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MEDICAL RESEARCH LABORATORY



U. S. Naval Submarine Base
New London

EVALUATION OF THREE WATERLESS HANDCLEANERS

MEMORANDUM REPORT NUMBER 56-2

NM 002 015.14.03

19 January 1956

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ABSTRACT

An evaluation of three waterless handcleaners was undertaken aboard two submarines during protracted operations. A thirty day supply was furnished the submarines, and appropriate explanations were given to the personnel involved in the acceptance tests. The shipboard tests were conducted under the direct supervision of a Medical Officer and a Chief Hospital Corpsman.

Approximately forty people used the waterless handcleaners exclusively during the test. PLY, manufactured by the Milburn Company, cleaned all the dirt, oils, grease and paint encountered, and was very acceptable to the personnel. PAX, LIGHT DUTY had a limited cleaning capacity under the situation of the test but also had a high acceptance factor. SULPHO Hand Cleaner had a low personnel acceptance factor because of a residual stickiness and was abandoned during the test because of this condition. There was no evidence that any of the products caused any skin irritation, offensive odors, or delay in healing. Most of the personnel involved in the test felt that the use of a waterless handcleaner was very satisfactory, specifically in the engineering and electrical compartments.

SUMMARY PAGE

The Problem

To ascertain whether the waterless handcleaners considered, namely, SULPHO Hand Cleaner, PLY, PAX, LIGHT DUTY submitted by the West Disinfecting Company, the Milburn Company and the G. H. Packwood Manufacturing Company, respectively, are satisfactory for use on submarines.

Findings

No examples of sensitivity reaction occurred during the tests that could be directly attributed to the compounds under consideration. The paste products cleaned better than the liquid product under the conditions of this test. PLY was found to be a satisfactory product for use aboard submarines; PAX, LIGHT DUTY was satisfactory for all light soiling, but was not satisfactory for heavy carbon deposits encountered with diesel engine overhaul. SULPHO Hand Cleaner was not considered satisfactory for use aboard submarines because of its low consumer acceptability, since it leaves a persistent sticky feeling on the skin.

indications

The appropriate use of a waterless handcleaner will contribute to the conservation of water. There is no indication that any of these products are superior to similar preparations in the GSK catalog.

Published by the Naval Medical Research Laboratory
For Official Use

ADMINISTRATIVE INFORMATION

Tests to determine the suitability and feasibility of using waterless handcleaners aboard submarines were authorized and initiated at the request of Commander Submarine Force, U. S. Atlantic Fleet, by his END-1, (FF4, J19, Ser 338 of 27 October 1954), to Bureau of Medicine and Surgery, request contained in letter BUMED 714-B:bla-J19 of 29 September 1954. Bureau of Medicine and Surgery letter BUMED-7231-JS-1c, J19 of 27 December 1954, gave permission for the evaluation of additional products of this type.

REPORT OF INVESTIGATION

Introduction

The U. S. Naval Medical Research Laboratory is engaged in the field of medical research as it applies to submarine operations and diving operations. For this reason the laboratory is greatly interested in all problems of general health aboard submarines. Water conservation and cleanliness during prolonged operations are continual problems in submarines. At the suggestion of several sources, and at the request of the Commander Submarine Force, U. S. Atlantic Fleet, the Medical Research Laboratory evaluated one such product that was commercially available and made a report in May of 1955 (1). This second and concluding report concerns three additional products also available commercially.

Description of Products

All the test materials were provided by the respective manufacturers at no expense to the Navy. SULPHO Hand Cleaner, manufactured by the West Disinfecting Company, 42-16 West Street, Long Island City 1, N. Y., is a liquid, and appears on the General Services Administration Federal Supply Service Contract as GS-03S-14097. According to information provided in correspondence with the manufacturer, the product contains bacteriostatic hexachlorophene and sulphonated vegetable oils. It has a "neutral pH" and "will not defat the skin." PLY Waterless Handcleaner, Odorless, is manufactured by the Milburn Company, 3246 East Woodbridge, Detroit 7, Michigan. According to the manufacturer, PLY Waterless Handcleaner "contains no ammonia, halogenated or aromatic (ring) solvents; has no free alkali - pH7; contains lanolin, does not dehydrate the skin; and protects the natural acid mantle of the skin (pH6)." PAX, manufactured by the G. H. Packwood Mfg. Co., 1545-55 Tower Grove Avenue, St. Louis, Mo., is described by that company as a light duty

cleaner and "is scientifically formulated and processed so that it will not redden, dry, or alkali-burn the normal skin. -- Contains none of the ingredients that leave a solvent odor or cause chemical drying of the skin." PLY and PAX are both pastes.

