GENERAL HEADQUARTERS
ARMED FORCES OF THE PHILIPPINES
OFFICE OF THE QUARTERMASTER GENERAL
Camp General Emilio Aguinaldo, Quezon City

AFP SPECIFICATION **QM SPEC NR JE-22COD**
OCT 01 2016

COMPASS, OLIVE DRAB (OD)

1. GENERAL

1.1 Scope – This specification covers an induction-damped, unmounted magnetic compass with 5 degree and 20 mil graduations for individual use during day and night time of military personnel of the Armed Forces of the Philippines.

1.2 Grade – The finished compass shall conform to the quality and grade of product prescribed by this specification.

1.3 Size – The finished Compass shall be of one (1) size only, the dimensions of which shall be as shown in the attached illustrations.

2. REQUIREMENTS

2.1 First Article – Two (2) samples of the finished compass shall be submitted to the Office of the Quartermaster General, AFP or equivalent office in the major services and shall be subjected to first article inspection in accordance with para 3.1.

2.2 Materials

2.2.1 Basic Materials – The compass shall be fabricated from aluminum cast or fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration to which they are susceptible, Olive Drab in color.

2.3 Operating requirements

2.3.1 Graduations – The compass shall be graduated in degrees and mils. The degree graduations shall be semi-gloss red and identified at 5 degree intervals. They shall be numbered every 20 degrees, with north being 0 degrees. The north arrow may be used in lieu of the "0" degree marking. The mil graduations shall be semi-gloss black and identified at 20 mil intervals. They shall be numbered every 200 mils, using only hundreds and thousands digits (i.e., 2, 4, 6 ...64 represent 200, 400, 600, 6400 mils). North shall be identified as 6400 mils. All graduations shall be distinguishable in day and night conditions.

2.3.2 Scale – The compass shall have a scale of 1:50000 with graduations of 100 meters, 0 to 6000 minimum, along the length of the compass, in the opened configuration.

2.3.3 Sighting device – The compass shall have a magnifying sighting optics, capable of aiming the compass in day and night conditions.

2.3.4 Bezel – The compass shall have an attached bezel (ring with luminous line), capable of rotation through 360 degrees in either direction. Rotation shall be limited to 3 degree increment with tactile (non-audible) feedback. There shall also be means to prevent accidental movement or removal of the bezel.

2.3.5 Free Floating Assembly – When a free floating assembly is employed, the compass shall incorporate a mechanism that restricts all movement of the dial assembly when the compass is not in use, and automatically releases the dial assembly for use.

2.3.6 Lanyard – A neck lanyard 2.0 mm (minimum) thick with the ends permanently joined to form a loop, 150 ± 5 cm in circumference shall be attached to each compass. The lanyard shall be olive drab and made from braided polyester, nylon or olefin.

2.3.6.1 Lanyard Attachment - The lanyard and compass attachment point shall withstand a minimum force of 30 kg without damage, breakage or separation from the compass.

2.3.7 Carrying Case – A carrying case shall be furnished with each compass. The case shall be a pouch made from polyester or nylon with a single heavy duty fastening system on the fold over flap closure. The carrying case material shall be olive drab and the fasteners shall be black. It shall be provided with a drainage hole and for attachment to belts 7 ± 1 cm wide.

2.3.7.1 Instruction Card – Instructions in semi-gloss white lettering shall be printed on a semi-gloss green card, 7 ± 1 x 10 ± 1 cm and shall not be easily damaged by water or moisture. One card, without being folded, shall be inserted into each compass carrying case. Data, printed legibly on cards, shall be as follows:

INSTRUCTIONS:

(1) Align luminous line on compass ring with sight lines.

(2) Turn ring counterclockwise by desired number of clicks.
Note: Number of clicks = degrees azimuth divided by 3
Example: 51 degrees azimuth / 3 = 17 clicks counterclockwise.

(3) Turn compass until north arrow lines up with luminous line on ring.

(4) Sight line now points to azimuth.

