jar. The cloth is placed in the jar, the cap screwed on tight, and the jar set in a constant temperature oven at 50° C. for a period of two weeks. During this period the cap is removed from the jar for a minute or two once every day to insure an ample supply of oxygen at all times. If, at the end of this period, the cloth has developed a decidedly rancid odor or has yellowed at all, it should be considered unfit for use. Ordinarily, one would assume that a sulfonated oil made from an oil of low iodine number would be less likely to oxidize than one made from an oil with a high iodine number. This does not hold true, however, because a poor sulfonation of a low iodine oil may cause a "cracking" of some of the larger fat molecules with the subsequent formation of lower molecular weight, unsaturated compounds. Then, again, with proper sulfonation and after-treatment, a relatively high iodine oil may yield a product which is quite free from any tendency to oxidize.

There are several other specifications of minor importance which finishing oils are sometimes called upon to meet. However, time will not permit to discuss them in this paper.

Most of the requirements and specifications which are imposed upon the sulfonated oils of today by the textile industry are dependent, not so much upon the characteristics of the raw oils from which these products are made, as upon the properties which the sulfonated oil manufacturer has been able to incorporate into his product. In other words, the choice of raw materials for use in the manufacture of finishing oils is not as important as are the methods by which they are sulfonated and after-treated. Sulfonation may alter the chemical and physical characteristics of an oil to such an extent that, as far as analysis is concerned, the oil is unrecognizable. The iodine number, titer, saponification value, acetyl value and the color and odor may be greatly changed. The finished oil may contain large or small amounts of organically combined sulfur trioxide, free fatty acids or combined alkali. Each and all of these active groups are dependent, not so much upon the raw oil, as upon the method of manufacture; and upon these characteristics of the finished product depend its usefulness in the processing of textiles.

REPORT OF

SAMPLING COMMITTEE, A. O. C. S., 1935

I. Suitable bands or rings were substituted for handles on the official oil sampler and were tried out by some members of the Committee. They were found to be less convenient than the handles, however, and the latter are recommended as standard equipment on the sampler.

II. A year ago the Sampling Committee proposed a tentative method for the sampling of oils and fats in ships' tanks and shore tanks to be tried for a period of one year, during which time suggestions and criticisms were invited. No criticisms have been received, and it is felt that this constitutes tacit approval of the proposed method. A few changes in wording have been made for the sake of clarity, but the substance of the proposed methods has not been changed. The Sampling Committee recommends that the following methods be adopted:

A. All oils to be sampled shall be in a liquid or semi-liquid condition so as to permit the sampling device to settle readily to the bottom. If not in condition to sample, the oil or fat shall be warmed sufficiently to bring it to this condition without damaging the quality.

B. For sampling purposes, ships' tanks and shore tanks are divided into two groups as follows:

1. Those tanks in which a sampler can be lowered vertically to the lowest part of the tank.
2. All other tanks.

C. For sampling oils or fats in tanks of Group 1, a bomb type or core type sampler of approved design shall be used. Sampling shall begin at the lowest point in the tank, and not more than 0.5″ above the bottom, and samples must be taken at consecutive one-inch levels until a level has been reached showing no free water, dirt, stearine or sludge. Above this level samples shall be taken at consecutive levels of one foot until the top of the oil has been reached. The sampling device shall in every instance be completely filled on being withdrawn, and the samples so obtained composited in the proportion each represents to the total depth of the oil in the tank sampled. For example, the samples taken at successive one-inch levels being representative of the total depth of twelve inches or one foot, and the entire depth of the oil being twenty feet, then the samples would be combined in the ratio of one part of the composite of those taken at one-inch levels to nineteen parts of the composite of those taken at the higher levels.

D. Oils or fats in tanks of Group 2 cannot be accurately sampled for moisture or settlings. If the contract or trading rules require the acceptance or rejection of the oil before it is moved from the tanks the official in charge shall secure the most representative sample possible under the conditions, but this sample shall be considered to represent only the quality of the settled oil. In order to determine the amount of moisture and settlings in the oil, the oil shall first be pumped into tanks meeting the requirements of Group 1, and then sampled according to the methods described above, or a continuous bleeder sample shall be taken.

