International Perfume Standards Program

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The difficulties in assuring consistent quality of fragrance compounds worldwide are apparent to a company where all products are developed in one country (the United States for Avon) but marketed in many. We find that the fragrance oil quality control standards of the country in which the product was developed should be the target for purchases at all using markets locations worldwide. I will explore the chemical, botanical and governmental, reasons for the difficulty in olfactory duplication of fragrance compounds as produced in different countries.

The use of a trained evaluation group in one location can both assure worldwide olfactory fidelity and keep all manufacturing locations provided with a fresh local quality control standard. The marketing of fragrances by multinational corporations (MNC) presents some unique challenges. Anytime one is forced to change sources of raw ingredients, the aesthetic characteristics of the products are likely to be influenced. Obviously, the more complex the chemical constituents of the product, the more variability that can be expected when using alternate sources of raw materials. What then could be more complex than a fragrance compound?

Fragrance compound variability may be due to both aromatic chemicals and essential oils. For aromatic chemicals, we have to deal with alternate manufacturing processes and starting materials. As an example, geraniol may be isolated from citronella oil, produced by reduction of citral or synthesized from pinene via myrcene. Each method will produce slightly different impurities and hence slightly different olfactory characteristics. The same applies for the other common aroma chemicals such as terpineol and hydroxycitronellal. The list goes on and on.

Turning to natural materials, the problem becomes even more complex. The odor of a botanical material will vary based on geographical origin, climatological conditions and extraction processes. Florida orange oil is subtly different from California orange oil or Italian orange oil. Consider a fragrance compound containing upwards of 150 ingredients all subject to this kind of variability. The potential for olfactory variations is almost endless.

Why can we not use identical sources of raw materials on a worldwide basis? This would

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certainly reduce the potential for odor differences. There are two strong arguments against this apporach, one economic and the other legal. Citrus oils or common aroma chemicals such as hydroxycitronellal can generally be replaced by roughly equivalent materials from other geographical sources. (Resolving the problem of slight olfactory variations will be dealt with later.) Both the citrus oils and the common aroma chemicals are examples of low price items where it is not economical to add the transportation costs attendant upon shipping these materials around the world.

Many fragrance compound houses will purchase these types of items from competitors rather than incur the cost of importing from their own subsidiaries.

The importation of raw materials can also raise legal issues. Many Third World countries have erected prohibitive tariff barriers to prevent foreign competition with their own materials. In effect, patchouli cannot be imported into developing country if patchouli is cultivated within that country. This is true even if the imported material is of a grade not available in this particular country, thus resulting in unavoidable olfactory or color differences.

Finally, there are some materials where the source cannot be changed for both aesthetic and economic reasons. Bulgarian Rose comes to mind as an example although there are a myriad of others. The quality of this material simply cannot be duplicated from another source, for example, Turkey or Morocco. The material is so expensive that transportation cost does not add significantly to the dollar value of its use in a formulation. Hence, there is no significant argument for its replacement by a local source.

Once we admit the inevitability of odor deviation, how then can we minimize these on a worldwide basis? In most MNC today, there is a tendency to centralize only those functions which the corporation feels cannot be delegated to the foreign operating locations. Therefore, a foreign location would be responsible for its own manufacturing and distribution. Such companies would select their own sources of raw materials subject only to a review of those sources by some technical services unit attached to the corporate headquarters. In the case of fragrance compounds, acquisition of a local source merely requires the foreign location to determine which international manufacturing facility of the perfume house will be manufacturing for its location.

This, of course, affects the MNC's selection of fragrance houses with which it will do business. There is no incentive for a major international corporation to solicit submissions from a fragrance house which cannot economically deliver its creations to all current or proposed markets. The fragrance house must compound or reach a licensing arrangement with a competitor.

If the material will be manufactured in the United States and exported, the U.S. quality control standard can be used for comparison to each lot. If the compound will not be manufactured in the United States, a local standard will have to be developed.

Why a local standard? Why cannot the U.S. quality control standard be used and the quality assurance department merely insure that the deviation from U.S. material does not exceed a certain limit?