2.3.8 Magnetic Performance – The compass shall provide magnetic performance, when operated. It shall be capable of being read to an accuracy that ensures an error not greater than 40 mils, in any ambient light, under adverse field conditions.

2.3.9 Mechanical Performance – The compass shall meet the subordinate requirements with the compass in the operational configuration and away from all magnetic effects external to the compass caused by buildings, vehicles and electrical devices.

2.3.9.1 Damping – The magnetic assembly shall come to rest within 6 seconds of time after being deflected 540 ± 20 mils from a position of equilibrium.

2.3.9.2 Freedom of rotation when tilted – The operation of the compass shall not be adversely affected when it is tilted 8.0 ± 0.1 degree from the horizontal and rotated 360 degrees in a plane normal to the longitudinal axis of the pivot.

2.3.9.3 Compass error – The error in magnetic azimuth, including that caused by pivot friction, shall not be greater than 40 mils.

2.3.9.4 Friction error – The error caused by friction between the pivot supporting the dial and its bearing shall not be greater than 20 mils.

2.3.10 Illumination – The compass shall have internal, self-exciting light sources of constant luminosity for sighting and reading. In addition, the dial assembly shall have a light source on the permanent magnet to indicate north and the bezel crystal shall have a light source to aid in setting readings and sighting. The "E" (east) and "W" (west) markings shall also be illuminated. All sources shall be mounted flush with or recessed in their mounting surfaces and encapsulated to inhibit damage.

2.4 Environmental requirements

2.4.1 Water Leakage – The complete compass shall be capable of being submerged into water without leakage into the interior of the compass, where it will adversely affect performance directly or indirectly.

2.4.2 Shock – The compass shall not be damaged or suffer performance degradation when dropped from a height of 90 cm.

2.4.3 Low and high temperature – When exposed to a temperature extremes of -10° ± 3°C and 66° ± 3°F the compass shall function properly and shall not be damaged.

2.5 Support requirements

2.5.1 Dimension and Weight – The compass shall be 7.6 ± 0.3 cm long, 5.7 ± 0.3 cm wide and 4 cm high (maximum), in its closed or stored configuration. Its weight shall be 200 grams (maximum).

2.6. Workmanship

2.6.1 Design – The design of the compass shall be as illustrated in Figure 1A & 1B. The materials and manufacturing processes are the prerogative of the contractor as long as they meet the operating, environmental, and support requirements specified.

2.6.2 Finish – The compass shall be free from any visual defect such as dents, corrosion and deep scratches which may affect the serviceability, appearance and color of the finished item.

3. VERIFICATION

3.1. First Article Inspection - The samples of the finished compass submitted in para 2.1 shall be subjected to first article inspection and for approval as against the bid sample. The sample shall be subjected to test and examination to verify if the requirements in para 2.2 through 2.6 are satisfied with reference to the attached test parameters and classification of defects for this document.

4. QUALITY ASSURANCE PROVISION

4.1 Responsibility of Inspection – Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the government. The government reserves the right to perform any of the inspections set forth in the specifications which are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Responsibility for Compliance – All items must meet all the requirements of sections 2 & 3. The inspections set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the government for acceptance comply with all the requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material either indicated or actual, nor does it commit the government of defective material.

4.3 Bid Samples – Two (2) bid samples of the finished compass shall be submitted to RDC, ASCOM, PA to determine the extent of compliance with the specification insofar as quality of materials used is concerned. The Office of Quartermaster General, AFP or equivalent office in the major services shall determine the extent of compliance with the specification insofar as workmanship, style and finish are concerned.

5. PACKAGING AND PACKING

5.1 Packaging – The compass shall be folded uniformly and the exposed metal parts shall be wrapped with appropriate packaging material to avoid the metal parts from being scratch in handling. Each compass shall be packed in its individual pouches.

