

Royal Navy

Method of recording: Pulheems Equivalent (PE)

In Medical standards the Navy uses a form of shorthand, the Pulheems Equivalents, and in vision these are as follows:

Snellen Figures	6/6	6/9	6/12	6/18	6/24	6/36	6/60	< 6/60
PE	1	2	3	4	5	6	7	8

Right Eye	Left Eye
PE: Unaided	
PE: With Spectacles	

Thus unaided vision of 6/24, and corrected visual acuity of 6/6 would be recorded as PE: 5/1

Eyesight and colour perception standards

The following standards are applicable to all personnel on the Active and Reserve Lists of the Royal Navy, Royal Marines and QARNNS, who joined the service **before 1 January 1995**.

Visual acuity (VA)

There are three standards of visual acuity, graded as follows:

Standard 1				
Requirements	Better eye	PE	PE	Worse eye
Visual acuity to be achieved without correcting lenses	6/9 N5	2	3	6/12 N5
Refraction limit				
Total hypermetropia	+2.50 sphere			+3.50 sphere
Astigmatism	+0.75 cyl			+1.00 cyl
Myopia	-0.25 sphere or cyl			-0.75 sphere or cyl
Standard 1A				
Requirements	Better eye	PE	PE	Worse eye
Visual acuity to be achieved without correcting lenses	6/12 N5	3	3	6/12 N5
Visual acuity to be achieved with correcting lenses	6/6 N5	1	1	6/6 N5
Refraction limit (in any meridian)				
Total hypermetropia	+3.50 sphere			+3.50 sphere
Astigmatism	+1.00 cyl			+1.00 cyl
Myopia	-0.75 sphere or cyl			-0.75 sphere or cyl
Standard 2				
Requirements	Better eye	PE	PE	Worse eye
Visual acuity to be achieved with or without correcting lenses	Either 6/6 N5 or 6/9 N5 or 6/12 N5	8/1 8/2 8/3	8/5 8/4 8/3	6/24 N10 6/18 N10 6/12 N10
Refraction limit spectacle correction (in any meridian)	± 7.00 sphere or cyl			± 7.00 sphere or cyl

The following standards are applicable to all personnel on the Active and Reserve Lists of the Royal Navy, Royal Marines and QARNNS, who joined the service **on or after 1 January 1995**.

Visual acuity (VA)

There are four standards of visual acuity, graded as follows:

Standard I				
Requirements	Right eye	PE	PE	Left eye
Visual acuity to be achieved without correcting lenses	6/12 N5	3	3	6/12 N5
Visual acuity to be achieved with correcting lenses	6/6 N5	1	1	6/6 N5
Refraction limit (in any meridian)				
Total hypermetropia	+3.00 sphere			+3.00 sphere
Astigmatism	+1.25 cyl			+1.25 cyl
Myopia	-0.75 sphere or cyl			-0.75 sphere or cyl
Standard II Entry Standard				
Requirements	Right eye	PE	PE	Left eye
Visual acuity to be achieved without correcting lenses	6/24	5	6	6/36
Visual acuity to be achieved with correcting lenses	6/6 N5	5/1	6/2	6/9 N5
Refraction limit (in any meridian)	+3.00 sphere -2.50 sphere or cyl			+3.00 sphere -2.50 sphere or cyl
Standard II Serving Personnel (on the trained strength)				
Requirements	Right eye	PE	PE	Left eye
Visual acuity to be achieved without correcting lenses	6/60	7	8	<6/60
Visual acuity to be achieved with correcting lenses	6/6 N5	5/1	6/2	6/9 N5
Refraction limit (in any meridian)	±6.00 sphere or cyl			±6.00 sphere or cyl
Standard III				
Requirements	Right eye	PE	PE	Left eye
Visual acuity to be achieved without correcting lenses	6/60	7	8	<6/60
Visual acuity to be achieved with correcting lenses	Either 6/6 N5 or 6/9 N5 or 6/12 N5	7/1 7/2 7/3	8/5 8/4 8/3	6/24 N10 6/18 N10 6/12 N10
Refraction limit spectacle correction (in any meridian)	± 6.00 sphere or cyl			± 6.00 sphere or cyl

