

MIL-T-24388/5 (6H)
26 April 1979

MILITARY SPECIFICATION

THERMOCOUPLE AND RESISTANCE TEMPERATURE ELEMENT ASSEMBLIES.

TYPE TCE (BY INSTALLATION)

This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 This specification covers the requirements for thermocouple temperature elements, type K, designed for bayonet mounting.

2. APPLICABLE DOCUMENTS

2.1 Issues of documents. The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

SPECIFICATIONS

MILITARY

- MIL-W-24270 - Wells for Indicators or Thermal Elements, General Specification.
- MIL-W-24270/19 - Well (For Temperature Indicators or Thermal Elements); Insertion Length - 2 Inches, Bore - 1/4 Inch, Connection - Socket Weld or Socket Brazed, 3/4 Inch IPS.
- MIL-W-24270/20 - Well (For Temperature Indicators or Thermal Elements); Insertion Length - 2 Inches, Bore - 1/4 Inch, Connection - Butt Weld or Butt Brazed.
- MIL-W-24270/21 - Well (For Temperature Indicators or Thermal Elements); Insertion Length - 2 Inches, Bore - 1/4 Inch, Connection - "O" Ring Seal 1-5/16 - 12UA-2A.
- MIL-W-24270/24 - Well (For Temperature Indicators or Thermal Elements); Insertion Lengths - 3-1/2 Inches, Bore - 1/4 Inch, Connection - Butt Weld.
- MIL-T-24388 - Thermocouples and Resistance Temperature Element Assemblies, General Specification For (Naval Shipboard).

STANDARDS

MILITARY

- MIL-STD-108 - Definitions and Basic Requirements for Enclosures for Electric and Electronic Equipment.

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Assemblies shall conform to the requirements of MIL-T-24388 except as specified herein.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Ship Engineering Center, SEC 6124, Department of the Navy, Washington, DC 20362 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MIL-T-24388/5 (SH)

3.2 Description. Assemblies shall be designed for insertion into a thermowell which has been fabricated to conform to MIL-W-24270. Assemblies shall consist of the following parts (see figure 1):

- (a) Sheathed sensing element.
- (b) Spring to maintain sheath in contact with the bottom of a well.
- (c) Bayonet adapter.

3.3 Leads. Wires emerging from the sheath shall be 18 to 22 American Wire Gage (AWG). Insulation of individual connection leads shall be tetrafluoroethylene (teflon, TFE) or glass braid (as required to meet temperature requirements) (see table I). Connection leads shall have an outer jacket of braided stainless steel over glass braid.

3.4 Spring loading. Thermocouple temperature element shall be spring loaded similar to that shown on figure 1. Spring material shall be suitable for the temperature range (see table I). Minimum spring compression shall be 3/16 inch. A minimum force of 5 pounds shall be exerted by the spring each time under compression (see 4.8.6 of MIL-T-24388).

TABLE I. Application.

Type	Designation number	Size (see figure 1) (inches)		Temperature range (°F)	Maximum connection temperature (°F)	Thermowell MIL-W-24270 specification sheet no.	Insertion length (inches)
		L	A				
TCE	4	4- 7/16	1-3/4	-40 to 200			
	6	6-11/16	4	-40 to 400	300	19, 20, 21	1-7/8
	9	9-11/16	7	-40 to 700	500	24	3-3/8

3.5 Enclosure. Assembly shall be watertight as defined in MIL-STD-108.

3.6 Sheath diameter. Sheath diameter shall be 0.250 plus or minus 0.005 inch.

3.7 Performance. General assembly performance shall be as specified in MIL-T-24388 and as specified herein.

3.7.1 Response time. Response time of the assembly shall be 8 seconds or less when tested in accordance with MIL-T-24388.

4. QUALITY ASSURANCE PROVISIONS

4.1 Quality assurance provisions shall be in accordance with MIL-T-24388 except as specified herein.

4.2 Qualification inspection. Qualification inspection shall be as specified in MIL-T-24388 and table II herein.

TABLE II. Qualification inspection.