5.2 Packing – Twenty five (25) pieces of compass shall be placed in a transparent cellophane/plastic bag and packed in a corrugated carton. The top cover when closed shall be sealed with a binding tape and the box shall be labeled as follows:

COMPASS, OLIVE DRAB (OD)
QM SPEC NR IE-22COD
Name of Contractor:
QTY: 25 pcs

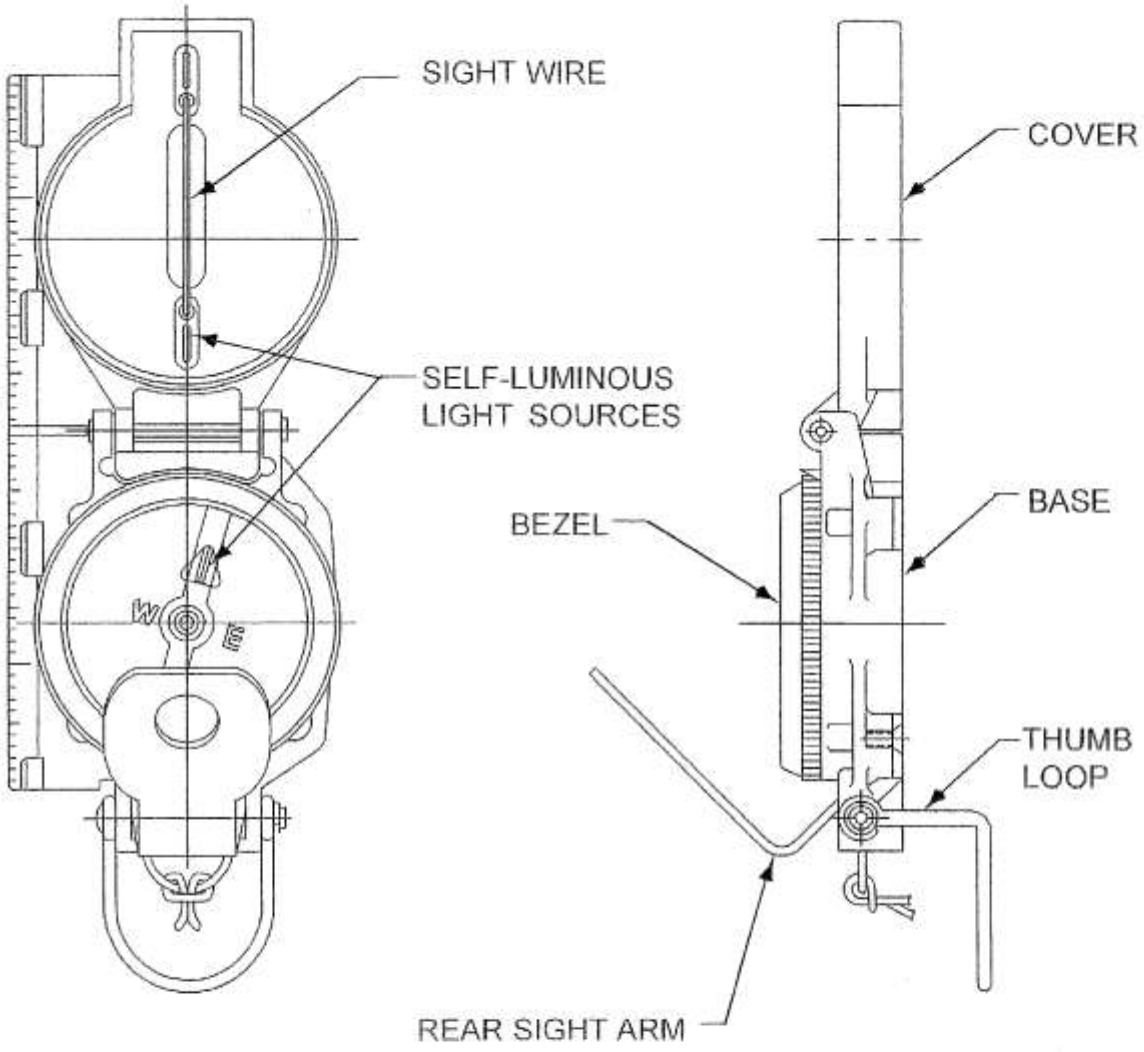
6. MISCELLANEOUS

6.1 The contractor/manufacturer shall notify the Office of The Quartermaster General, AFP at least seven (7) days before actual production starts so that AFP inspectors can be assigned to oversee the process of manufacture to be followed and to inspect the quality of materials to be used.