Standards required

Specialisation/Branch	Visual Acuity Standard		Colour Perception
	Before 1 Jan 1995	After 1 Jan 1995	
Officers			
Aircrew GL, SL, SD	1A	I	1
Other Seamen	1A	II	1
S&E officers in SSBNs & SSNs (max correction ± 3.00 D)	1A	II	1
SD(AV), ATC & FDO	2	III	3
RM Officers			
GL/SS	2	III	3
Pilots	1A	I	1
Bridge Watchkeepers	1A	II	1
All Other Officers	2	III	4
Ratings			
Operations Branch:-			
Seamen Group	2	NA	3
Missile Aimers	1	NA	3
Communications	2	NA	3
Tactical Sub Branch	2	NA	3
Operator Mechanic (OM)			
Above water (AW)	NA	I	3
Under water/ Electronic/ Tactical Submarine/ Communications Technician	NA	II	3
OM 2 nd class			
Mine/ Communications Submarine/ Communications	NA	II	3
Weapons Submarine	NA	II	4
FAA:-			
Aircrewmen	1A	I	1
Air Eng. Mechanics	2	III	2
Air Eng. Artificers	2	III	2
FAA other	2	III	3
Survey Recorders	1A	II	3
Sub Specializations:-			
Regulating	2	III	4
Diver			
Photo Interpreter	2	III	3
Other RN ratings		III	4
RM Other Ranks			
Aircrew	1A	I	1
Snipers	1A *	I *	3
Landing Craft	1A *	I *	3
Swimmer Canoeists	1A *	I *	3
All others	2	III	4

QARRNS	2	III	4

* Corrective lenses not permitted

Method of testing

1. Distance visual acuity is tested using Snellen charts viewed directly at a distance of 6 metres (20 feet) or in a properly adjusted mirror at 3 metres. Specifications, including general recommendations on lighting, are contained in British Standard 4274:1968.
2. Before being given an appointment for an initial medical examination, the recruit is to be questioned as to whether he or she wears glasses of contact lenses and the following procedure adopted.
 - a. Recruits who wear spectacles are to be instructed:
 - (1) to bring their spectacles with them when attending the medical examination;
 - (2) to bring a written spectacle prescription which can be obtained from any optician.
 - b. Recruits who wear contact lenses (hard or soft) and already have spectacles are:
 - (1) to be given an appointment at a date no earlier than that which will allow them not to wear contact lenses for two weeks before the medical examination.
 - (2) to bring their spectacles with them when attending the medical examination;
 - (3) to bring a written spectacle prescription which can be obtained from any optician.
 - c. Recruits who wear contact lenses but do not own spectacles are:
 - (1) to be given an appointment at a date no earlier than that which will allow not to wear contact lenses for two weeks prior to the examination, but to bring them to the examination, if their civilian appointment allows;
 - (2) to have their VA checked and recorded unaided first, then to fit their contact lenses and have their aided VA checked and recorded;
 - (3) to be warned that should other selection procedures prove successful they will be required to be in possession of spectacles and an appropriate prescription at their initial medical examination.
 - (4) Serial 83 of F Med. 1 is to be annotated "VA checked with CL only"

Ocular pathology

1. The following previous ocular pathology or surgery are a bar to acceptance for entry to the Royal Navy:
 - a. Intra-ocular transplants in young persons
 - b. Post penetrating injuries to either eye
 - c. Post keratotomy (RK) surgery for myopia
 - d. Post photo-refractive keratectomy
 - e. Post retinal detachment surgery
 - f. Keratoconus
2. If the examining doctor is in any doubt as to the candidate's acceptability he is to seek the opinion of the Adviser in Ophthalmology.

