
NAVFAC IGS-15050 (JUNE 2002)

Preparing Activity: LANTNAVFACENGCOM Based on UFGS-15050N

ITALIAN GUIDE SPECIFICATIONS

Use for ITALIAN projects only

SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

06/02

NOTE: This guide specification is issued by the Atlantic Division, Naval Facilities Engineering Command for regional use in Italy.

NOTE: This guide specification covers the mechanical general requirements for all sections of Division 15, "Mechanical". This guide specification can be applied to other divisions of the project specification.

Comments and suggestion on this specification are welcome and should be directed to the technical proponent of the specification. A listing of the technical proponents, including their organization designation and telephone number, is on the Internet.

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ITALIAN LAWS AND NORMS (D.M.)(LAW)(CIRC.)

NOTE: Italian laws and normatives are the legislative regulations and decrees issued by the

Italian government in the form of laws, norms, decrees, circulars, and letters. These Laws and Decrees concur together with Norms and Standards in forming the governing directives for construction.

Law 46/90	(05/03/1990) Regulations for safety of systems
Law 447/95	(26/10/1995) Outline law on acoustic pollution
Law 615/66	(13/07/1966) Measures against atmospherical pollution
D.L. 242	(19/03/1996) Modification and integration to D.L. 626/94
D.L. 494	(14/08/96) Implementation of EEC directive 92/57 concerning minimum safety and health requirements to be accomplished in temporary or mobile work sites
D.L. 626	(19/09/1994) Implementation of EEC directive concerning improvement of safety and health of workers in the working place
D.M. 10/03/98	General rules for fire protection safety and for emergency administration in the working place
DPR 303	(19/03/1956) General regulations for work hygiene
DPR 447	(06/12/1991) Regulation of accomplishment of Law 46/90 concerning safety of systems
DPR 459	(24/07/1996) Directive for equipments
DPR 547	27/04/1955) Regulations for work accident prevention
DPR 551	(21/12/1999) Regulation containing modification to DPR 412/93 concerning design, installation, use, and maintenance of thermal systems in the buildings, to contain energy consumption

ITALIAN NATIONAL ASSOCIATION FOR UNIFICATION OF STANDARDS (UNI)

NOTE: A UNI Norm is a technical normative recognized as Italian Law, submitted by a private

organization "Ente Nazionale Italiano di Unificazione" for Italy and is available only in the Italian language. It is the National Standard.

UNI 5634 (1997) Identification systems for pipelines and canalizations conveying fluids

ITALIAN/EUROPEAN HARMONIZATION STANDARDS (UNI EN)(UNI ENV)(CEI EN)
(UNI EN ISO)(UNI ISO)

NOTE: A UNI EN, UNI ENV, CEI EN, UNI EN ISO or UNI ISO is a European Standard with a coincident Italian National Standard or International Standard. The two standards are identical, with most (but not all) EN's available in the English language and the UNI available only in the Italian language.

UNI EN 438-1 (1993) Decorative high-pressure laminates (HPL) - Sheets based on thermosetting resins - Part 1: Specifications

UNI ISO 9227 (1993) Corrosion tests in artificial atmospheres - Salt spray tests

CEI EN 60034-1 (1996) Rotating Electrical Machines - Part 1: Rating and Performance

1.2 RELATED REQUIREMENTS

This section applies to all sections of Division 15, "Mechanical" of this project specification, unless specified otherwise in the individual section.

1.3 QUALITY ASSURANCE

1.3.1 Material and Equipment Qualifications

Provide materials and equipment that are standard products of manufacturers regularly engaged in the manufacture of such products, which are of a similar material, design and workmanship. Standard products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2 year use shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2 year period.

1.3.2 Alternative Qualifications

Products having less than a two-year field service record will be acceptable if a certified record of satisfactory field operation for not

less than 6000 hours, exclusive of the manufacturer's factory or laboratory tests, can be shown.

