



Designation: E 1490 – 92 (Reapproved 1997)

Standard Practice for Descriptive Skinfeel Analysis of Creams and Lotions¹

This standard is issued under the fixed designation E 1490; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 The objective of this practice is to provide procedures that may be used in the design and analysis of studies of skin care products that compare qualitatively and quantitatively various sensory attributes and their intensity (or strength) over time. These properties can then be used to define the performance of skin care products to provide direction in product formulation, research guidance, and claim substantiation.

1.2 Guidelines are provided for the definition of each product attribute or term, range of the rating scales, procedures for the manipulation of product alone and on the skin, selection and training of panelists, handling of products, and skin conditioning prior to tests.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 253 Terminology Relating to Sensory Evaluation of Materials and Products²

3. Terminology

3.1 *Definitions*—Definitions of descriptive terms other than those given as follows appear in the procedure of Appendix X1.

3.1.1 *afterfeel*—the feel of the skin after application of the sample, with or without touching, usually measured at a set time interval.

3.1.2 *delivery*—the stage during which the product is discharged onto the finger(s) or skin.

3.1.3 *greasy*—a somewhat thick, sticky, either slightly resistant or slightly slippery film (for example, petrolatum).

3.1.4 *oily*—a thin, slippery, non-sticky film (for example, mineral oil).

3.1.5 *panel leader*—a person who is responsible for conducting descriptive panels and control product, protocols, and panel maintenance.

3.1.6 *pick-up*—the stage during which the product is manipulated between the fingers.

3.1.7 *reference anchors*—products that are used to demonstrate high or low intensities of a particular attribute.

3.1.8 *rub-out*—the stage during which the product is rubbed onto the skin.

3.1.9 *waxy*—a rigid, dry, somewhat resistant residue.

4. Summary of Practice

4.1 This practice provides for the identification of panelists selected and trained appropriately to evaluate the intensity and duration of defined sensory characteristics of skin care products. The details of specified procedures are defined in Sections 7 and 8 of this practice.

5. Significance and Use

5.1 The procedure recommended in this practice can be used to assess the sensory appearance and tactile properties of lotions and creams or ointment.

5.2 This practice is applicable to product categories that include skin lotions and creams; facial moisturizers; hand lotions and creams; and skin care products for which the appearance and tactile properties need to be assessed.

5.3 Procedures of the type described herein may be used to communicate perceived sensory properties (appearance and feel) between manufacturers and to the consumer through the media. These guidelines are suggested to meet the need for ascertaining the performance of experimental or commercial samples.

5.4 These procedures are to be used by persons who have familiarized themselves with the procedures and have had previous experience with sensory evaluation.

5.5 This practice provides suggested procedures and is not meant to exclude alternate procedures that may be effective in providing sensory evaluation descriptions.

6. Equipment

6.1 The following equipment may be used during the evaluation process.

6.1.1 *Template*, used to outline the 2-in. (51-mm) diameter

¹ This practice is under the jurisdiction of ASTM Committee E-18 on Sensory Evaluation of Materials and Products and is the direct responsibility of Subcommittee E 18.07 on Personal Care and Household Evaluation.

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² *Annual Book of ASTM Standards*, Vol. 15.07.

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circles on the forearm. It assures that consistent, measured areas are delineated for product application and evaluation (for example, a flexible plastic material with 2-in. (51-mm) diameter circles cut out for outlining with an appropriate marker).

6.1.2 *Light Source/Viewing Conditions*—A consistent light source for each panelist is recommended for use during the evaluation of shine. The type of light source will depend on the specific nature of the product being evaluated. It is important that all panelists receive the same amount of light on the arms and the same angle of light, and that the distance from the test site and light be the same for each panelist (for example, high-intensity desk lamps).

6.1.3 *Skin Thermometer*.³

6.1.4 *Repeater Pipette*.

6.1.5 *Metronome*.

6.1.6 *Stopwatch*.

6.1.7 *Syringe*.

