugs.
10. Short slotted vertical uprights (34.75" high) shall contain shelf bracket and countertop support frame slots. Slots are set behind the front face of the upright by a minimum of 1/4". Slotted uprights shall be bolted to vertical upright attachment members using four 5/16" socket head cap screws. Screws shall be concealed beneath snap-in plugs. Uprights shall be designed to be capable of accepting upper upright members for future flexibility.

[OPTIONAL]

11. Double pair of uprights where shown on drawings shall provide split width shelves and countertop support frames to be hung from cart.

12. Modesty panels shall span and brace the uprights together preventing the uprights from being able to sway.
13. All hanging components attached to vertical uprights shall be adjustable in 1" increments.
14. Vertical uprights shall accept shelves, cantilevered work surface support frames, suspended casework and upper storage cabinets designed for other furniture in the same series (Mott Manufacturing's Sigma Flex Systems).

G. Cantilevered work surface frame:

1. Depths: 23", 29"
2. Frame shall engage uprights with nine hooks per side. The frame shall be fitted with levelling bolts which allows the frame angle to be adjusted for proper alignment of front work surface edge.
3. Horizontal rails spanning between the side arms shall be capable of suspending cabinets.
4. Frame of 23" depth shall be at minimum 4" wider than suspended cabinets to allow clearance for rear side frame supports. Cantilevered counter top support frames on 29" deep carts shall be able to suspend products of equal width to the support frame.
5. Front tube ends shall be plugged with black polyethylene plugs.

H. Shelves:

1. Shelves shall be constructed of 20 Ga. sheet steel. Front and rear shall be turned down 1" and return by 5/8". The sides shall be turned down by 1" and return by 1" for fastening to shelf brackets.
2. A minimum 5" deep, 20 gauge hat channel shall be spot welded to the middle of each shelf.

I. Suspended Base Cabinets and Wall Cabinets:

1. Design and construction shall be as in section 12 35 53 Laboratory Metal Casework.
2. Suspended cabinets shall be supported using hook shaped rails attached near the front and rear of the cabinets. It shall be possible to remove and relocate a fully loaded cabinet to any position between legs.
3. Suspended Wall Cabinets: Provide a system of cold-rolled steel hanger rails attached to the casework frames. System shall allow height adjustment in 1" increments. Rails spanning between uprights designed for hanging wall cabinets shall be installed mount cabinets. Installation and removal to be accomplished without the use of tools.

J. Load ratings

1. Fixed island core assemblies of 85" high and 12" deep shall support components on either side of the assembly. Components to be supported include cantilevered support frames, upper storage units and shelves. Each component has an individual maximum load, but total load shall not exceed 2820 lbs.
2. Fixed wall panel assemblies of 85" high and 8.75" deep shall support components on one side of the assembly. Components to be supported include a cantilevered support frame, upper storage units and shelves. Each component has an individual maximum load, but total load shall not exceed 1680 lbs.
3. Fixed island core assemblies of 85" high and 3.25" or 6" deep shall support components on either side of the assembly. Components to be supported include cantilevered support frames, upper storage units and shelves. Each component has an individual maximum load, but total load shall not exceed 2280 lbs.
4. Fixed wall rail assemblies 79" high shall support cantilevered support frames, upper storage units and shelves. Each component has an individual maximum load, but total load shall not exceed 760 lbs, including 400lbs on the cantilevered countertop frame, and 360 lbs above countertop frame.
5. Fully assembled 78" high mobile cart shall support cantilevered support frames, upper storage units and shelves. Each component has an individual maximum load, but total load shall not exceed 900 lbs.
6. Cantilevered support frames shall support 600 lbs per cart (includes weight of work surface and suspended cabinets (if any). An exception to this is on fixed wall rails where the rails reduce the cantilevered support frame to 400 lbs. The option for supplementary adjustable legs increases the load capacity to 1000 lbs per frame.
7. Shelves shall support the following maximum loads dependent on the shelf depths:
 - a. 6" to 12" deep shelves - 180 lbs evenly distributed
 - b. 18" deep shelves - 130 lbs evenly distributed
 - c. 24" deep shelves - 100 lbs evenly distributed
8. Cabinets that are suspended from cantilevered support frames shall have a maximum load rating of 300lbs (includes the weight of the cabinet).
9. Wall cabinets being suspended from the rear uprights shall have a maximum load rating of 300lbs (includes the weight of the cabinet).

K. Accessories

1. Aluminum Slat Rail (toolbar)
 - A. Provide a 3 ¾" high by 1" thick anodized extruded aluminum dual channel slatwall rail. Rail shall be sized to fit between uprights. Basis of Design: Novus slatwall rails by Dahle North America.

- B. Rails may be mounted so that the face of the rail is flush with the face of the uprights, or so that the rear of the rail is flush with the face of the uprights. Either shall be accomplished with the same mounting bracket and hardware, and additional molded plastic inserts shall be provided to finish the ends of the rails when rail ends are exposed.
- C. Mounting bracket shall engage both slots in the slatwall rail, and have tooth pattern to match the slotted upright system. Provide set screw to engage into empty slot and prevent bracket from lifting up or being removed when engaged.
- D. Provide t-nut mounting hardware and required hex bolts to fasten bracket to slat rail.
- E. [Monitor Arm: Provide slatwall-mounting monitor arm that engages double slots on rail, and is tightened to the rails with a single top-mounted hex head bolt. Swivel range of 180 degrees. Provide quick release monitor mounting bracket with 75mm and 100mm mounting options. Suitable to support monitors 4.5lbs to 15lbs with a gas technology spring. Basis of Design Novus Clu 1]

2.7 STEEL FURNITURE FINISH

Metal finish to be as in Appendix 1 - Laboratory Steel Furniture Finish.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install casework within system, align and set level with levelling devices, in accordance with shop drawings.
- B. At wall locations secure wall cabinets to face of finished walls and partitions, applying self-tapping screws through wall finish material into each concealed stud flange.
- C. Install components to affect a secure, neat and complete installation.

END OF SECTION