1.3.3 Service Support

The equipment items shall be supported by service organizations. Submit a certified list of qualified permanent service organizations for support of the equipment which includes their addresses and qualifications. These service organizations shall be "reasonably convenient" to the equipment installation and able to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract. "Reasonably convenient" in this context is defined as being able to provide a service technician to the site to correct deficiency within 48 hours of call.

1.3.4 Manufacturer's Nameplate

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.3.5 Applicable References

All sections of Division 15, "Mechanical" shall be governed by applicable Italian laws and norms including, but not limited to, Law 46/90, Law 447/95, Law 615/66, D.L. 242, D.L. 494, D.L. 626, D.M. 10/03/98, DPR 303, DPR 447, DPR 459, DPR 547, and DPR 551.

1.3.6 Modification of References

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction", or words of similar meaning, to mean the Contracting Officer.

1.3.6.1 Definitions

For the International Code Council (ICC) Codes referenced in the contract documents, advisory provisions shall be considered mandatory, the word "should" shall be interpreted as "shall." Reference to the "code official" shall be interpreted to mean the "Contracting Officer." For Navy owned property, references to the "owner" shall be interpreted to mean the "Contracting Officer." For leased facilities, references to the "owner" shall be interpreted to mean the "lessor." References to the "permit holder" shall be interpreted to mean the "Contractor."

1.3.6.2 Administrative Interpretations

For ICC Codes referenced in the contract documents, the provisions of Chapter 1, "Administrator," do not apply. These administrative requirements are covered by the applicable Federal Acquisition Regulations (FAR) included in this contract and by the authority granted to the Officer

in Charge of Construction to administer the construction of this project. References in the ICC Codes to sections of Chapter 1, shall be applied appropriately by the Contracting Officer as authorized by his administrative cognizance and the FAR.

1.4 DELIVERY, STORAGE, AND HANDLING

Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Contracting Officer. Replace damaged or defective items.

[1.5 ELECTRICAL REQUIREMENTS

Furnish motors, controllers, disconnects and contactors with their respective pieces of equipment. Motors, controllers, disconnects and contactors shall conform to and have electrical connections provided under Section 16402, "Interior Distribution System." Furnish internal wiring for components of packaged equipment as an integral part of the equipment. Extended voltage range motors will not be permitted. Controllers and contactors shall have a maximum of 120 volt control circuits, and shall have auxiliary contacts for use with the controls furnished. When motors and equipment furnished are larger than sizes indicated, the cost of additional electrical service and related work shall be included under the section that specified that motor or equipment. Power wiring and conduit for field installed equipment shall be provided under and conform to the requirements of Section 16402, "Interior Distribution System."

]1.6 INSTRUCTION TO GOVERNMENT PERSONNEL

When specified in other sections, furnish the services of competent instructors to give full instruction to the designated Government personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the specified equipment or system. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work.

Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section. When more than 4 man-days of instruction are specified, use approximately half of the time for classroom instruction. Use other time for instruction with the equipment or system.

When significant changes or modifications in the equipment or system are made under the terms of the contract, provide additional instruction to acquaint the operating personnel with the changes or modifications.

1.7 ACCESSIBILITY

NOTE: The following requirement is intended to solicit the installer's help in the prudent location

of equipment when he has some control over locations. However, designer's should not rely on it at all since enforcing this requirement in the field would be difficult. Therefore, the system designer needs to layout and indicate the locations of equipment, control devices, and access doors so that most of the accessibility questions are resolved inexpensively during design.

Install all work so that parts requiring periodic inspection, operation, maintenance, and repair are readily accessible. Install concealed valves, expansion joints, controls, dampers, and equipment requiring access, in locations freely accessible through access doors.