6.1.8 *Petri Dishes*.

6.1.9 *Weight Boats*.

6.1.10 *Hygrometer*.

7. Panel Selection and Training

7.1 *Objective*—To select and train a panel of 10 to 15 judges to evaluate the skinfeel properties (included in appearance, pick-up, rub-out, and afterfeel stages) of lotions and creams using a descriptive analysis method that quantifies several sensory attributes over time.

7.2 Panel Section:

7.2.1 Panelists are recruited from within a company or the local community. The choice to use employees allows a company to have the panelists on site and to keep proprietary samples and information on site. The use of local community residents allows a company to schedule more panel time per week and provides a smaller risk to losing panelists both on a daily basis and long term.

7.2.2 A large group of candidates are recruited from the local community (50 to 75) by contacting community groups or placing newspaper ads, or both. Candidates from within the company are contacted by interoffice memo or notices posted on bulletin boards. Prior to the prescreening questionnaire, candidates should be informed of the time commitment for training (orientation and practice sessions), the potential duration of the panel, the use of the panel, and the expectation of each panelist in terms of commitment to the panel. The prescreening questionnaire is recommended for determining availability, interest, general knowledge of tactile properties, ability to use descriptive words, and ability to use rating scales (see Figs. 1-3).

7.2.3 The 20 to 30 candidates who score best on the prescreening questionnaire (see 7.2.5 for criteria) participate in the acuity screening phase (see Figs. 4 and 5). Candidates are asked to rate the intensity of skinfeel attributes for three samples chosen specifically to represent the range for the attributes tested. One attribute is chosen from each evaluation

³ Two telethermometers that would satisfy the guidelines identified in this practice are Telethermometer Model 44TA, marketed by YSI (Yellow Springs Instrument Company, Inc.), Yellow Springs, OH, or Digital Thermometer Model No. 5650 from Markson Science, Inc., Del Mar, CA.

SCREENING QUESTIONNAIRE

NAME _____ PHONE NO. _____
ADDRESS _____ (city/state) (zip code)
TIME _____

1. ARE YOU CURRENTLY EMPLOYED OUTSIDE THE HOME? _____
IF YES, WHAT HOURS AND DAYS DO YOU WORK _____

2. ARE THERE ANY WEEKDAYS, MONDAY THROUGH FRIDAY, THAT YOU WILL NOT BE AVAILABLE ON A REGULAR BASIS? _____
IF YES, WHAT HOURS AND DAYS ARE COMMITTED? _____

3. DO YOU HAVE YOUR OWN MEANS OF TRANSPORTATION? _____

HEALTH

1. HAVE YOU EVER HAD AN ALLERGIC OR ADVERSE REACTION TO ANY LOTION, FRAGRANCE OR CREAM? IF YES, DESCRIBE _____

2. DO YOU HAVE ANY OF THE FOLLOWING?

	YES	NO
PSORIASIS	()	()
ECZEMA	()	()
CENTRAL NERVOUS SYSTEM DISORDER	()	()
UNUSUALLY COLD OR WARM HANDS	()	()
SKIN RASHES	()	()
CALLUSES ON HANDS/FINGERS	()	()
HYPERSENSITIVE SKIN	()	()
TINGLING IN THE FINGERS	()	()

3. ARE YOU CURRENTLY TAKING ANY MEDICATION? PLEASE LIST _____

GENERAL

1. DOES ANYONE IN YOUR IMMEDIATE FAMILY WORK FOR A CONSUMER PRODUCT COMPANY? _____

2. DOES ANYONE IN YOUR IMMEDIATE FAMILY WORK FOR A PERSONAL CARE COMPANY? _____

3. DOES ANYONE IN YOUR IMMEDIATE FAMILY OR SOMEONE YOU KNOW WELL WORK FOR A MARKETING RESEARCH OR ADVERTISING FIRM? _____