6.2 Any point not covered by this text shall be governed by the attached illustrations which shall be followed in every detail.

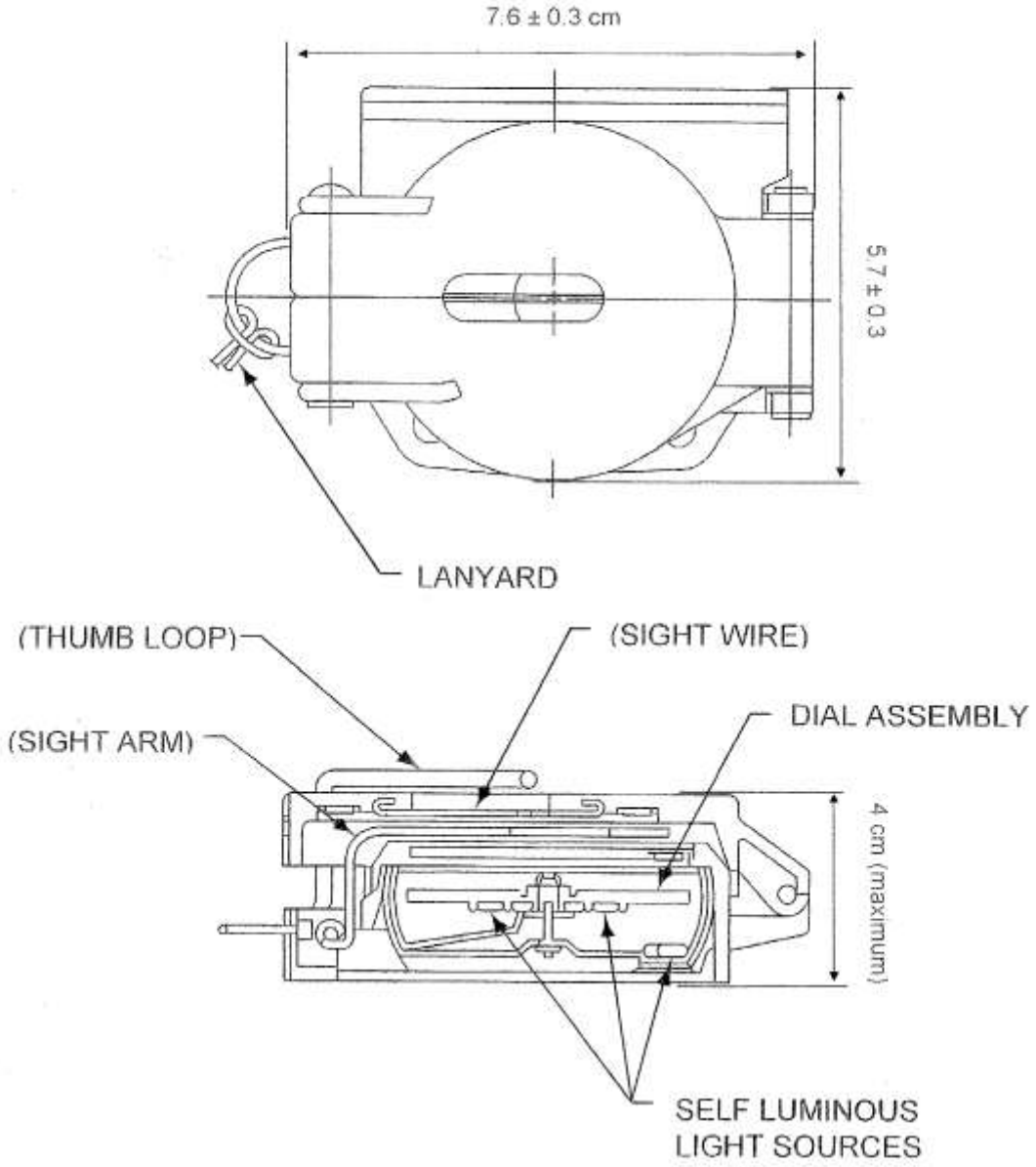
RAFAEL A SERA JOSE
BGEN AFP
The Quartermaster General, AFP

