

stick) and, thus, the enhanced duration effect is not limited to product form.

The agency has determined that the data support a claim of enhanced duration for 24 hours according to the Panel's criteria. The protocols in seven of the studies (Refs. 7 and 10) varied only slightly from the Panel's recommended protocol. Subjects in one study abstained from antiperspirant use for 2 weeks prior to the study. Subjects in the other six studies stopped using antiperspirants 4 weeks prior to the studies. The subjects were pretreated with an antiperspirant for the 5 days prior to beginning sweat collection procedures. Sweat was collected 4 and 24 hours following the last antiperspirant application. Five studies included untreated axilla controls, and two studies included placebo controls. One product was tested in two different studies (one with a placebo and one without), and the results were virtually identical. The tests supported enhanced duration efficacy of 20 percent sweat reduction over the 24-hour period for aluminum zirconium tetrachloride (15.5 percent roll-on and 18.2 percent stick), zirconium tetrachloride (20 percent roll-on), aluminum chlorohydrate (6.8 percent aerosol), and aluminum chloride (20 percent solution).

Other data (Ref. 4) also supported enhanced duration of effectiveness for antiperspirant solid sticks containing 10 and 25 percent aluminum chlorohydrate. Subjects, who abstained from antiperspirant use for 17 days prior to the study, were pretreated with an antiperspirant for the 3 days prior to sweat collection, 1 and 24 hours after the last antiperspirant application. Standard hotroom and sweat collection procedures were used. Over the 24-hour period, both 10 percent and 25 percent aluminum chlorohydrate sticks reduced sweat production in the treated axilla by 20 percent compared to the untreated axilla. The 25-percent aluminum chlorohydrate product also showed a 30-percent reduction in sweat production.

Six other studies (Ref. 11) support enhanced duration claims. Most products showed a 20-percent reduction in sweat production compared to an untreated axilla for both the 4- and 24-hour evaluation periods, with several products showing a 30-percent sweat reduction. However, the studies did not identify the antiperspirant active ingredients.

The agency is including the following enhanced duration claims in § 350.50(b)(3) of this final monograph: "all day protection," "lasts all day," "lasts 24 hours," or "24 hour protection." In order to make such a

claim, an antiperspirant product must reduce sweat production by at least 20 percent over a 24-hour period after application using the guidelines for effectiveness testing referred to in § 350.60. Antiperspirant products that meet the extra effective criteria (see section II.C, comment 11 of this document) over a 24-hour period can be labeled with both extra effective and enhanced duration claims (e.g., "24 hour extra effective protection," "all day extra effective protection," "extra effective protection lasts all day," etc.). Claims of enhanced duration for more than 24 hours are nonmonograph because the agency has not received any data to demonstrate antiperspirant effectiveness for more than 24 hours according to the Panel's criteria.

(Comment 13) Several comments objected to the Panel's Category III classification of claims for control of emotional sweating, e.g., induced by tension or stress (43 FR 46694 at 46728). The comments contended that a product's antiperspirant activity is the same whether the sweat is due to thermal conditions or emotional factors. Some comments disagreed with the need for additional testing, especially consumer perception testing, to establish these claims. One comment requested a hearing.

One comment submitted clinical data (Refs. 7 and 12) which it contended showed: (1) There is a valid scientific protocol that combines a gravimetric sweat test with a word-quiz stress test to measure reduction in emotionally-induced sweat; (2) an antiperspirant is not washed from the axillae during controlled emotional stressing, and excessive sweat does not diminish antiperspirant effectiveness; (3) an antiperspirant effective in reducing thermally-induced sweat is effective in reducing emotionally-induced sweat also; and (4) an antiperspirant that reduces emotionally-induced sweat by 20 percent or more meets the standard for antiperspirant effectiveness for which user perception and benefit has already been accepted and, thus, there is no need for additional user perception testing. The studies included aerosol, roll-on, and stick products containing aluminum chlorohydrate or aluminum zirconium tetrachlorohydrate, the major antiperspirant active ingredients.

The agency has determined that gravimetric sweat tests combined with mental stress tests support an emotionally-induced sweating claim. The data included 12 studies with the same design of 5 days each on panels of approximately 25 female subjects: Pretest-abstention from all

antiperspirants for at least 4 weeks prior to the study; day one—pretreatment control sweat collection under no stress; day two—pretreatment control sweat collection under emotional stressing; days two through five—apply test product; and days four and five—posttreatment sweat collection under emotional stressing. Subjects applied the antiperspirant test formulation to one axilla and used either a comparative formulation, a control placebo formulation, or no treatment on the opposite axilla. A control emotional challenge test, which lasted for about 60 minutes, was done on day two and an emotional challenge test was done on days four and five of the study.

Emotional sweating was induced by having subjects do a word definition test conducted by a moderator experienced at insuring optimum stress. The subjects received monetary rewards for a correct definition, but forfeited some of their rewards for incorrect or untimely definitions. Subjects had a 5-second time limit to begin a response and a 15-second maximum time to give the actual word definition. After 60 minutes, sweat was measured gravimetrically from the preweighed absorbent pads. Standard sweat collection and statistical evaluation procedures were used. The median sweat output for the 12 studies was 1,257 milligrams (mg) for the pretreatment control under emotional stressing compared to 415 mg for the pretreatment control under no stress. This word definition test effectively elicited a sweat response.

In the 12 studies using the word definition test, there was at least a 20-percent reduction of sweat production. The top 10 percent of heavy sweaters from each study (25 subjects) having the highest sweating rates on the untreated axilla had a 36.8 percent average sweat reduction compared to 38.2 percent reduction in the remaining 90 percent of each population (196 subjects), showing no significant difference in effectiveness in the two groups. Majors and Wild (Ref. 13) obtained similar results when comparing individual percent reduction in thermal sweating in the antiperspirant-treated axilla to rate of sweating from the untreated axilla in 89 subjects. They found that heavy sweating did not affect the rate of reduction.

The products tested under the emotional sweat protocol were also evaluated under a standard thermal sweat protocol at 100 °F with 30 percent relative humidity. The average percent sweat reduction for aerosols was 37.0 percent for emotional sweating and 34.0 percent for thermal sweating, for sticks it was 46.0 percent for emotional