

NOTE.—The Institution desires to call attention to the fact that this Specification is intended to include the technical provisions necessary for the supply of the material herein referred to, but does not purport to comprise all the necessary provisions of a contract.

**British Standards Institution,**

Incorporated by Royal Charter.

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE.

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**BRITISH STANDARD SPECIFICATION**

FOR

**RUBBER SHOCK ABSORBER CORD**

FOR AIRCRAFT PURPOSES.

1. **Construction.** The cord shall be made of multiple threads of rubber tightly encased in two coverings of cotton braid, and shall be as smooth and as uniform as possible.

2. **Diameters of Finished Cord.** The overall diameter, including the braid, shall be as follows:—

in.	in.
$\frac{1}{4}$	$\frac{5}{8}$
$\frac{5}{16}$	$\frac{3}{4}$
$\frac{3}{8}$	$\frac{7}{8}$
$\frac{1}{2}$	

A tolerance of plus or minus 10 per cent shall be permitted on the overall diameter.

3. **Quality of Rubber Thread.** (a) The rubber forming the threads shall be compounded and vulcanised so as to give the maximum possible life. No waste or reclaimed rubber or rubber substitute shall be used.

(b) Square-section thread shall be made from first grade Hevea rubber.

(c) Round-section thread shall be made from high grade rubber latex.

4. **Sizes of Rubber Thread.** The size of the rubber thread shall be in accordance with Clause 6, Tables A and B. Only one size of rubber thread shall be used in any one cord. A tolerance of plus or minus 5 per cent shall be permitted on the respective sizes.

5. **Braiding.** (a) Both the inner and outer coverings shall be made of two-fold cotton yarn in the grey; the inner covering shall be of soft cotton and the outer covering of hard polished glacé cotton.

(b) The outer covering shall have a helix of red cotton thread running throughout its length, and the pitch of the braiding, as indicated by the coloured thread, shall be uniform throughout the length of the cord.

(c) The inner covering shall have a helix of cotton thread of approved colour running throughout its length to denote the Manufacturer of the cord.

(d) The construction of the braid shall be such that when the cord is stretched to 105 per cent extension no rubber shall be visible.

6. **Number of Rubber Threads.** The number of rubber threads used in each cord shall be in accordance with the following tables:—

TABLE A. SQUARE THREADS.

Diameter of Cord	Minimum Number of Rubber Threads					
	in. $\frac{1}{20}$	in. $\frac{1}{22}$	in. $\frac{1}{24}$	in. $\frac{1}{26}$	in. $\frac{1}{28}$	in. $\frac{1}{30}$
in. $\frac{1}{4}$	42	50	60	70	82	94
$\frac{5}{16}$	66	80	95	112	130	149
$\frac{3}{8}$	95	114	136	160	186	213
$\frac{1}{2}$	172	208	247	290	336	386
$\frac{5}{8}$	266	322	383	450	522	600
$\frac{3}{4}$	383	464	552	648	752	864
$\frac{7}{8}$	520	630	750	880	1020	1170

TABLE B. ROUND THREADS.

Diameter of Cord	Minimum Number of Rubber Threads					
	in. $\frac{1}{20}$	in. $\frac{1}{22}$	in. $\frac{1}{24}$	in. $\frac{1}{26}$	in. $\frac{1}{28}$	in. $\frac{1}{30}$
in. $\frac{1}{4}$	53	63	76	90	104	119
$\frac{5}{16}$	84	100	121	143	165	190
$\frac{3}{8}$	120	143	173	204	236	271
$\frac{1}{2}$	219	264	314	369	427	491
$\frac{5}{8}$	338	410	487	573	664	764
$\frac{3}{4}$	487	590	701	825	956	1100
$\frac{7}{8}$	660	800	950	1120	1300	1490

7. **Mechanical Properties of the Cords.** The mechanical properties of the cords shall be as specified in the following table when determined by the method specified in Appendix 1.

Diameter of Cord	Load in lb. to give 10 per cent extension	Load in lb. to give 100 per cent extension			Load in lb. in addition to actual load producing 100 per cent extension to give an extension of 105 per cent of the initial length of the finished cord
		Finished Cord		With outer braiding removed	
in. $\frac{1}{4}$	min. 7	min. 31	max. 40	Shall be not less than 45 per cent or more than 55 per cent of the actual load obtained on each finished cord.	max. 7
$\frac{5}{16}$	10	50	63		10
$\frac{3}{8}$	15	70	90		15
$\frac{1}{2}$	30	130	155		25
$\frac{5}{8}$	42	200	240		40
$\frac{3}{4}$	60	288	346		58
$\frac{7}{8}$	90	380	450		75

After removal of the loads, recovery to the original dimensions shall be prompt and complete.

8. **Date of Manufacture.** Coloured cottons shall be included with the rubber thread in the finished cord to indicate the date of manufacture of the finished cord.

The colours shall be as follows:—

Year.		Colour.
1940	45 50 55	Yellow
1941	46 51 56	Blue
1942	47 52 57	Red
1943	48 53 58	Green
1944	49 54	Heliotrope

After 1944 the colours shall be repeated in the same sequence as above for each following group of five years.

The number of coloured cottons to be included shall be as follows:—

For cord made between January 1st and March 31st inclusive	1.
"    "    "    "    April 1st and June 30th	2.
"    "    "    "    July 1st and Sept. 30th	3.
"    "    "    "    Oct. 1st and Dec. 31st	4.

9. **Tests on Finished Cord.** Each coil of finished cord shall be tested at three places, selected indiscriminately throughout its length, and the test results at each point shall be in accordance with the loads and extensions set out in the table in Clause 7.

No mechanical test shall be carried out within 3 feet of either end of each coil.

#### APPENDIX 1.

##### Method for the Determination of the Mechanical Properties of the Cords.

The temperature of the test room shall be between 55° and 75° F. (preferably 65° F.). The cord shall be kept at the temperature at which it will be tested for not less than 12 hours prior to being tested. The portion of the cord to be tested shall be stretched three times to 100 per cent extension before actually testing. The mechanical properties shall be determined on the test length "in situ" in the coil.

The length of the test sample immediately before each actual test shall be 5 inches, and the pull shall be made in an approved testing machine.

When the temperature of the cord at the time of test is not 65° F. corrections, as shown in the following table, shall be applied to the specified "load in lb." as given in Clause 7, for each variation of 5° F.

##### CORRECTIONS FOR TEMPERATURE.

Percentage Extension	For each 5° F. increase of temperature	For each 5° F. decrease of temperature
10	Plus 3.5 per cent	Minus 3.5 per cent
100	Minus 5.0 per cent	Plus 5.0 per cent
105	Minus 10.0 per cent	Plus 10.0 per cent

This Specification having been approved by the Aircraft Industry Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council of the Institution as a British Standard on 4th November, 1940.

#### NOTE.

*In order to keep abreast of progress in the Industries concerned, the British Standard Specifications are subject to periodical review.*

*Suggestions for improvements, addressed to the British Standards Institution, 28 Victoria Street, London, S.W. 1, will be welcomed at all times. They will be recorded and in due course brought to the notice of the Committees charged with the revision of the Specifications to which they refer.*