FIG. 1 Screening Questionnaire

TOUCH QUIZ

PLEASE ANSWER EACH QUESTION IN YOUR OWN WORDS

1. WHAT TACTILE CHARACTERISTICS OF A LOTION WOULD MAKE YOU THINK IT IS RICH? _____

2. WHAT IS THICKER, AN OILY OR GREASY FILM? _____

3. WHEN YOU RUB AN OILY FILM ON YOUR SKIN, HOW DO YOUR FINGERS MOVE? SLIP _____ OR DRAG _____ (CHECK ONE)

4. WHAT PROPERTIES MAKE A TISSUE FEEL SOFT? _____

5. HOW MIGHT THE APPEARANCE OF A HAND CREME INFLUENCE YOUR PERCEPTION OF THE FEEL OF IT? _____

6. NAME SOME THINGS THAT ARE STICKY? _____

7. WHEN YOUR SKIN FEELS MOIST, WHAT OTHER WORDS OR PROPERTIES COULD DESCRIBE IT? _____

8. NAME SOME THINGS THAT ARE ROUGH _____ WHAT MAKES THEM ROUGH? _____

9. BRIEFLY, HOW WOULD YOU DEFINE ABSORBENT IN A LOTION? _____

10. WHAT PROPERTIES MAKE A DEODORANT FEEL STICKY? _____

FIG. 2 Touch Quiz

category: appearance (for example, integrity of shape), pick-up (for example, firmness or stickiness), rub-out (for example, ease to spread or whitening), and afterfeel (for example, greasiness or amount of residue). For rub-out in a lotion

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SCALING EXERCISE

INSTRUCTIONS: LOOK AT THE FIGURE ON THE LEFT. DETERMINE THE AMOUNT THAT IS SHADED. PLACE A MARK ON THE SCALE AT THE RIGHT TO INDICATE THE PROPORTION OF THE AREA THAT IS SHADED.

EXAMPLE:

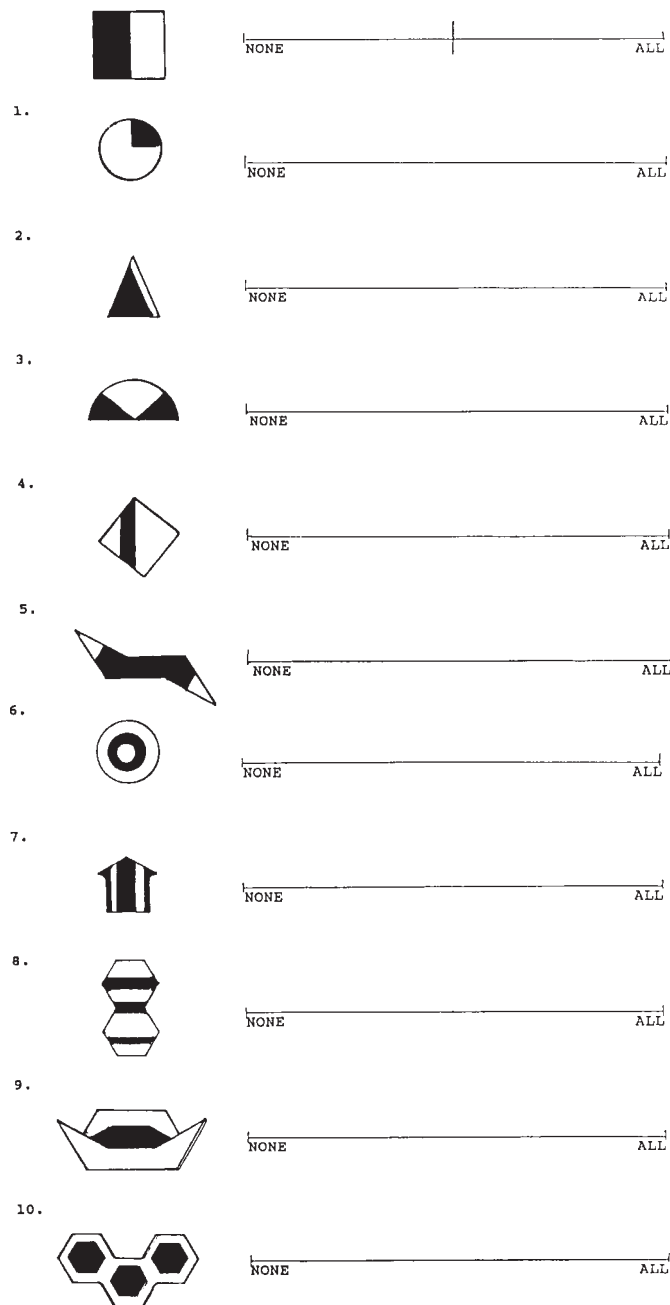


FIG. 3 Scaling Exercise

I. RATING EXERCISE

Sample Code

Ballot

Name Date

Directions:

- Place 1 drop of product _____ on forefinger tip of right hand.
- Compress that drop GENTLY between the forefinger and thumb.
- Estimate the AMOUNT of each attribute AS COMPARED TO MOST HAND LOTIONS.

THICKNESS: Force to compress

NONE EXTREME

PEAKING: Amount that the sample peaks (when fingers are pulled apart)

NONE EXTREME

WETNESS: Amount of wet/watery feel to the product during compression or rotation of fingers

NONE EXTREME

FIG. 4 Rating Exercise

II. DESCRIPTIVE EXERCISE

Sample Code

Ballot

Name Date

Directions:

- Place 1 drop of sample _____ on the back of your _____ hand.
- Rub sample with index finger GENTLY in a CIRCULAR MOTION.
- Describe what it feels like as you rub it.

After the product is rubbed into your skin, wipe off your fingers only with a towelette. Do not touch product on back of your hand.

Dry fingers with tissue.

Feel the back of your _____ hand now and describe the way your skin feels.

FIG. 5 Descriptive Exercise

attributes, the three test products are applied in premeasured amounts to three 2-in. (51-mm) circles on each arm. Use one arm for the rub-out evaluation and the other arm for the afterfeel attribute.

7.2.3.1 Candidates should have at least two products (of the three tested) rated properly for three of the four attributes in order to qualify as having sensory acuity.

7.2.4 Each candidate is interviewed by the panel administrator or trainer to determine attitude, interest, ability to learn

and work in a group dynamics situation, and availability for orientation, practice, and panel sessions on a routine basis (see Fig. 6).

7.2.5 Select 10 to 15 panelists on the basis of the following criteria (see Figs. 7-12):

7.2.5.1 Availability for the complete orientation and test to



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INTERVIEW QUESTIONNAIRE

Name _____ Date _____

1. Are you comfortable working in a group situation?

2. How do you feel about voicing your opinion?

3. How do you feel about opinionated people?

4. How do you feel about committing your time to a training program?

5. Are you interested in being a panelist?

6. Do you have any questions for me?

Comments _____

Accepted: YES NO

FIG. 6 Interview Questionnaire

SCREENING QUESTIONNAIRE

NAME _____ KEY _____ PHONE NO. _____

ADDRESS _____ (city/state) (zip code)

TIME

- ARE YOU CURRENTLY EMPLOYED OUTSIDE THE HOME? *check for conflict*
IF YES, WHAT HOURS AND DAYS DO YOU WORK *check for conflict*
- ARE THERE ANY WEEKDAYS, MONDAY THROUGH FRIDAY, THAT YOU WILL NOT BE AVAILABLE ON A REGULAR BASIS? *check for conflict*
IF YES, WHAT HOURS AND DAYS ARE COMMITTED? *check for conflict*
- DO YOU HAVE YOUR OWN MEANS OF TRANSPORTATION?
check for potential problem

HEALTH

- HAVE YOU EVER HAD AN ALLERGIC OR ADVERSE REACTION TO ANY LOTION, FRAGRANCE OR CREAM? IF YES, DESCRIBE

check for severe reactions

- DO YOU HAVE ANY OF THE FOLLOWING?