NOTED
CSAFP
DATE : 01 OCT 2016



COMPASS - OPEN

FIGURE 1A



COMPASS - CLOSED

FIGURE 1B

Test and Examination Procedure

I. Operating requirements

a. Graduations – The compass graduations shall be visually examined to verify that the degrees are in semi-gloss red with 5-degree intervals, the mil graduations are in semi-gloss black with 20-mil intervals, and graduations are distinguishable in day and night conditions. Any deviation constitutes failure of this requirement.

b. Scale – The compass scale shall be visually examined to verify that it has a 1:50000 scale with 100 meters graduations, 0 to 6000 minimum, along the length of the compass, in the opened configuration (if applicable). Any deviation constitutes failure of this requirement.

c. Sighting Device – The compass shall be aimed at a target. Inability to aim the compass at the target utilizing sighting mechanism shall constitute failure of this requirement.

d. Bezel – The bezel shall be rotated 360 degrees in both directions. Failure of the bezel to rotate in either directions in three-degree increments with tactile (non-audible) feedback or to restrict accidental movement or to remain attached shall constitute failure of this requirement.

e. Free Floating Assembly – The compass shall be examined in an open and closed configuration. The restraining mechanism shall be tested by hand shaking the closed compass; rattling of the floating dial assembly shall constitute failure of this requirement. Then, the compass shall be opened to a reading position; failure of the restraining mechanism to release the dial assembly shall constitute failure of this requirement.

f. Lanyard – The neck lanyard shall be examined to verify that the thickness is 2.5 ± 0.5 mm and the ends are permanently joined to form a loop of 150 ± 5 centimeters in circumference, and that the material is a suitable, pliable, durable material of lusterless green. Failure of this examination constitutes failure of this requirement.

g. Lanyard Attachment –The assembled compass shall be fixed in an apparatus able to withstand the forces to be applied that will not hinder or support the attachment of the lanyard. A minimum tensile force of 34 kilograms shall be applied to the attached lanyard, at a point where the force is exerted on both the joint forming the loop and the point of attachment to the compass. Any damage or breakage of the lanyard or compass shall constitute failure of this test.

h. Carrying Case – The carrying case shall be examined to verify that the material is pliable and durable and the color is olive drab. In addition, verify that the case has a heavy-duty black fastening system on the flap, a means for drainage, and a 7 mm belt attachment. The compass shall be placed in the case and the case flap fastened and unfastened. Then the compass shall be removed from the case to verify ease of storage and removal. There shall be no snags or tightness within the case, which prevents the compass from slipping in and out easily. Failure of this examination constitutes failure of this requirement.

i. Instruction Card – The instruction card shall be examined to verify that the instructions are correct; the lettering is semi-gloss white (see 6.11); the card is semi-gloss green and 6 x 10 cm, nominal size; the card is water or moisture resistant; and that one unfolded card fits in the compass carrying case. Failure of this examination constitutes failure of this requirement.

j. Magnetic Performance and Compass Error – The compass shall be placed in a horizontal position on a fixed point and by means of the sighting mechanism, the compass shall be sighted on three targets of known magnetic azimuths approximately 120 degrees apart. With no remedial action by the operator, before, at, or after, a reading shall be taken at each target. The difference between the known azimuths and readings taken is the compass error. An error greater than 40 mils or failure of the compass to function correctly shall constitute failure of this test.