NB Refractive Surgery

- Personnel are to be informed that surgical and laser keratotomy is not available from service sources, and if carried out privately could well have an adverse effect on their future career by rendering them unfit for duty, due to potential side effects.
- Service personnel who have had corneal surgery carried out at their own expense are to be referred to a service consultant ophthalmologist for assessment when the highest medical category awarded will normally be P3. If serving personnel undergo LASIK then they will be categorised as P3 (Remedial) until seen by a Consultant Adviser in Ophthalmology and assessed, then reviewed by the medical panel, but are unlikely to be rated higher than P3 (Permanent). In selected cases however the Consultant Adviser in Ophthalmology may consider higher grading to be more appropriate.
- As new refractive surgery techniques are introduced these will be evaluated. Currently no one is accepted into the Navy having undergone refractive surgery of any type.

Near vision testing

Near visual acuity is tested using Times Roman print on reading charts approved by the British Faculty of Ophthalmologists (1951-52).

Colour Perception (CP)

1. There are four standards of colour perception graded as follows:

Standard	Test Specification
CP 1	The correct recognition of coloured lights shown through the paired apertures on the Holmes-Wright lantern at LOW BRIGHTNESS at 6 metres (20 feet) distance in complete darkness
CP 2	The correct recognition of 13 out of the first 15 plates of the Ishihara Test (24-Plate abridged Edition 1969) shown in random sequence at a distance of 75 cm under standard fluorescent lighting supplied by an artificial daylight fluorescent lamp (British Standard 950: 1967)
CP 3	The correct recognition of coloured lights shown through the paired apertures on the Holmes-Wright lantern at HIGH BRIGHTNESS at 6 metres (20 feet) distance in complete darkness
CP 4	The correct recognition of colours used in relevant trade situations, and assessed by simple tests with coloured wires, resistors, stationery tabs etc.

2. Personnel who fail to reach the minimum standard of colour perception are to be graded CP5 - failed trade test and colour expanses.

Methods of testing colour perception – Ishihara test

1. Ishihara plates are used as a screening for all entries.
2. Candidates who pass the Ishihara test are graded CP2 and require no further testing except for those whose critical visual task requires a categorisation of CP1.

3. Candidates who fail the Ishihara test are further tested for CP3 or CP4 according to requirement.

Methods of testing colour perception – Holmes-Wright Lantern

1. The Holmes-Wright Lantern is constructed to simulate, in controlled conditions, the critical visual task of seamen.
2. The test must be carried out at a distance of 6 metres (20 feet) in a completely darkened room. the candidate may wear spectacles if he wishes and may be 'dark adapted' if necessary. The colour pairs may be changed by rotating the colour setting flange at the rear of the lantern, the colour pairs presented being indicated by the code number visible in windows on each side and at the rear of the lantern.
3. Full Naval instructions on the operation of the lantern are available from the AOP office.

Retesting of colour perception

1. Colour perception does not normally change significantly throughout life. It will require retesting, therefore, only in certain circumstances:
 - a. before employment in a specialisation requiring a different colour perception standard as shown in the regulations, and
 - b. if there is any doubt concerning the existing grading.
2. Retesting is to be carried out by a Naval eye specialist at the request of a Medical Officer.

Binocular efficiency

Bifoveal fixation and perfect binocular functions are not essential requirements unless specified, but a squint must be cosmetically acceptable. Limits to heterophoria where applicable are as follows:

Function	Efficiency	Applicable
Maddox Rod @ 6 m	Esophoria 6 ^Δ Exophoria 6 ^Δ Hyperphoria 1 ^Δ	a) SD(X) b) Observers FL(X), SL,SD c) Engineering/ S&S Officers & ratings d) RM Pilots & Aircrew
Maddox Rod @ 33 cm	Esophoria 6 ^Δ Exophoria 16 ^Δ Hyperphoria 1 ^Δ	a) Observers FL(X), SL,SD b) RM Pilots & Aircrew
Other functions	Recovery on cover test must be rapid, convergence must be maintained at less than 10cm, stereopsis must be present	a) Observers FL(X), SL,SD b) RM Pilots & Aircrew

Spectacles and contact lenses

1. There is in general no restriction on the wearing of spectacles or contact lenses (including on board submarines) provided that the required corrected standards of visual acuity are met. Contact lenses may not, however, be worn under AGRs or by Aircrew. Those who may wear contact lenses and choose to do so must always have a pair of Defence spectacles to wear as an alternative. Defence spectacles are provided from public funds if required for the efficient performance of duties, contact lenses are not.