Method and Results of Test

Two submarines were designated by Commander Submarine Force, U. S. Atlantic Fleet, to take part in the shipboard, underway, crew acceptance tests. Some of the products were supplied with dispensers. At the beginning of the cruise the crew personnel were instructed to use the handcleaner at all times until the supplies were exhausted. The purpose of the test, and the salient points of observation were described. Paper towels were provided to remove the handcleaner after each use. The personnel from the Engineering and the Gunnery Departments were instructed to use the cleaners.

At the exhaustion of the supplies all personnel were interviewed by the Medical Officer or by the Chief Hospital Corpsman aboard the particular submarines.

The generally prevailing opinions as recorded by the Medical Officer were as follows:

1. The idea of a waterless handcleaner for engine room, auxillary machinery, and electrician personnel was favorably regarded.
2. Rags were preferred to paper towels for the removal of the handcleaner.
3. No skin irritation or objectionable odors were noted with either paste product. Areas of skin lesions showed no irritation or interference with skin healing.
4. Water conservation could be appreciable if the handcleaner were used continually.
5. Personnel whose jobs produced much skin soiling were enthusiastic, while those who had little difficulty with skin soiling were not interested.

Specific Findings in Relation to Each Product

SULPHO Hand Cleaner, West Disinfecting Company. (a liquid)

1. Cleansed well.
2. Left the hands sticky, even though they felt dry.
3. Only a few men persisted in the use of this product for one week. The rest discontinued the test of their own accord because of the constant sticky sensation.
4. It was felt that the plastic dispenser was too flimsy for use with this product and dispensed the product too slowly.

PLY, Waterless Hand Cleaner, Milburn Company. (a paste)

1. Cleansed well for heavy soiling, oil, grease and paint.
2. Rags were used successfully in removing product after cleansing.
3. The product was initially firm, of uniform consistency, then turned thin and oily, and later became firm again. This did not seem to be related to ambient temperature.
4. Some of the men stated that the product left the hands feeling clean and soft.

PAX LIGHT DUTY, G. H. Packwood Mfg. Co. (a paste)

1. PAX LIGHT DUTY cleaned all light soiling, but did not serve satisfactorily for the heavy soiling encountered in the engine room spaces.
2. Several observers felt that it worked better with water, hence defeating its purpose. Water was necessary to remove product from around the finger nails.
3. Product was best removed with rags.
4. Consumer acceptability was good.
5. The product appealed to some as a preventative measure which minimized chapping.

Opinions of the Field Medical Officer

PLY was acceptable because:

1. It met the cleaning requirements;
2. It had a high consumer acceptability;
3. There was no evidence on this test of medical contraindication; and
4. An appreciable conservation of water may be anticipated from the correct use of the product.

PAX was suitable for light cleaning only. For use on a submarine, it is considered less suitable because:

1. It is not as effective as a cleaner; and
2. The use of some water is apparently required to successfully remove the product.

SULPHO Hand Cleaner was considered not suitable for use on submarines because:

1. Its consumer acceptability was very low; and
2. It leaves a sticky sensation on the hands.

DISCUSSION

The use of waterless handcleaners aboard submarines would have two advantages: the conservation of water, thus conserving power; and the maintenance of cleanliness among the personnel. Both of these advantages have definite general medical and health values, and each must be considered in the acceptance of any products, or materials, for use aboard submarines. Personnel acceptance and storage space are two additional important considerations for acceptance.

No direct complaints of skin irritation were made related to any of these products. This freedom from skin problems is specifically important. Unfortunately the tests were not long enough in time to eval-

uate any chronic effects of continual use of the products. Skin drying and defatting also could not be evaluated.

Bailed rags and waste cotton were considered best for removing the product from the skin after usage. Paper toweling was not considered satisfactory. This is an advantage for submarine use, as paper toweling would present a definite storage problem.

As suggested in a previous report (1), small sturdy dispensers would be very useful. Large containers represent a handling problem, while a small dispenser would permit satisfactory preservation of the products over a period of time.

Several persons commented that the products in this test were similar to products available from the General Stock Federal Catalog. There were no definite preferences, nor were any of the Federal stock preparations available for comparison.

CONCLUSIONS

1. Waterless handcleaners are acceptable to submarine personnel.
2. The proper use of waterless handcleaners represents a considerable conservation of water.
3. Of the three products tested, PLY was considered most suitable for use on submarines.
4. PAX LIGHT DUTY was considered less suitable for use on submarines. No tests were made with any other type of PAX.
5. SULPHO Hand Cleaner was not considered suitable for use on submarines because of the low consumer acceptance. The stated reason for the low acceptability was the sticky feeling left on the skin after usage.

REFERENCE

1. Evaluation of Waterless Handcleaner SBS-30 submitted by the Sugar Beet Products Corporation, Medical Research Laboratory Memorandum Report 55-2, BUMED Proj. NM 002 015.14, 20 May 1955.