The answer to both questions is that quality control should be divorced as far as possible from a subjective fragrance evaluation. If an oil is analyzed for odor, color, refractive index, specific gravity and a gas chromatograph curve is run, only the odor evaluation and the interpretation of a GC curve requires a subjective evaluation. In the United States you can evaluate the odor of any incoming sample using a triangle test with your quality control standard. Outside the United States, you have to judge each incoming sample as to whether its deviation from the U.S. quality control standard is more or less than what is considered to be acceptable.

The use of a local standard based on perfume oil quality available locally can eliminate odor evaluation as a subjective process. The triangle test thus provides a straightforward method to determine whether two perfume oil samples are significantly different from one another. No judgement as to acceptable/unacceptable difference from U.S. standard is necessary. The oil is either similar or different. If different, it is unacceptable. For the above reasons, it is desireable to provide local quality control standards. How did we go about establishing a working procedure for its implementation?

United States Standards Program

Establishing a program for the United States only was relatively simple. We contact our fragrance suppliers once a year and request a 600 gram sample representative of the quality the vendor feels it will be supplying for the next twelve months. If we spread the requests out over the entire year, the burden of replacing Avon's 750-800 domestic standards at one time is reduced to a more workable 60-65 Standards per month. Thus each of our fragrance suppliers will receive standards requests periodically throughout the year rather than all at once.

All incoming samples are evaluated against

existing specifications. To be acceptable, the material must be of "standard," quality. That is, the sample of perfume oil must not merely be "commercially" acceptable but must be of such a quality that it may be used as a target for future submissions. It does occasionally occur that a perfume oil requested as a standard may be acceptable for use in a finished product but unacceptable as a standard. In such a case a new sample would be requested.

Once a sample is found acceptable as a standard, the perfume oil is repackaged into half-ounce amber glass bottles for distribution to all quality control facilities. Each bottle is labeled to indicate an Avon identification number, the supplier's trade name and number, the supplier's name and lot number and the month the standard was distributed. Standards are stored under an inert atmosphere at 4°C.

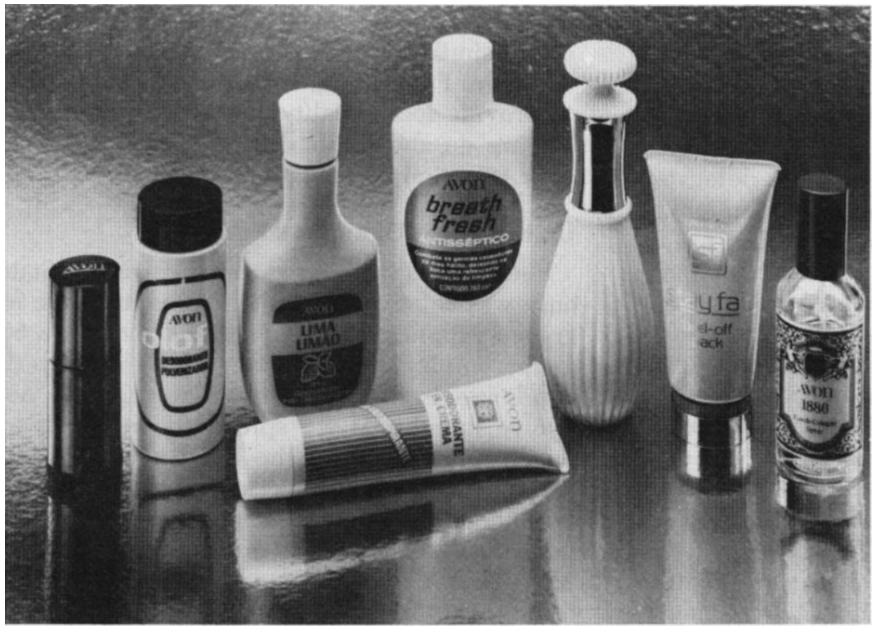
International Perfume Standards Program

Avon locations outside the United States also needed an effective system for the acquisition, evaluation and distribution of replacement perfume oil standards. Before we talk about replacement, however, we have to discuss the acquisition of the initial standard for which an annual replacement is desired. The target for all Avon purchases worldwide is the highest quality perfume oils. It is the responsibilty of the fragrance coordination department to insure that all fragrance oils either being purchased or considered for purchase, are technically compatible with the product bases in which they are used. Further, fragrance coordination is responsible for the issuance of specifications and standards for all perfume oils purchased by Avon.

