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JOINT FIRE RESEARCH ORGANIZATION

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A NOTE ON THE BURSTING PRESSURE OF FLAT-WOVEN  
UNLINED CANVAS FIRE HOSE

by

P. H. Thomas

Summary

Comparable data obtained by the Joint Fire Research Organization and by the Ministry of Works Inspectorate, on the bursting pressure of flat-woven unlined canvas fire hose made to various specifications of the Ministry of Works, do not give the same results for bursting strength performance. The data from tests at the Joint Fire Research Organization suggest a lower average bursting strength than do the Ministry data.

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File No.

Fire Research Station,  
Boreham Wood,  
Herts.

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Introduction

At the request of Technical Committee LIT/4 of the British Standards Institution, the Joint Fire Research Organization have analysed some of the data on the bursting pressure of 3-foot lengths of flat-woven unlined canvas fire hose, obtained by the inspectors of the Ministry of Works at the manufacturers' works. A comparison was made with data obtained in tests carried out on similar hose at the Joint Fire Research Organization, only those data in which the hose tested by the Joint Fire Research Organization could be identified by a Ministry of Works Contract Number being used. Since tests carried out at the Joint Fire Research Organization (1) on hose with five or ten per cent alkaline soluble content, with and without burnettizing treatment, and with and without lauryl pentachlorophenol treatment during manufacture, have shown no significant effect of these factors on bursting strength, such data have been included irrespective of treatment.

The test results obtained from the Ministry of Works are shown in Table I. The analysis of all the data is given in Table II.

Certain data have been disregarded where the evidence suggests a result to be doubtful. For example in the Ministry of Works data for S.D. hose of make B there were 25 test results ranging from 410 lb in.<sup>-2</sup> to 510 lb in.<sup>-2</sup> with a mean value of 442 lb in.<sup>-2</sup> and one report of a test in which 620 lb in.<sup>-2</sup> was reached without a burst. The statistical odds against this hose coming from the same population as the others are of the order 10,000 to 1. In no case has the omission or inclusion of such data been of practical consequence to the conclusions of the report. Since it may be assumed that the test figures were rounded down to the nearest 5, 10 or even 25 lb in.<sup>-2</sup> corrections should be applied to the sample data. This has been done where it was thought required, but again they are of little consequence.

Conclusions

- (1) For the data considered, the mean bursting strengths of flat-woven hose as given by the Ministry of Works tests are significantly higher than those given for hose of the same make, specification and contract number by tests at the Joint Fire Research Organization.
- (2) The standard deviation of the results of the Joint Fire Research Organization is 35 lb in.<sup>-2</sup>, there being no significant variation from one set of data to another. The Ministry of Works' values of standard deviation vary between 9 lb in.<sup>-2</sup> and 41 lb in.<sup>-2</sup> for the six sets of data.



TABLE II

Comparison of J.F.R.O. and M.O.W. data. Bursting strength of flat-woven flex wire hose lb.in.<sup>-2</sup>

Make Specn.	M.O.W. Contract No.	J.F.R.O. $\bar{x} \pm \sigma_m$	J.F.R.O. $\sigma$ (individ.)	M.O.V. $\bar{x} \pm \sigma_m$	M.O.V. (individ.) $\sigma$	Test method (Spec.)		Test method (J.F.R.O.)		Remarks
						Soak 100 lb. in. <sup>-2</sup>	Pressure rise	Soak 100 lb. in. <sup>-2</sup>	Pressure rise	
A	(1)	440 ± 10	35	532 ± 5	15	30 min.	100 lb.in. <sup>-2</sup> min <sup>-1</sup>	30 min.	100 lb.in. <sup>-2</sup> min <sup>-1</sup>	SD specification is not explicit as to method of test and has been presumed to be same as FB specification.
A	(2)	465 ± 17	38	546 ± 9	30	"	"	"	"	
B	(2)	415 ± 15	34	442 ± 5	26	"	"	"	"	
A	(3)	391 ± 18	41	448 ± 1	9	15 min.	Not more than 200 lb.in. <sup>-2</sup> min <sup>-1</sup>	"	"	
C	(3)	454 ± 13	29	488 ± 7	41	"	"	"	"	
D	(3)	400 ± 16	35	455 ± 3	41	"	"	"	"	

$\bar{x}$  = mean value for specimens in sample.  
 $\sigma_m$  = standard deviation of sample mean.

Method of selection of specimens

- 1) Ministry of Works - one 3 ft. length from one full length in fifty.
- 2) Joint Fire Research Organization - three 3 ft. lengths from one full length sent for test.