Examination and tests	Requirement paragraph (MIL-T-24388)	Inspection paragraph (MIL-T-24388)
General examination	3.5	4.6
Calibration	3.9.2.1	4.9.2.1
Response time	3.7.1 herein	4.8.1
Thermal cycling	3.8.2	4.8.2
Hermetic seal	3.7.6	4.8.4
Salt spray	3.8.1	4.8.5
Insulation resistance	3.8.8	4.8.9
Vibration	3.8.5	4.8.7
Shock	3.8.6	4.8.8
Terminal strength	3.8.3	4.8.10
Spring loading	3.4 herein	4.8.6
Enclosure	3.5 herein	4.8.3

5. PREPARATION FOR DELIVERY

5.1 Preservation-packaging, packing, and marking shall be in accordance with MIL-T-24388.

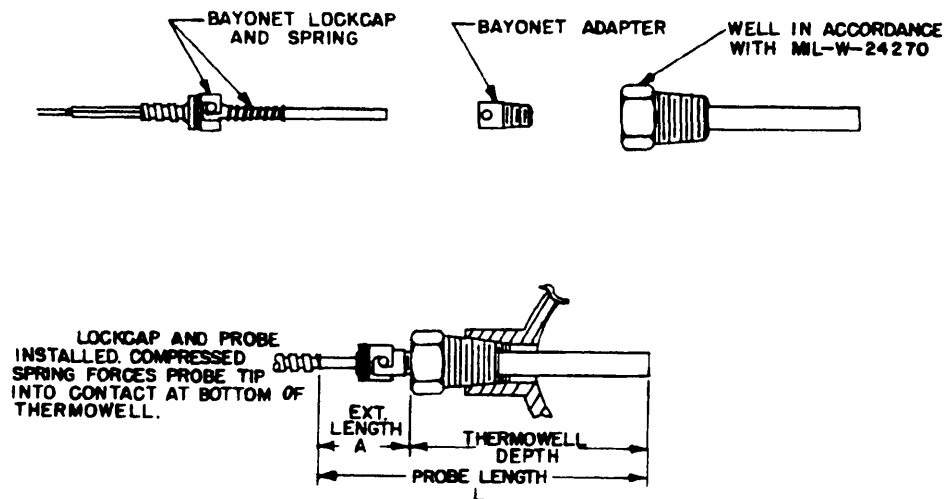
MIL-T-24388/5(SH)

6. NOTES

6.1 Notes shall be in accordance with MIL-T-24388.

Preparing activity:
Navy-SH
(Project 6685-N607-5)

MIL-T-24388/5 (SH)



SH 10450

FIGURE 1. Thermocouple temperature sensor assembly with well without connection head.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS: This form is provided to solicit beneficial comments which may improve this document and enhance its use. DoD contractors, government activities, manufacturers, vendors, or other prospective users of the document are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity. A response will be provided to the submitter, when name and address is provided, within 30 days indicating that the 1426 was received and when any appropriate action on it will be completed.

NOTE: This form shall not be used to submit requests for waivers, deviations or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

DOCUMENT IDENTIFIER (Number) AND TITLE

MIL-T-24388/5

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

☐ VENDOR ☐ USER ☐ MANUFACTURER

1. ☐ HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? ☐ IS ANY PART OF IT TOO RIGID, RESTRICTIVE, LOOSE OR AMBIGUOUS? PLEASE EXPLAIN BELOW.

A. GIVE PARAGRAPH NUMBER AND WORDING

B. RECOMMENDED WORDING CHANGE

C. REASON FOR RECOMMENDED CHANGE(S)

2. REMARKS

SUBMITTED BY (Printed or typed name and address — Optional)

TELEPHONE NO.

DATE

DD FORM 1426
1 OCT 76

EDITION OF 1 JAN 72 WILL BE USED UNTIL EXHAUSTED.

FOLD

COMMANDER
NAVAL SHIP ENGINEERING CENTER (SEC 6124)
DEPARTMENT OF THE NAVY
WASHINGTON, D.C. 20362

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

POSTAGE AND FEES PAID

DEPARTMENT OF THE NAVY

DOD 316



COMMANDER
NAVAL SHIP ENGINEERING CENTER (SEC 6124)
DEPARTMENT OF THE NAVY
WASHINGTON, D.C. 20362

FOLD