Before a fragrance oil may be purchased at an Avon location outside the United States, the local representative of the fragrance vendor submits a sample of its perfume oil to the local Avon quality assurance department. That department, in turn, compares the oil to the quality control standard that is being used in the United States. If the local oil appears to be of satisfactory quality, it is submitted to fragrance coordination in the United States for final approval. This approval is known as "Nationalization."

Fragrance coordination reviews each oil submitted and either accepts or rejects it. If the oil is accepted, the overseas location is notified and quality control standards are prepared and distributed. If rejected, fragrance coordination contacts the submitting quality assurance department and request a rework. To facilitate the preparation of the reworked sample, fragrance coordination provides detailed olfactory comments so the local vendor will be able to readily determine what fragrance coordination sees as the olfactory deficiencies. The submission process is then repeated as often as is necessary to obtain an acceptable nationalization. This nationalization is the initial standard. All oils thus nationalized are replaced on an annual basis under this International Perfume Standards Program.

The International Perfume Standards Program was proposed to follow as closely as possible the procedures laid down in the domestic program.



Pictured are several of the Avon international products which are part of Avon's International Perfume Standards Program.

However, in order to obtain a viable working procedure internationally, certain alterations and adaptations of the domestic protocol proved to be necessary. Avon, for example, has more than fifteen locations which do their own quality control. Each Avon location (via their respective quality assurance departments) was informed of the proposed program. A formal written description of the program was distributed explaining in detail the procedures, guidelines and responsibilities of the International Perfume Standards Program.

Requests were then made to each international location for a list of all perfume oils with current purchasing activity. These lists included pertinent data about each active perfume oil: identification code, supplier and country of manufacture. As soon as those lists were received we realized the total scope of the program, approximately 2,400 oils.

Standards Replacements

The next step was to organize all this in such a way that we could develop a relatively simple procedure for standards replacement.

The compilation of the active perfume oil list received from Avon location was treated in a systematic, logical fashion. This included the use of on-line computer data entry, computer printouts and a formal distribution schedule. Each country, depending on the amount of active perfume oils used, was assigned months when perfume standards are scheduled for replacement. Data is entered on computer tape for each perfume oil in the program indicating the Avon identification number, vendor, vendor's identification number for the oil, vendor's manufacturing location, Avon's using location and month scheduled for replacement.

Computer lists are prepared from the data which can be sorted by any of the parameters on the tape. This enables us to determine, for instance, how many active perfume oils we have in Japan or how many oils a given supplier is manufacturing for us in Switzerland. A copy of the computer list goes to each quality assurance department indicating which month each perfume oil standard is to be replaced. In this way, the Avon locations involved are aware in advance what perfume standards will be ordered each month.

The question arose as to whom the requests for new replacement standards should be addressed. Should the samples be obtained through the U.S. representative of the fragrance vendor or from the local vendor representative in the using location? Because of the good communications between Avon and its overseas lo-

cations it was decided to have Avon's local quality assurance departments contact the local vendor representatives and request samples. Requests for replacement standards are sent to the Avon locations forty-five days prior to the assigned replacement month. The request is for 250 grams of fresh perfume oil from a production lot.

When the local vendor supplies to the quality assurance department samples of the perfume oil, it is forwarded to fragrance coordination for approval. If any requested perfume oils are no longer active at that Avon location, they will notify fragrance coordination so that oil can be deleted from the program. Thus, the program will only provide fresh standards for actively purchased fragrance oils.

Submissions Testings

The testing procedures establishing the acceptability of a perfume sample are similar to that for a domestic standard. The next submission is compared to the previous international standard and/or U.S. controls in a triangle test. This odor analysis is done by a group of trained odor evaluators.

Fragrance coordination does a minimum of physical testing. Different sources and import limitations of raw materials do not lend themselves to the 100 percent reproducibility of physical specifications. The acceptance or rejection of submissions by fragrance coordination, therefore, is based primarily on odor fidelity. Any necessary minor adjustment in physical specifications is left to the local quality assurance department.