	YES	NO
PSORIASIS	()	(X)
ECZEMA	()	(X)
CENTRAL NERVOUS SYSTEM DISORDER	()	(X)
UNUSUALLY COLD OR WARM HANDS	()	(X)
SKIN RASHES	()	(X)
CALLUSES ON HANDS/FINGERS	()	(X)
HYPERSENSITIVE SKIN	()	(X)
TINGLING IN THE FINGERS	()	(X)

- ARE YOU CURRENTLY TAKING ANY MEDICATION?
PLEASE LIST *check for medications that may affect the senses*

GENERAL

- DOES ANYONE IN YOUR IMMEDIATE FAMILY WORK FOR A CONSUMER PRODUCT COMPANY? *no*
- DOES ANYONE IN YOUR IMMEDIATE FAMILY WORK FOR A PERSONAL CARE COMPANY? *no*
- DOES ANYONE IN YOUR IMMEDIATE FAMILY OR SOMEONE YOU KNOW WELL WORK FOR A MARKETING RESEARCH OR ADVERTISING FIRM? *no*

FIG. 7 Key for Screening Questionnaire (Fig. 1)

100 % of the practice sessions during training;

7.2.5.2 No health-related problems: skin irritations, central nervous system disorders, or medications that interfere with the

TOUCH QUIZ

PLEASE ANSWER EACH QUESTION IN YOUR OWN WORDS

- WHAT TACTILE CHARACTERISTICS OF A LOTION WOULD MAKE YOU THINK IT IS RICH?
thick, viscous, creamy, firm, smooth
- WHAT IS THICKER, AN OILY OR GREASY FILM? *greasy film*
- WHEN YOU RUB AN OILY FILM ON YOUR SKIN, HOW DO YOU FINGERS MOVE? SLIP X OR DRAG (CHECK ONE)
- WHAT PROPERTIES MAKE A TISSUE FEEL SOFT? *not stiff, pliable, smooth, fuzzy, thick*
- HOW MIGHT THE APPEARANCE OF A HAND CREME INFLUENCE YOUR PERCEPTION OF THE FEEL OF IT? *thicker lotion = richer, moisturizing, thinner lotion = oily*
- NAME SOME THINGS THAT ARE STICKY? *honey, jelly, syrup, Vaseline*
- WHEN YOUR SKIN FEELS MOIST, WHAT OTHER WORDS OR PROPERTIES COULD DESCRIBE IT? *dewy, wet, oily, sweaty, clammy, greasy, moisturized*
- NAME SOME THINGS THAT ARE ROUGH? *concrete, emery board, toast*
WHAT MAKES THEM ROUGH? *particles, stiffness, dryness*
- BRIEFLY, HOW WOULD YOU DEFINE ABSORBENT IN A LOTION? *An absorbent lotion is not greasy or oily and goes into the skin quickly*
- WHAT PROPERTIES MAKE A DEODORANT FEEL STICKY? *sticks to the skin/fingers, too wet, too thick*

FIG. 8 Key for Touch Quiz (Fig. 2)

I. RATING EXERCISE

Sample

Code

The answers for the acuity tests depend on the samples chosen.

Ballot

Name _____ Date _____

Directions:

- Place 1 drop of product _____ on forefinger tip of right hand.
- Compress that drop GENTLY between the forefinger and thumb.
- Estimate the AMOUNT of each attribute AS COMPARED TO MOST HAND LOTIONS.

THICKNESS: Force to compress

NONE

EXTREME

PEAKING: Amount that the sample peaks (when fingers are pulled apart)

NONE

EXTREME

WETNESS: Amount of wet/watery feel to the product during compression or rotation of fingers

NONE

EXTREME

FIG. 9 Key for Rating Exercise (Fig. 4)

central nervous system and could reduce skin and muscle sensitivity;

7.2.5.3 Correct and comprehensive descriptive answers to 75 % or more of the open-ended tactile questions in the prescreening questionnaire;

7.2.5.4 Correct ratings of 80 % or more of the ratings



Documents

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II. DESCRIPTIVE EXERCISE

Sample

Code

The answers for the acuity tests depend on the samples chosen.