PART 2 PRODUCTS

2.1 BURIED WARNING AND IDENTIFICATION TAPE

UNI 5634. Shall be polyethylene plastic tape manufactured specifically for warning and identification of buried utility lines. Tape shall be provided in rolls, 80 mm minimum width, color coded for intended service with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be "CAUTION BURIED (GAS, ELECTRIC, etc.) LINE BELOW". Code and letter coloring shall be permanent, unaffected by moisture and other substances contained in trench backfill material. Where such a tape with suitable identification markings is identified as a "long lead" procurement item, a suitable substitute available locally and approved by the Contracting Officer may be substituted, and shall be used for all underground utilities. Buried warning material shall be placed at a minimum depth of 400 mm below finished grade.

2.2 TRACER WIRE FOR NONMETALLIC PIPING

Provide bare copper wire or aluminum wire not less than 3 mm in diameter and provide in sufficient length to be continuous over each separate run of nonmetallic piping. Attach wire to top of pipe to prevent displacement during construction operations.

2.3 IDENTIFICATION FOR ABOVEGROUND PIPING

Labels for pipes with 19 mm outside diameter and larger shall bear printed legends to identify contents of pipes and arrows to show direction of flow. Labels shall have color coded backgrounds to signify levels of hazard.

2.4 IDENTIFYING DEVICES AND LABELS

2.4.1 General

Manufacturer's standard products of categories and types required for each application as referenced in other Division 15 Sections. If more than one type is specified for application, selection is Installer's option, but provide one selection for each product category.

2.4.2 Equipment Nameplates

Metal nameplate with operational data engraved or stamped; permanently fastened to equipment.

- a. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data.
- b. Location: Accessible and visible location.

2.4.3 Stencils

Standard stencils, prepared for required applications with letter sizes complying with recommendations of UNI 5634 for piping and similar applications, but not less than 30 mm high letters for ductwork and not less than 19 mm high letters for access door signs and similar operational instructions.

- a. Material: Fiberboard or brass.
- b. Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for piping systems, comply with UNI 5634 for colors.

2.4.4 Pressure-Sensitive Pipe Markers

Manufacturer's standard preprinted, permanent adhesive, color-coded, pressure-sensitive vinyl, complying with UNI 5634.

2.4.5 Engraved Plastic-Laminate Signs

Engraved Plastic Laminate Signs: UNI EN 438-1, cellulose, paper-base, phenolic resin laminate engraving stock; black surface, black phenolic core, with white melamine sub core, unless otherwise indicated.

- a. Fabricate in sizes required for message.
- b. Engraved with engraver's standard letter style, of sizes and with wording to match equipment identification.
- c. Punch for mechanical fastening.
- d. Thickness: 1.6 mm, for units up to 130 sq. cm or 200 mm long; 3.2 mm for larger units.
- e. Fasteners: Self-tapping stainless-steel screws or contact-type permanent adhesive.

2.4.6 Plastic Equipment Markers

Color-coded, laminated plastic. Comply with the following color code:

- a. Green: Cooling equipment and components.
- b. Yellow: Heating equipment and components.
- c. Yellow/Green: Combination cooling and heating equipment and components.
- d. Brown: Energy reclamation equipment and components.
- e. Blue: Equipment and components that do not meet any criteria above.
- f. For hazardous equipment, use colors and designs recommended by UNI 5634.
- g. Nomenclature: Include the following, matching terminology on schedules as closely as possible:
 - 1. Name and plan number.
 - 2. Equipment service.
 - 3. Design capacity.
 - 4. Other design parameters such as pressure drop, entering and leaving conditions, and rpm.
- h. Size: Approximate 65 by 100 mm for control devices, dampers, and valves; and 115 by 150 mm for equipment.

2.4.7 Lettering and Graphics

Coordinate names, abbreviations, and other designations used in mechanical identification, with corresponding designations indicated. Use numbers, lettering, and wording indicated for proper identification and operation/maintenance of mechanical systems and equipment.

2.4.7.1 Multiple Systems

If multiple systems of same generic name are indicated, provide identification that indicates individual system number and service such as "Boiler No. 3," "Air Supply No. 1H," or "Standpipe F12."