All fragrance oils that differ in odor to an unacceptable degree from the U.S. control will be rejected. This odor evaluation was particularly important in the first year of the implementation of this program. We found that many oils which had been in use at various foreign locations for several years had drifted substantially from the original nationalized sample. It was found necessary, therefore, to re-nationalize these oils. These rejections were communicated by telex to the respective Avon location. Detailed comments were given to the location and rework was requested. When a fragrance oil had been found unacceptable two or more times, the U.S. supplier was contacted for assistance in resolving the problem.

Submissions deemed acceptable are distributed to all necessary locations/departments needing samples. Fragrance/flavor oil quality control standards are distributed in one-half ounce amber bottles for which refrigerated storage is strongly recommended. The bottle is labeled to include Avon identification number, vendor, vendor's identification number, lot number and month/year of issue and Avon location.

The distribution of approved standards is made to the local quality assurance department, vendor's local representative, vendor's U.S. representative, and corporate quality assurance (U.S.). In addition, retains are kept in fragrance coordination.

Accurate record keeping is a vital part of the International Perfume Standards Program. All evaluations done are sent by telex and copies are kept and filed by Avon location. An additional 3x5 index card file is kept. These cards are filed by numerical code order. Information listed on the cards consists of Avon identification number, Avon location, vendor and vendor's identification number. Each time a new sample of a particular perfume oil is evaluated, the date and detailed evaluation will be entered on the card.

Difficulties of Program Implementation

The implementation of such a program has not been without its problems, some anticipated and some unanticipated. During the first year, a substantial amount of time was devoted to overcoming these difficulties.

The problems encountered can be summarized as those of communication and workload.

In any MNC, communication is a key to the efficient running of a business. We are fortunate that most Avon locations received formal briefings on the procedures for the program from Avon's area quality control managers. The actual formal written communication implementing the program was couched in fairly general terms. This was done to allow the maximum flexibility in procedures to each using location. However, one practical effect was to raise large numbers of questions which proved difficult to answer without face to face communication. Ultimately, through good will on both sides and lots of teletype paper, the program was fully implemented.

In addition to communication difficulties, the increased workload required to manage the program proved to be larger than anticipated. The direct labor involved in testing all submissions and preparing standards added significantly to the workload of the section. Then too, the correspondence involved in handling 2,400 perfume oils was initially overwhelming. However, we were able to systematize our procedure to such an extent that the correspondence and most evaluations became part of the job routine. Only

the rejections required the detailed written evaluation that utilized an inordinate amount of time. Preparation of the quality control standards rapidly became almost an assembly line process.

Several locations overseas observed that the procedure we had set up to be uniform worldwide was not optimal for them because of unique local differences. For example, New Zealand draws its total requirement for perfume oil from Australia's inventory. Accordingly, rather than have New Zealand send samples for certification as perfume standards, they will routinely receive a sample of all of Australia's standards when issued.

Europe also posed a unique problem. It is the only location where we might purchase the same fragrance oil from more than one manufacturing location of the same vendor. For example, if a fragrance supplier has manufacturing facilities in the United Kingdom, the Netherlands, France and Spain, we might well have to establish local standards for each of these manufacturing facilities. Our United Kingdom and Spanish locations might be purchasing from facilities within their own borders, our German location from Holland and our Italian facility from France.

The solution to this problem was two-pronged. The effect was to minimize the total number of different standards needed. The first approach involved having a central location (in this case, in the United Kingdom) handle standards requests for multiple European manufacturing locations. At the same time, the purchasing group modified procedures so as to cease purchasing fragrance oils from more than one supplier manufacturing location whenever possible.

In summary, we determined that it was necessary to have a fresh fragrance oil quality control standard representative of the quality of oil available in any given overseas location. We recognize that ensuring worldwide quality required a central location to evaluate and approve the initial samples of oils before being purchased around the world. Once an initial quality was determined, it was necessary to assure that each location had access to a fresh quality control standard representing this quality. A procedure was then set up to assure annual replacement of quality control standards.

Acknowledgment

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