

Europeans build them differently Designing Nozzles to Fit the Market

ZVA Slimline automatic nozzles from ELAFLEX have a leading market position in Europe, larger parts of Africa and Asia and in Australia. But they are not sold in the US or Canada and are supplied only in smaller quantities to Central and South America. According to Underwriters Laboratories (UL), automatic nozzles must close with the flow. The ELAFLEX ZVA nozzle closes against the flow and so it does not meet the UL requirement. However, these nozzles have never caused a safety problem. In addition to the UL requirement, the market situation and the technical background in Europe differ significantly from the US. These factors have led to diverging concepts in the development and use of gasoline dispensing nozzles.



Small markets, many manufacturers

The US is unsurpassed in the number of cars, petrol stations, hoses and nozzles. Fifteen years ago, it was commonly estimated that the US had half of the world market for petrol pump hoses and nozzles. This does not seem realistic any more. It is difficult to get exact figures on the number of hoses and nozzles; however, I estimate that, today, Europe has around 70 percent as many hoses and nozzles as in the US.

The situation in Europe is characterized by small national markets with national oil companies, private owners and pump manufacturers. They have their own pump designs; they also have different legal requirements for the certification of systems and different philosophies on the proper way of dispensing. In most European countries, self-service was already going on to a large extent 15 years ago. Today—especially in Scandinavia—some of the oil companies already have unmanned stations (without any personnel or services).

The fragmentation of the European market naturally impacts the design and manufacture of petrol pump equipment. The suppliers are forced to offer special designs in small quantities. They are forced to quickly adapt to the varying wishes of their customers. The typical European manufacturer of pumps and dispensers only has a fraction of the equipment turnover of comparable US manufacturers, but you can be sure that they have to offer a plurality of pump and dispenser designs. On the nozzle, this diversification becomes apparent if you look at the number of different nozzle guards that must fit the various nozzle boots.

The system required for success in Europe can be described in two words: “modular system.” This does not only refer to the nozzle guards, but also to many other components. The swivels of the standard nozzles are part of the nozzle (differently for

vapor recovery nozzles) and are required with various threads: male and female British Standard Parallel thread and National (American) Standard Taper Pipe thread. There are requirements for different spouts, for leaded, unleaded and diesel. The diesel design can be supplied with an outer drip catcher and with an internal valve to keep the fuel from dripping out of the spout.

Internal parts like springs and seals have to be adapted to special applications. For nozzle switch devices in the nozzle boots, guards with custom-made magnets have to be supplied. Last but not least, there is a wide variety of colored covers that fit over the nozzle assembly for protection, as well as the various product badges available.

These badges are “snap-on” devices that can be used to display product identification. It can range from words such as “Diesel,” or any of a number of other messages, including a reminder to get an oil change. ELAFLEX supplies approximately 400 different designs of badges.

A European nozzle manufacturer has to face these various situations and offer nozzles in modular designs.

Repair systems

The complexity and the small size of the European markets also distinctly influence the repair systems available for nozzles. This really is a major difference when comparing the situation in Europe and the US. Repair systems The complexity and the small size of the European markets also distinctly influence the repair systems available for nozzles.

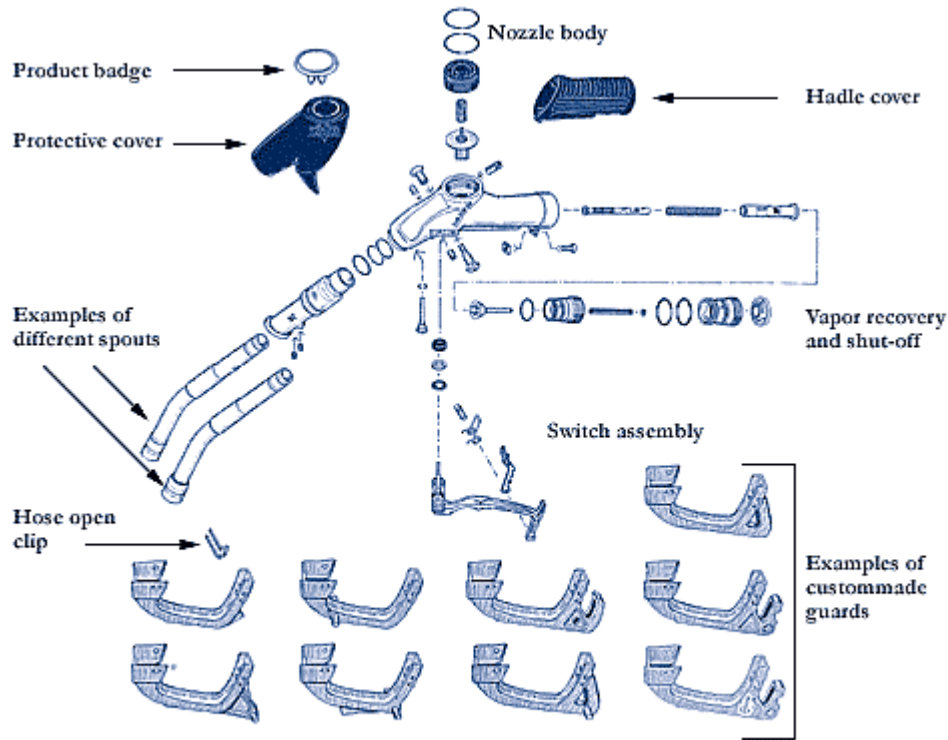
This really is a major difference when comparing the situation in Europe and the US. In the US there is hardly any repair of nozzles in the classical sense of