E. If bomb or core type sampling is impractical a continuous bleeder sample shall

be taken from the main pump line or lines. The pump line or lines shall be maintained in a vertical position at the point tapped, and the bleeder line or lines shall not be less than 3/8 inch diameter inside measurement at any point. The bleeder line or lines shall be kept continuously clear, and any visible change in color or quality of the oil during the course of pumping shall be duly noted. If more than one pump line is used to discharge the oil, the respective bleeder samples shall be thoroughly agitated and composited in the proportion each represents to the total quantity discharged.

F. Description of apparatus to be used in sampling oils or fats in ships' tanks or shore tanks.

a. Bomb-type sampler — A tightly closed cylindrical compartment fitted with a valve automatically opening on striking the bottom of the tank and capable of taking a sample within 0.5" of the bottom of the tank. In addition, the sampler shall be so constructed that the valve can be opened by hand, by means of a loaded line or cord, and the cylinder completely filled at any specified level in the tank or compartment, after which the valve can be closed and the sampler withdrawn without loss of any part of its contents. The device is to be readily cleanable and shall be kept clean and maintained in good working order during the use thereof.

b. Core type sampler — A hollow tube, sectional or otherwise, open at the end and capable of being lowered through the oil to the bottom of the tank, then closed tightly at the lower end and withdrawn without the loss of any part of its contents, or so fitted as to allow of being lowered through the oil to the bottom of the tank or compartment while tightly closed whereupon it can be opened along its entire length, allowed to completely fill, thereafter being tightly closed and withdrawn without loss of any part of its contents. The design shall be such that a sample can be taken within 0.5" of the bottom of the tank. The device shall be kept clean and maintained in good working order while in use. Sampling by means of such shall be through the oil to the lowest possible point in the tank or compartment in such manner to allow of procuring a fair representative longitudinal section of the oil.

Respectfully submitted,
SAMPLING COMMITTEE,
R. A. Duncan, Chairman.

REPORT OF THE COMMITTEE ON THE DETERMINATION OF STABILITY OF EDIBLE FATS AND OILS

IN THE first report of this committee after it was organized two years ago we stated that a thorough search through the literature was made for all methods that have been used or even suggested as a possible procedure to follow in estimating the stability of edible fats and oils. Our literature findings were supplemented by methods that have been tried in laboratories interested in testing the stability of fats and oils.

From this study the majority of the committee believed then and believes now that the two most useful accelerated tests for judging the relative keeping quality of edible fats and oils are the oxygen absorption test in its various forms and the active oxygen or peroxide test as developed by Lea; Taffel and Revis; Kilgore and Wheeler; and King, Roschen and Irwin.

A consideration of these two methods indicated that the active oxygen test could be adapted to routine laboratory operation more easily than an oxygen absorption method so all the work this committee has done has had to do with the active oxygen or peroxide method.

Since the committee reported a year ago the only new development that has come to our attention which improves the test is the use of dichromate in the place of permanganate in the air washing bottle. Other than this the test is used as described in our Journal.

As far as this committee is aware the active oxygen method for judging the stability of edible fats and oils is being used more and more all the time. Companies which have branch laboratories have equipped them with stability equipment and data on samples sent out by the parent laboratory to the branches furnish results that are in very close agreement and demonstrate that the active oxygen test for judging the relative keeping quality of fats and oils is dependable if the laboratories using it are properly supervised.

Results on co-operative samples submitted in our last year's report indicated very good agreement between 4 laboratories which regularly used the peroxide method for testing stability and not such good agreement between 2 other laboratories which had only recently installed the apparatus for making the test. Data on co-operative samples sent to 9 laboratories since our last report agree in about the way as did the results reported last year. The laboratories which were in agreement last year are, with the exception of a test on one sample, in agreement on these samples. The 2

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