# 1993 AATCC Standard Reference Detergent and Laundry Detergents in General

**Developed in 1995 by AATCC Committee RA88; revised 1981/1982, 1991, 1998 (with title change), 2005.**

## 1. Background/History

1.1 AATCC Standard Reference Detergent 124 was chosen to represent the type of washing product used for home laundering in the 1960s. The composition of this particular detergent, when adopted, was, except for suds level, typical of commercial laundry products used by most persons for home laundering. A variant formulation, AATCC Standard Reference Detergent WOB (without optical brightener), was the same but without a fluorescent whitener for use in colorfastness to laundering tests.[1] However, the proliferation of detergent formula variations and even of new types of detergent since 1970 have made Standard Reference Detergents 124 and WOB obsolete. The following paragraphs provide some perspective concerning the current laundry detergent situation and the current use of 1993 AATCC Standard Reference Detergent.

1.2 From the early 1950s until 1970 there was little change in U.S. laundry detergents in regard to product form and general composition. Practically all of the detergent products intended for clothes washing were phosphate-built synthetic detergents varying primarily in kind of surfactant (anionic or nonionic), suds level and, to a lesser extent, in phosphate level. At that time almost all industry detergent products contained phosphates in amounts corresponding to 12-14% calculated as elemental phosphorus. Most brands were in powder form but there were also some heavy duty liquids. Other types, collectively comprising less than 10% market share, were detergent pellets, a few brands of true soap products and unbuilt detergent powders (e.g., formulated with surfactant and inert filler).

1.3 A growing ecological concern with U.S. water quality during the late 1960s resulted in considerable social and political pressure for eliminating the use of phosphate in detergent products. By the end of the decade, vast changes in detergent formulation began which, at this writing, have not yet ceased.

## 2. Current and Future Trends in the Detergent Industry

2.1 In contrast to the period when high phosphate, low phosphate and nonphosphate detergents were sold simultaneously, the marketed laundry detergents today include: (a) nonphosphate carbonate-built powders, some of which may contain aluminosilicates (zeolites); (b) citrate-built heavy duty liquids; and (c) nonbuilt heavy duty liquids. Thus, the national brands are divided into three basic categories all of which are nonphosphate. Most detergents contain, besides surfactants and builders, ingredients to reduce caking (powders), fluorescent whiteners, antiredeposition agents, colorants, perfumes, suds control ingredients, and anticorrosives. Some of them may also contain enzymes, bleaches, bleach alternative ingredients and softeners (now rare). The market share for liquids vs. powders in the late 90s is approximately a 49/51 split with liquids showing a steady rise. This trend is expected to continue.

2.2 In the longer term, the detergent market will continue to change due to: availability and cost of materials, product costs, energy conservation, and environmental concerns (in both end use and manufacturing). Packaging and product dosage will also constantly change. Consumers will continue to use laundry aids such as chlorine and non-chlorine bleaches, laundry boosters, pretreating/prespotting agents, softeners (both rinse cycle and dryer types), borax, bluing, etc. The laundry products market will constantly undergo subtle changes in all areas beyond the year 2000.

## 3. Rationale for Using 1993 AATCC Standard Reference Detergent

3.1 With this background and especially the environmental concerns with the use of phosphates, it had become apparent that a change in the formulation of the AATCC Standard Reference Detergent was needed. Because all existing industry test data relative to effects of home laundering on commercial textiles are based on Standard Reference Detergents 124 and WOB, comparisons were made using a concentrated carbonate built powder with no enzymes or phosphates. The concentrated carbonate built powder formulation is representative of the types of products on the market in 1993. Enzymes were not added to the formula due to possible changes of enzyme strength over the storage life of the product.

3.2 Laboratory comparisons of Standard Reference Detergents 124 and WOB and the concentrated carbonate built powders both with and without optical brighteners indicated that no significant differences between the detergent formulations were seen except for oily stain removal. The new concentrated carbonate built formulas, named 1993 AATCC Standard Reference Detergent and 1993 AATCC Standard Reference Detergent WOB, were not as effective in removal of oily stains. This has been noted in the applicable test methods. Laboratory comparisons between 1993 AATCC Standard Reference Detergents and currently marketed products would likely show differences in washing performance. However, comparison among currently marketed products could also show differences of similar or even greater magnitude.

3.3 One of the factors leading to possible differences between results using the 1993 AATCC Standard Reference Detergents and current detergent products is water hardness. In hard water situations, the 1993 AATCC Standard Reference Detergents may give better soil removal results because they are more effective across a broader range of hardness than most commercially available products.

3.4 Users of standard test methods involving laundering need to be aware that other Standard Reference Detergents are used in various ISO test methods. These detergents are specified in methods designed for home laundering equipment sold in other parts of the world.

## 4. Rationale for Use of Reference Detergents in Laboratory Testing

4.1 Many fabric attributes critical to consumer use and acceptability, such as dimensional change, surface or smoothness appearance, colorfastness, soil release, and flammability resistance performance are influenced by the manner in which textile products are laundered. The textile industry has adopted standard detergents and laundering conditions to allow for the prediction of the acceptability of textile prod-

[1] Absorption of fluorescent whitener on a textile material changes its visual appearance and consequently interferes with the evaluation of color change and/or staining.

ucts to judge the performance of their products. The standard detergents have been designed to represent a cross section of market detergents.

4.2 The use of locally purchased national brands of detergents in testing labs is a fairly common practice. This practice has been driven by several factors: a) care labeling considerations, b) inaccurate assumption that the same detergent brand has the same composition from location to location and from one year to the next one, c) the convenience of buying locally, and d) price. The use of "off the shelf" detergents in laboratory testing adds an element of variability that use of standard test methods and detergents intends to control. The percentage of optical brightener or fluorescent brightener agents has a definite effect on colorfastness evaluations. The amount of optical brightener or fluorescent brightening agents is known to vary within a single brand of detergent sold for consumer use.

4.3 Detergent producers have developed detergents with other cleaning components such as non-chlorine color safe bleach systems. AATCC now has full-scale (washing machine) methods and accelerated standard procedure for determination of colorfastness using such products. They are AATCC Method 172, Colorfastness to Non-Chlorine Bleach in Home Laundering, and AATCC Method 190, Colorfastness to Home Laundering with Activated Oxygen Bleach Detergent: Accelerated.

4.4 It should be noted that different standard laundering equipment and detergents are used in Europe and Asia.