Ballot

Name _____ Date _____

Directions:

- o Place 1 drop of sample _____ on the back of your _____ hand.
- o Rub sample with index finger GENTLY in a CIRCULAR MOTION.
- o Describe what it feels like as you rub it.

- o After the product is rubbed into your skin, wipe off your fingers only with a towielette. Do not touch product on back of your hand.

- o Dry fingers with tissue.

- o Feel the back of your _____ hand now and describe the way your skin feels.

FIG. 10 Key for Descriptive Exercise (Fig. 5)

INTERVIEW QUESTIONNAIRE

Name _____ Date _____

1. Are you comfortable working in a group situation?

yes, I think so

2. How do you feel about voicing your opinion?

I am comfortable with voicing my opinion, I have no problem

3. How do you feel about opinionated people?

They do not bother me

4. How do you feel about committing your time to a training program?

It does not bother me, I am flexible

5. Are you interested in being a panelist?

yes

6. Do you have any questions for me?

Comments _____

Accepted: YES NO

FIG. 11 Key for Interview Questionnaire (Fig. 6)

exercise in the prescreening questionnaire;

7.2.5.5 Correct ratings for two samples (of the three per attribute) for three of the four attribute scales; and

7.2.5.6 Demonstration of good verbal skills, a high interest in descriptive and group dynamics tasks, and a cooperative yet confident personality demonstrated in the interview.

SCALING EXERCISE

INSTRUCTIONS: LOOK AT THE FIGURE ON THE LEFT. DETERMINE THE AMOUNT THAT IS SHADED. PLACE A MARK ON THE SCALE AT THE RIGHT TO INDICATE THE PROPORTION OF THE AREA THAT IS SHADED.

EXAMPLE:

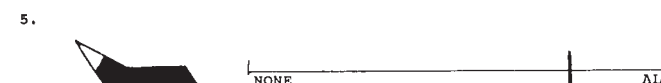


FIG. 12 Key for Scaling Exercise (Fig. 3)

7.3 Panel Orientation:

7.3.1 To begin training of the 10 to 15 selected panelists, the panel trainer must orient panelists first to the general concepts, such as the definition, components, and applications of descriptive analysis testing. This takes 1 to 2 h.

7.3.2 Panelists are introduced to the need for strictly controlled procedures for the manipulation and application of samples and for the careful definition of each sensory attribute. This takes 1 to 2 h. (See Appendix X1 for procedures.)



7.3.3 Discussion and demonstration of each skinfeel attribute are conducted for each stage: appearance, pick-up, rub-out, and afterfeel. This establishes the overall structure of the descriptive analysis of skinfeel properties. Panelists are encouraged to discuss each term, its definition, the protocol for evaluation, and the corresponding rating scale after they are demonstrated by the panel trainer. This takes 2 h (see Appendix X1).

7.3.4 For each skinfeel attribute, the procedure, definition, and scale are discussed and demonstrated using three to five references (if possible) that represent the full intensity range from none or extremely low to very high. This exercise takes 4 to 5 h. (See Appendix X1 for high and low references for each attribute.)

7.4 Panel Practice:

7.4.1 Several practice sessions totaling 20 to 24 h are held to review the orientation material. These include the following:

7.4.1.1 Review of the procedure, definition, and rating scale for each attribute (approximately 10 to 12 h); and

7.4.1.2 Evaluation of one or two products; these are evaluated independently with the scale references, as needed (approximately 10 to 12 h).

7.4.2 Five to six pairs of samples (the samples in the pair should initially be quite different from each other) are evaluated on all attributes for all four stages: appearance, pick-up, rub-out, and afterfeel during the practice sessions (approximately 10 to 12 h).