2.5 HIGH EFFICIENCY MOTORS

2.5.1 High Efficiency Single-Phase Motors

Unless otherwise specified, single-phase fractional-horsepower alternating-current motors shall be high efficiency type corresponding the applications listed in CEI EN 60034-1.

2.5.2 High Efficiency Polyphase Motors

Unless otherwise specified, polyphase motors shall be selected based on high efficiency characteristics relative to the applications as listed in

CEI EN 60034-1. Additionally, polyphase squirrel-cage medium induction motors with continuous ratings shall meet or exceed energy efficient ratings in accordance with CEI requirements.

2.6 PIPE WALL THICKNESS TABLE

Table 2 Steel Pipe Data

Nominal Pipe Size mm	Pipe Schedule Number	Wall Thickness mm	Inside Diameter mm
20	40	2.87	20.9
20	80	3.91	18.8
25	40	3.38	26.6
25	80	4.55	24.3
32	40	3.56	35.0
32	80	4.85	32.5
40	40	3.68	40.9
40	80	5.08	38.1
50	40	3.91	52.5
50	80	5.54	49.2
65	40	5.16	62.7
65	80	7.01	59.0
80	40	5.49	78.9
80	80	7.62	73.7
100	40	6.02	102.3
100	80	8.56	97.2
150	40	7.11	154.0
150	80	10.97	146.3
200	30	7.04	205.0
200	40	8.18	202.7
200	80	12.70	193.7
250	30	7.80	257.4
250	40	9.27	254.5
250	EXTRA STRONG	12.70	247.6
250	80	15.06	242.9
300	30	8.38	307.1
300	STANDARD	9.53	304.8
300	40	10.31	303.2
300	EXTRA STRONG	12.70	298.4
300	80	17.45	288.9
350	30	9.53	336.5
350	40	11.10	333.4
350	EXTRA STRONG	12.70	330.2
350	80	19.05	317.5
400	30	9.53	387.3
400	40	12.70	381.0
450	STANDARD	9.53	438.1
450	30	11.10	435.0
450	EXTRA STRONG	12.70	431.8
450	40	14.27	428.6
500	STANDARD	9.53	488.9
500	30	12.70	482.6
500	40	15.06	477.9

Table 2 Steel Pipe Data

Nominal Pipe Size mm	Pipe Schedule Number	Wall Thickness mm	Inside Diameter mm
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Table 3 Copper Tube Data

Nominal Pipe Size mm	Type	Wall Thickness mm	Outside Diameter mm
8	K	0.89	9.53
8	L	0.76	9.53
10	K	1.24	12.70
10	L	0.89	12.70
10	M	0.64	12.70
15	K	1.24	15.88
15	L	1.02	15.88
15	M	0.71	15.88
19	K	1.24	19.05
19	L	1.07	19.05
20	K	1.65	22.23
20	L	1.14	22.23
20	M	0.81	22.23
25	K	1.65	28.58
25	L	1.27	28.58
25	M	0.89	28.58
32	K	1.65	34.93
32	L	1.40	34.93
32	M	1.07	34.93
32	DWV	1.02	34.93
40	K	1.83	41.28
40	L	1.52	41.28
40	M	1.24	41.28
40	DWV	1.07	41.28
50	K	2.11	53.98
50	L	1.78	53.98
50	M	1.47	53.98
50	DWV	1.07	53.98
65	K	2.41	66.68
65	L	2.03	66.68
65	M	1.65	66.68
80	K	2.77	79.38
80	L	2.29	79.38
80	M	1.83	79.38
80	DWV	1.14	79.38
90	K	3.05	92.08
90	L	2.54	92.08
90	M	2.11	92.08
100	K	3.40	104.78
100	L	2.79	104.78
100	M	2.41	104.78
100	DWV	1.47	104.78

3.1 PAINTING OF NEW EQUIPMENT

New equipment painting shall be factory applied or shop applied, and shall be as specified herein, and provided under each individual section.