k. Mechanical Performance – The following tests shall be with the compass in the operational configuration and away from all magnetic effects external to the compass.

l. Damping – The compass magnet shall be deflected 540 ± 20 mils from a position of equilibrium and released. If the magnetic assembly requires more than 6 seconds to come to rest, it shall constitute failure of this test.

m. Freedom of rotation when tilted – The compass shall be tilted 8.0 ± 0.1 degree from the horizontal and uniformly rotated 360 degrees at approximately 10 seconds of time per revolution, in a plane normal to the longitudinal axis of the pivot. The compass shall be rotated one complete revolution in the clockwise direction and one complete revolution counter clockwise. Inability of the dial or magnetic assembly to remain free while being rotated shall constitute failure of this test.

n. Friction error – The compass dial assembly shall be magnetically deflected 40 ± 5 mils by an external force acting in the horizontal plane of the compass. The mechanism shall be permitted to come to rest. The external force shall then be removed in a radial direction in the same horizontal plane. The compass dial shall then be read. The procedure shall be repeated by deflecting the magnet 40 ± 5 mils in the opposite direction. One-half of the difference between the two readings is the friction error. An error greater than 20 mils shall constitute failure of this test.

o. Illumination – The compass shall be examined to verify that the unit has light sources for reading and sighting; the permanent magnet on the dial assembly and the bezel crystal have light sources to aid in setting readings and sighting; and, the "E" (east) and "W" (west) markings are illuminated. Also, verify that the light sources are self-exciting and that all sources are recessed or flush mounted and encapsulated. Failure of this examination constitutes failure of this requirement.

p. Luminosity – The assembled compass shall be examined visually for dead or dim luminous sources, after it has been dark adapted for not less than 1 hour. The spectral and luminescent output shall be visually compared to a compass used to establish the working standards. Sources of questionable luminosity shall be retested. All subsequent brightness tests shall be determined by a photoelectric photometry method,

corrected for photonic vision, using a photometer calibrated to the working standards. If the brightness of the luminous sources of the assembled compass is not sufficient to perform all compass functions in any ambient light and under any of the environmental conditions specified; herein, it shall constitute failure of this test.

II. Environmental requirements

a. Water Leakage – When radiological tests are performed, this test may be accomplished in conjunction with diffusion tests. The complete compass shall be submerged in 300 ml of distilled or deionized water for 3 hours at 23° ± 5°C. The compass shall be removed from the water and examined for water leakage. If there is evidence of water in the compass bowl at the completion of the test, it shall constitute failure of this test.

b. Shock – The compass, in the open configuration (if applicable), shall be dropped twice from a height of 90 cm onto a solid surface covered with 10 cm of 40 grit kiln dried sand. The sand may be covered with a sheet of plastic not greater than 2 mils thick. The compass shall hit the sand or plastic face up on one drop and edgewise on the second. Any evidence of damage (other than cosmetic) to the compass or failure to operate as specified herein shall constitute failure of this test.

c. Low and High Temperature – The completed compass shall be subjected to one complete cycle each of low and high temperature operation. The compass in its closed configuration (if applicable) shall be subjected to a temperature of -10° ± 3°C for a period of 30 minutes without the benefit of solar radiation. After this period and at this temperature, the compass shall be opened (if applicable) and examined. The compass shall then be closed (if applicable) and after stabilizing at room temperature, be subjected to a temperature of 66° ± 3°F for a period of 30 minutes. After this period and at this temperature, the compass shall be opened (if applicable) and examined. During either examination, any evidence of damage or failure of the compass dial to seek north and rotate smoothly and freely shall constitute failure of this test.

III. Support requirements

a. Dimension and Weight – The compass shall be measured and weighed. Dimensions greater than 9 cm long, 8 cm wide and 4 cm high, in its closed or stored configuration or weight greater than 170 grams shall constitute failure of this requirement.

