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**Requirements For The Production Of
Welding And Burning Blankets And
Hanger Fire Curtains**

**Part 1
Silica Cloth For Welding
And Burning Blankets**

Incorporating NES 807 Category 3

Issue 2 Publication Date April 1989



AMENDMENT RECORD

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REVISION NOTE

This standard is raised to Issue 1 to update its content.

HISTORICAL RECORD

This standard supersedes the following:

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Ministry of Defence

Naval Engineering Standard

NES 807 Part 1 Issue 2 (Reformatted) April 1989

**REQUIREMENTS FOR THE PRODUCTION OF WELDING AND BURNING
BLANKETS AND HANGAR FIRE CURTAINS**

PART 1

SILICA CLOTH FOR WELDING AND BURNING BLANKETS

This NES Supersedes
NES 807 PART 1 ISSUE 1

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NAVAL ENGINEERING STANDARD 807

PART 1

ISSUE 2 (REFORMATTED)

REQUIREMENTS FOR THE PRODUCTION OF WELDING AND BURNING BLANKETS

AND HANGAR FIRE CURTAINS

SILICA CLOTH FOR WELDING AND BURNING BLANKETS

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SCOPE

1. The technical requirements for the production of silica cloth for use as a welding and burning blanket, or for the construction of fire boxes, when flame cutting structure in HM Surface Ships and Submarines.

FOREWORD

Sponsorship

1. This Naval Engineering Standard (NES) is sponsored by the Procurement Executive, Ministry of Defence, Chief Naval Architect (CNA), Section NA131.
2. It is to be applied as required by any Ministry of Defence contract for the manufacture of silica glass fabric as a welding/burning blanket for use in HM Surface Ships and Submarines.
3. This NES comprises: Requirements for the Production of Welding and Burning Blankets and Hangar Fire Curtains.

Part 1—Silica Cloth for Welding and Burning Blankets

Part 2—Proofed Cloth for Hangar Fire Curtains

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16. In the tender and procurement processes the related documents listed in each section and Annex A. can be obtained as follows:
 - (a) British Standards
British Standards Institution,
389 Chiswick High Road,
London W4 4AL
 - (b) Defence Standards
Directorate of Standardization and Safety Policy,
Stan 1, Kentigern House, 65 Brown Street,
Glasgow G2 8EX
 - (c) Naval Engineering Standards
CSE3a, CSE Llangennech, Llanelli,
Dyfed SA14 8YP
 - (d) Other documents
Tender or Contract Sponsor to advise.

Note: Tender or Contract Sponsor can advise in cases of difficulty.

17. All applications to Ministry Establishments for related documents are to quote the relevant MOD Invitation to Tender or Contract Number and date, together with the sponsoring Directorate and the Tender or Contract Sponsor.
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19. This NES may call for the use of processes, substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and in no way absolves either the supplier or the user from statutory obligations relating to health and safety at any stage of manufacture or use. Where attention is drawn to hazards, those quoted may not necessarily be exhaustive.

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1. TYPE APPROVAL

- a. Before a manufacturer may supply this type of material the products must be accepted by the Approving Authority as complying with the requirements of this NES. The Approving Authority for this material is the Procurement Executive, Ministry of Defence, CNA, Section NA131.
- b. To obtain type approval the manufacturer must comply with Clauses 1.c., 1.d. and 1.e..
- c. Samples and test data of the material the manufacturer proposes to supply are to be provided. Test data are to contain results of all the tests required by Section 4. of this NES.
- d. Before a manufacturer is accepted as a supplier of material to this NES he is to supply to the Approving Authority or to the Ministry's adviser on occupational hygiene, full particulars of the chemical constituents of the finished material together with any other information necessary to enable an assessment of the occupational hazard to be made. For fibrous components, information on the fibre characteristics is also to be supplied. When the material is intended for use in HM Submarines additional information will be sought to enable consideration to be given to any harmful effect the material may have on the closed environment of the submarine. Any such information will be treated strictly in confidence.
- e. Recommendations for the safe handling of the material are to be provided.
- f. In selecting materials or substances to meet this NES, the manufacturer is to take into account their relative toxicity or health hazard. Preference will be given by CNA to those materials which, while meeting the technical requirements of this NES, create the least hazard in their storage, handling, application, removal and disposal.
- g. If any change is made in the formulation or make-up of the material after initial acceptance, full particulars of the changes are to be supplied to the Approving Authority so that acceptability of the material can be reconsidered.

2.

MATERIAL

- a. The yarn is to be made from Type E glass, defined in BS3396 Part 1, to give, after chemical processing, a minimum amorphous silica content of 96%.
- b. The yarn for both the warp and weft of the cloth is to be a 4 ply twisted continuous filament yarn.

3. MANUFACTURE

3.1 Fabric

- a. The cloth is to be an 8 or 12 shaft satin weave. The yarns are to be as specified in Section 2. and have 185 warp ends and 140 weft picks per 10 cm. A tolerance of $\pm 10\%$ will be permitted.

3.2 Silica Content

- a. The loom – state cloth is to be chemically treated to leave the yarn at a minimum silica content of 96% measured as SiO_2 .