3.1.1 Factory Painting Systems

Manufacturer's standard factory painting systems may be provided subject to certification that the factory painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt-spray fog test. Salt-spray fog test shall be in accordance with UNI ISO 9227, and for that test the acceptance criteria shall be as follows: immediately after completion of the test, the paint shall show no signs of blistering, wrinkling, or cracking, and no loss of adhesion; and the specimen shall show no signs of rust creepage beyond 3 mm on either side of the scratch mark.

The film thickness of the factory painting system applied on the equipment shall not be less than the film thickness used on the test specimen. If manufacturer's standard factory painting system is being proposed for use on surfaces subject to temperatures above 50 degrees C, the factory painting system shall be designed for the temperature service.

3.1.2 Shop Painting Systems for Metal Surfaces

Clean, pretreat, prime and paint metal surfaces; except aluminum surfaces need not be painted. Apply coatings to clean dry surfaces. Clean the surfaces to remove dust, dirt, rust, oil and grease by wire brushing and solvent degreasing prior to application of paint, except metal surfaces subject to temperatures in excess of 50 degrees C shall be cleaned to bare metal.

Where more than one coat of paint is specified, apply the second coat after the preceding coat is thoroughly dry. Lightly sand damaged painting and retouch before applying the succeeding coat. Color of finish coat shall be aluminum or light gray.

- a. Temperatures Less Than 50 Degrees C: Immediately after cleaning, the metal surfaces subject to temperatures less than 50 degrees C shall receive one coat of pretreatment primer applied to a minimum dry film thickness of 0.0076 mm, one coat of primer applied to a minimum dry film thickness of 0.0255 mm; and two coats of enamel applied to a minimum dry film thickness of 0.0255 mm per coat.
- b. Temperatures Between 50 and 205 Degrees C: Metal surfaces subject to temperatures between 50 and 205 degrees C shall receive two coats of 205 degrees C heat-resisting enamel applied to a total minimum thickness of 0.05 mm.
- c. Temperatures Greater Than 205 Degrees C: Metal surfaces subject to temperatures greater than 205 degrees C shall receive two coats of 315 degrees C heat-resisting paint applied to a total minimum dry film thickness of 0.05 mm.

3.2 FIELD PAINTING

Field painting of equipment is not permitted except for touch-up painting.

3.3 LABELING AND IDENTIFYING

3.3.1 Piping Systems

Install pipe markers on each system. Include arrows showing normal direction of flow.

3.3.1.1 Stenciled Markers

According to UNI 5634. Plastic markers, with application systems. Install on insulation segment if required for hot, uninsulated piping. Locate pipe markers as follows if piping is exposed in finished spaces, machine rooms, and accessible maintenance spaces, such as shafts, tunnels, plenums, and exterior non-concealed locations:

- a. Near each valve and control device.
- b. Near each branch, excluding short takeoffs for fixtures and terminal units. Mark each pipe at branch, if flow pattern is not obvious.
- c. Near locations if pipes pass through walls, floors, ceilings, or enter non-accessible enclosures.
- d. At access doors, manholes, and similar access points that permit view of concealed piping.
- e. Near major equipment items and other points of origination and termination.
- f. Spaced at maximum of 15 m intervals along each run. Reduce intervals to 7.5 m in congested areas of piping and equipment.
- g. On piping above removable acoustical ceilings, except omit intermediately spaced markers.

3.3.2 Equipment

Install engraved plastic laminate sign or equipment marker on or near each major item of mechanical equipment.

3.3.2.1 Lettering Size

Minimum 6.4 mm high lettering for name of unit if viewing distance is less than 610 mm, 12.7 mm high lettering for distances up to 1800 mm, and proportionately larger lettering for greater distances. Provide secondary lettering 2/3 to 3/4 of size of principal lettering.

3.3.2.2 Text of Signs

Provide name of identified unit. Include text to distinguish between multiple units, inform user of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.3.3 Adjusting

Relocate identifying devices as necessary for unobstructed view in finished construction.

-- End of Section --