the word. Some of the nozzles supplied in the US are even made to be “non-repairable” or “throw-away-nozzles.” The repair system in the US traditionally relies on the “rebuilt” factories. Nozzles sent in are pulled apart. With the still-usable components, nozzles are assembled in serial-like production.

This system of rebuilding nozzles works perfectly for the US; however, due to the fragmentation of the European markets, it has not been successful in Europe. Actually, there is no company in Europe that could be described as a rebuilt company. The repairs are done by small repair companies that collect the nozzles in quantities of, say, 60 or 120. Those nozzles are repaired piece-by-piece, and the customer gets back the same nozzles he sent in. Maybe the evolution and further development of the petroleum industry in the European Community, as well as globalization, will lead to some changes. But, for the time being, our markets require nozzles that can be easily and quickly disassembled and reassembled and where each part can be replaced by an individual part, rather than a module.



It is doubtful whether the European market will accept modular nozzle technology that, in the event of a failure, would necessitate the replacement of an entire module instead of an individual part. Just to give an example: many of the existing nozzles have their automatic shut-off systems integrated into the spout of the nozzle. This proved to be an expensive matter when unleaded petrol made it necessary to change the spouts. The ZVA nozzle has been developed for the European repair philosophy. ZVA emphasizes the interchangeability of old and new parts.



**Example for the "Modular System":
ZVA 200 GR (Active Vapor Recovery)**

Other differences

There are a number of technical requirements which derive from the special circumstances of dispensing in Europe. The most important point has already been mentioned: In Europe we have had widespread self-service for many years. This made it necessary to develop a true "self service nozzle" that is customer-friendly and easy to handle. Such a nozzle must be light-weight and balanced, but robust, and provide "to-the-penny-dispensing."

The ZVA nozzle has been developed to meet these demands. The average service lifetime, with one or two routine repairs, is in the range of ten years. The method of closing against the flow has made it possible to have a soft and controlled closing of the nozzle and thereby to provide "to-the-penny-dispensing."

There have been long discussions in the US and Europe on the restriction of flow rates. In general one can say that Europe is more liberal on this point. There are restrictions only for nozzles with vapor recovery (42 l/m or about 11 gpm). The standard dispensing flow rate without vapor recovery is up to 80 l/m (about 21 gpm) for 1-inch nozzles. The manufacturers of nozzles should meet these flow rates.

This may not be so problematic for nozzles at new pumps and dispensers. But the story is different for old pumps that often do not provide the full flow rate. This should be considered in case of larger replacement actions—for instance, the retrofitting of the

stations with vapor recovery nozzles. In such cases, the pressure drop of all components used in the pump is critical and has to be evaluated.

One typical example of European variety is in the fill pipes of cars. In Europe, there are many small cars with small filler necks. Just this fact alone made the introduction of balance vapor recovery systems with rubber bellows practically impossible in Europe.

Non-European markets

The specifics described for Europe also apply to most of the other countries in the world. Because of the small size of their markets, they require special custom-designed nozzles. In many countries, the repair of nozzles is not executed by independent companies but by the user himself.

Especially in the Far East, there are still many oil companies with their own service and repair net. They are interested in robust, long-lasting nozzles to reduce the number of service calls and seem to have a repair mentality very similar to the Europeans.

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