3.3 Weight

- a. The weight of the finished cloth is to be a minimum of 1175 g/m^2 and maximum of 1350 g/m^2 . The weight is to be determined by the method described in BS3396 Part 1 App C.

3.4 Width

- a. The width of the finished cloth, including the selvedge, is to be $91 \text{ cm} \pm 1 \text{ cm}$.

3.5 Length

- a. The cloth is to be supplied in rolls of 50m nominal length, but roll lengths between 40m and 60m will be acceptable.

3.6 Selvedge

- a. The cloth is to be uniformly woven. The selvedge is to be well made, substantially straight and even, and is to have the same tension as the remainder of the cloth. An untucked feathered selvedge is not acceptable.

3.7 Finish

- a. The silica cloth is to be given a finishing treatment to improve its resistance to abrasion.

4. TESTING

- a. The tests detailed in Clauses 4.1.a., 4.2.a., and 4.3.a. are to be carried out once for each order or production batch. For Type Approval the test in Clauses 4.1.a. to 4.6.a. inclusive are to be undertaken.

4.1 Visual Inspection

- a. The finished cloth is to be visually inspected by passing the whole length over a suitable illuminated table. The cloth is to be clean and free from oil or grease spots. It is to be free of creases, wrinkles or other permanent distortions or defects.

4.2 Breaking Strength

- a. One test sample is to be tested per 200m of cloth in accordance with Clause 4.3.a.

4.3 Breaking Strength Test

- a. The average breaking strength is to be determined as described in BS 3396 Pt 1 App D and is not to be less than 30 kN/m in the warp direction and 20 kN/m in the weft direction.

4.4 Flame Cutting Test

- a. When tested in accordance with Clauses 4.4.c., 4.4.d. and 4.5.a., the cloth is to be considered to pass if there is no penetration of the molten slag and if the steel off-cut is supported by the test cloth.
- b. An 800mm square sample of the test cloth is to be firmly held (in the horizontal plane) on a steel frame.
- c. A mild steel plate 15mm thick \times 200mm wide of random length is to be mounted so that one end of the plate is positioned centrally 600mm above the cloth and parallel to the plane of the cloth.
- d. A 20mm wide piece of the steel plate is then to be flame cut using standard hand-held gas cutting equipment; the molten slag and cut piece of plate is to be allowed to fall freely onto the test cloth.

4.5 Smoke Index

- a. The smoke index of a sample of the finished cloth is to be determined by the test method in NES 711. The level of acceptance requires an index less than 50.

4.6 Toxicity Index

- a. The toxicity index of a sample of the finished cloth is to be determined by the test method in NES 713. The level of acceptance requires an index less than 5. Halogenated materials are not to be included in the cloth composition.

4.7 Test Certificates

- a. Test certificates giving the results of tests required in Clauses 4.1.a. to 4.3.a. are to be retained for inspection by the Quality Assurance Representative named in any contract.

4.8 Rejection

- a. Should the samples selected fail to meet any of the test requirements given in Clauses 4.1.a. to 4.3.a. inclusive two further samples will be allowed. If either of these samples fail to meet the requirements the facts are to be reported to the Approving Authority.

5. PACKAGING AND IDENTIFICATION

5.1 Packaging

- a. The cloth is to be rolled tightly and evenly onto rigid tubes to produce a firm package and to prevent collapsing or telescoping during transit and storage.
- b. Both ends of the roll are to be suitably protected to prevent damage to the selvages of the fabric.
- c. Each roll is to be individually wrapped in a suitable robust, moisture-proof wrapping but not polyvinyl chloride (PVC) or any other halogenated polymer film, and securely packaged in a carton or hessian sack.
- d. A printed label bearing the following information is to be fixed on each carton or sack.

‘DO NOT STAND ON END’

5.2 Identification

- a. Each package is to bear a label, clearly visible, giving the following information:
 - (1) Description of contents.
 - (2) Fabric length in metres and width in cm.
 - (3) Contract or order number and date.
 - (4) Manufacturer’s batch number.
 - (5) Manufacturer’s identification, (eg firm’s name).
 - (6) NATO stock number.

ANNEX A.

A. RELATED DOCUMENTS

a. Reference is made to:

		Referred to in Clause
BS 3396 Pt 1	Woven glass fibre fabrics for plastics reinforcement, Pt 1. Loom-state fabrics	2.a., 3.3.a., 4.3.a.
NES 711	Determination of the Smoke Index of the Products of Combustion from Small Specimens of Materials	4.5.a.
NES 713	Determination of the Toxicity Index of the Products of Combustion from Small Specimens of Materials	4.6.a.

ANNEX B.

B. DEFINITIONS AND ABBREVIATIONS

a. For the purpose of this NES the following definitions apply:

End	a single warp thread as woven.
Pick	a single weft thread as woven.
Thread	the result of twisting together in one or more operations two or more single folded or cabled yarns.
Warp	thread placed lengthways in a fabric as woven.
Weft	thread placed widthways in a fabric as woven.
Yarn	a product of substantial length and relatively small cross section of glass continuous filament, with or without twist.

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