GENERAL HEDQUARTERS
ARMED FORCES OF THE PHILIPPINES
OFFICE OF THE QUARTERMASTER GENERAL
Camp General Emilio Aguinaldo, Quezon City

TEST PARAMETERS

COMPASS, OLIVE DRAB (OD)

OCT 01 2016

TEST PARAMETERS	QM SPEC NR IE-22COD OCT 01 2016	CLASSIFICATION OF DEFECTS	
		Major	Minor
Materials	The compass shall be fabricated from aluminum cast or fabricated from compatible materials	x	
	Shall be corrosion-resistant or treated to provide protection against the various forms of corrosion and deterioration to which they are susceptible	x	
Color	Olive Drab	x	
Operating Requirements			
Graduations	Shall be graduated in degrees and mils and shall be distinguishable in day and night conditions	x	
	The degree graduations shall be semi-gloss red and identified at 5 degree intervals.	x	
	They shall be numbered every 20 degrees, with north being 0	x	
	The mil graduations shall be semi-gloss black and identified at 20 mil intervals	x	
	They shall be numbered every 200 mils, using only hundreds and thousands digits (i.e., 2,4,6 …64 represent 200, 400, 600, …6400) North shall be identified as 6400 mils.	x	
Scale	Shall have a scale of 1:50000 with graduations of 100 meters, 0 to 6000 minimum, along the length of the compass, in the opened configuration.	x	
Sighting device	Shall have magnifying sighting optic, capable of aiming the compass in day and night conditions.	x	
Bezel	Shall have an attached bezel (ring with luminous line), capable of rotation through 360 degrees in either direction	x	
Lanyard	Shall have a lanyard	x	
Material	Made from braided polyester, nylon or olefin		x
Color	Olive Drab	x	
Diameter, mm	2.0 (minimum)		x
Length, cm	150 ± 5		x
Lanyard Attachment	The lanyard and compass attachment point shall withstand a force of 34 kg without damage, breakage or separation from the compass.	x	
Carrying Case	Shall have a pouch made from polyester or nylon	x	
	Provided with a single heavy duty fastening system on the fold over flap closure.		x
	Shall be provided with a drainage hole and for attachment to belts 7 ± 1 cm wide.		x
Color	Olive Drab	x	

TEST PARAMETERS	QM SPEC NR IE-22COD	CLASSIFICATION OF DEFECTS	
		Major	Minor
Instruction Card	With instruction card	x	
Magnetic Performance	Shall provide magnetic performance and capable of being read to an accuracy that ensures an error not greater than 40 mils.	x	
Damping	The magnetic assembly shall come to rest within 6 seconds of time after being deflected, 540 mils ± 20 mils from a position of equilibrium.		x
Freedom of Rotation when tilted	The dial and magnet assembly shall be tilted 8.0 + 0.1 degree from the horizontal and rotated 360 degrees clockwise and counterclockwise and shall operate freely.		x
Compass Error	The error in magnetic azimuth, including that caused by pivot friction, shall not be greater than 40 mils.		x
Friction Error	The error caused by friction between the pivot supporting the dial and its bearing shall not be greater than 20 mils.		x
Illumination	Shall have internal, self-exciting sources of constant luminosity for sighting and reading.	x	
	The dial assembly shall have a light source on the permanent magnet to indicate north and the bezel crystal shall have a light source to aid in setting reading and sighting.	x	
	The "E" (east) AND "w" (west) marking shall also be illuminated	x	
Environmental Requirements			
Water Leakage	The complete compass shall be capable of being submerged into water without any evidence of leakage into the interior of the compass.	x	
Shock	The compass shall not be damaged or suffer performance degradation when dropped from a height of 90 cm	x	
Low and High Temperature	When exposed to temperature extremes of -10 ± 3°C and 66°C ± 3°F, the compass shall function properly and shall not be damaged.	x	
Supporting Requirements			
Length, cm	7.6 ± 0.3		x
Width, cm	5.7 ± 0.3		x
Height	4 (maximum)		x
Weight, gms	200 (maximum)		x
TOTAL TEST POINTS		**24**	**13**

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