Use of contact lenses

1. Contact lenses may well provide advantages over spectacles enhancing peripheral vision and reducing reflection and aberration. They are also more compatible than spectacles with specialist equipment such as night vision goggles. Gas-permeable hard contact lenses cannot be recommended for military use as they cannot be worn on an extended wear basis should the need arise. Tinted lenses are also not permissible. The decision whether or not to wear contact lenses must remain with the individual. The individual must also be responsible for ensuring proper care of contact lenses. The vast majority of complications and ocular pathology arising from contact lens wear are associated with inadequate care of the contact lenses. Lenses must be of a soft type and are to be used on a daily wear basis but to have the facility for extended wear if required; that is to say that in normal working they should be inserted at the start of the working day and removed before any periods of sleep but could be left in for an extended period should the operational need arise. The extended period should not be more than seven days.
2. At all times a pair of spectacles of up to date prescription must be available to the individual. If either eye becomes red or painful the individual must remove both contact lenses and return to wearing his spectacles and report to a MO within 24 hours.
3. Contact lenses are not permitted in operational service diving.

Deterioration of eyesight in service

Any serving personnel whose unaided vision in the better eye falls below 6/60, or who requires correction of greater than ± 6.00 dioptres is to be referred for ophthalmic opinion and then to MBOS for determination of permanent medical category.

1. **Application of Revised Standard (1 Jan 95).** Revised eyesight standards which came into

operation with effect 1 Jan 95 apply to all personnel joining after that date and serving personnel on application for change of branch or Upper Yardsman/Special Duties List commission.

2. **Bridge Watchkeepers.** Officers with bridge watchkeeping responsibilities are required to remain within VA Standard II (corrected) and should be tested annually to ensure that this standard is maintained. Those with the following restrictions must be referred to the Consultant Adviser in Ophthalmology and thence to Medical Board of Survey (MBOS) to determine permanent medical category.
 - a. Those whose VA cannot be corrected to VA II
 - b. Those who require greater than 6 dioptres correction to achieve VA II
 - c. Those whose uncorrected vision is worse than 6/60 in either eye.
3. **Aircrew.** Aircrew who are found for the first time to require corrective lenses are to be refracted and then referred to Central Air and Admiralty Medical Board (CAAMB) for assessment of their flying medical category.
4. **Submarine Seaman Specialists.** Submarine seaman specialists whose correction is greater than ± 3.00 dioptres (i.e. outside the range of periscope optical correction) are to be referred for an ophthalmic opinion and thence to the Senior Medical Officer Submarines, Institute of Naval Medicine.
5. **Seaman Ratings.** Applicants for entry must meet Visual Standard II. However, OM ratings for AW/AWW specialisation must achieve Visual Standard I in service.

Refraction

These eyesight standards set limits to the amount of refractive error allowed and it is essential that this is determined at the entry medical examination:

- a. **Hypermetropia.** In a young person, considerable hypermetropia may be present without any apparent effect on either near or distance vision. To detect its presence and the amount, plus spherical lenses of successively increasing strengths should be placed in a trial frame in front of both eyes together and the effect on the candidate's distance vision is an approximate measure of the manifest hypermetropia present. Borderline cases should be referred to an ophthalmic specialist.
- b. **Myopia.** Short sight affects distance visual acuity and its presence is obvious. The candidates should be asked to provide a

spectacle prescription which will show the degree of myopia present.

Other abnormalities of the eyes or visual system.

Any abnormalities of the eye or visual system (congenital, traumatic or pathological) may be cause for rejection even though visual function is within the standard limits, a decision regarding visual fitness for duty must then be made by a consultant ophthalmologist.

Royal Marines GL/SS officer entrants

Royal Marines GL/SS Officer entrants who are CP4 may be accepted at the discretion of CGRM after advice from the Consultant Adviser in Ophthalmology.