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THE EFFECT OF WATER-REPELLENT FINISHES ON THE FLAMMABILITY
OF BATTLE-DRESS SERGE

by

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Fire Research Station,
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Battle-dress serge has often to be waterproofed and the purpose of these tests was to determine the effect of these treatments on the flammability of the material. These were supplied by Ministry of Supply (MX5). Samples of the untreated battle-dress serge were supplied, together with samples treated with Velan, Mystolene and a silicone water-repellent. Details are given below in Table 1.

TABLE 1

Materials tested

Weight of fabric		Weight of treatment		Treatment
oz/sq yd	g/cm ²	Material	Per cent	
14	0.048	Battle-dress	-	-
"	"	"	5	Velan
"	"	"	4	Mystolene
"	"	"	2 $\frac{1}{2}$	Silicone

This particular material may be exposed to the normal hazards of everyday life, to heat flash from an atomic bomb or to flame throwers. Any discussion of the effect of the water-repellent treatments must consider all these hazards.

2. Discussion

Battle-dress serge normally presents an extremely low fire hazard. It is difficult to ignite (1), it will not continue to burn without supporting radiation and the protection it gives against conducted heat, though not great, is high compared with most other clothing materials (2, 3).

The ignition of materials depends upon composition, weight per unit area, treatment, colour and moisture content, and of these, colour will normally be important only in atomic explosions and even then for the present problem only if the treatment changes the colour. The weights of application of the treatments used do not alter the weight per unit area appreciably nor the thickness which controls the thermal resistance. Any alteration in fire hazard will therefore be due to the effect of the treatment upon composition, and could be determined from a simple comparative test. Unless this test showed a gross difference in the behaviour of treated and untreated materials an elaborate test would be unnecessary.

For materials such as battle-dress serge which normally present an extremely low fire hazard, any gross deterioration in performance, as a result of treatment could be detected by applying a lighted match or other similar small source.

A strip of material was hung vertically. On none of the materials would the flame of a match spread over the surface igniting the surface, except that a few local spots of flame appeared where the match flame was applied and disappeared when the match flame was removed. Except that a match was used instead of a bunsen burner, the test is the same as that given in B.S. 1547.

The use of these waterproofing agents does not appear to increase the flammability of the battle-dress serge material.

References

1. Simms, D. L. and Walters, J. E. L. The ignition of textiles by radiation. Department of Scientific and Industrial Research and Fire Offices' Committee Joint Fire Research Organization. F.P.E. 60/1951.
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