7.5 *Validation*—Any one of the following methods can be used for panel validation.

7.5.1 Choose three different products from the same product category (lotions, creams, gels, mousses, etc.) that demonstrate significant differences on several attributes, as shown by an established panel. The panel results from the recently trained panel are compared to the results of the same samples from the established panel. The recently trained panel should provide similar results in 80 % of all attributes. This assumes 10 panelists in each panel.

7.5.2 Choose three different products from the same product category (lotions, creams, gels, mousses, etc.) that demonstrate significant differences on several attributes. The product evaluations of recently trained panels are compared to the results made by instruments that simulate the way products are applied to the skin. The results of the panelists are validated by the correlation of the two sets of results (panel and instrumental).

NOTE 1—A lack of correlation may be a function of a poor choice of instrumentation measurement to simulate sensory product application or manipulation, or both.

7.5.3 Choose panel data across three different products from the results of the recently trained panel. Compare these data with consumer attribute data for those attributes for which consumers have demonstrated understanding and an ability to differentiate among products. If the panel data correlates well with the previously validated consumer responses for similar attributes, the panel data can be considered valid.

NOTE 2—A lack of correlation may be a function of consumer terms that are not related to the panel attributes or that are not understood by the consumers.

7.6 *Panel Monitoring*—Three different factors can be moni-

tored when reviewing data from the panel and panelists.

7.6.1 A measure of the variability within the panel (that is, among panel members) can be determined with three replications of three samples for all attributes and all panelists. The mean value and standard deviation for each sample for each attribute is computed. The panelists and panel leader can then look at the mean value for each sample and attribute versus each panelist's score. This permits the panel leader to see whether one or more panelists are rating consistently higher or lower than the panel as a whole on one or more attributes. Review of the standard deviations across attributes demonstrates whether some panelists have standard deviations that are more variable than most panelists and on which attributes. Large panel standard deviations indicate the need for a review of definitions, evaluation procedures, or reference standards for the attribute in question.

7.6.2 A measure of the reproducibility of the panel as a whole can be monitored by analyzing three replications of the panel's evaluation of two or three samples of the same product type. An analysis of variance will determine whether the panel scores are the same for the same sample across the replicates. This analysis should be conducted for each attribute.

7.6.3 Analysis of the data collected from three replicates of two or three different samples (as used in 7.6.2) can provide information on judge-by-treatment interactions in the analysis of variance. A significant F value on any attribute indicates that one or more panelists are evaluating samples differently. Data for these attributes should be plotted to determine the panelists whose values are different from the panel as a whole.

7.6.4 After six months, repeat the procedure as outlined in 7.6.2.

7.7 *Skin Types*—Skin types, skin condition, and age should be considered when recruiting panelists for a skinfeel panel. This may be important because skin care products are frequently formulated to address the characteristics of a specific skin type, and panelists may generate varying product descriptions of particular attributes based on skin-type differences.

7.7.1 *Pore Density*—The pore density on forearms is fairly uniform and should not be a factor when using the volar forearm.

7.7.2 *Sweat Thresholds*—Temperature may cause differences from person to person if there are differences in sweat thresholds. This factor can be eliminated by conducting the evaluation in a temperature-controlled environment that is kept below sweat thresholds. (This threshold is used here to mean the temperature at which the level of sweating becomes noticeable. Some levels of sweating are not noticeable and can be ignored as part of normal water loss through the skin.)

8. Procedure (See Appendix X1)

8.1 *Sample Preconditioning*—Samples should be reconditioned prior to conducting the descriptive panel. Preconditioning consists of storing the samples in an area with similar temperature and humidity conditions (see 8.5) until the samples equilibrate to those conditions.

8.2 *Skin Preconditioning*—The panelists should not apply lotions, creams, or any topical products to the volar forearms for approximately 4 h prior to an evaluation session. The test sites may be reused within 4 h if the sites are cleaned and