



TRACER PRODUCTS

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TRACER WAFER™ FLUORESCENT LEAK DETECTION TECHNOLOGY FOR MOBILE AIR CONDITIONING SYSTEMS

U.S. Patents No. 5,440,919 and No. 5,650,563; Foreign Patents

The Tracer Wafer is composed of a small absorbent substrate of inert material, impregnated with a fluorescent leak detection dye. The wafer retains the dye until it is diluted and released by the fluids circulating in the air conditioning system. The *exact* location of *every* refrigerant leak will be pinpointed by its bright fluorescent green glow when the system is inspected with an ultraviolet or UV/blue light lamp. Tracer Wafers can be used for quality control on the production line as well as for warranty service and beyond.

Fluorescent leak detection is the most efficient and least time-consuming method to pinpoint refrigerant leaks. Many automotive manufacturers worldwide install Tracer Wafers into their A/C systems *on the assembly line*. The benefit of this practice is particularly significant in aftermarket service situations. Factory installation of the Tracer Wafer can drastically reduce the time spent searching for refrigerant leaks in the field, which drives down the cost of warranty claims billed to the manufacturer.

The assembly line application of fluorescent dye presents many potential problems. To be effective, an A/C leak detection dye must be invasive in nature and able to travel easily through the gaps and interstices of components, joints and fittings. The dye must also be apparent in very minute quantities to provide the required sensitivity as a leak detection material. This combination of properties, which is the main reason the fluorescent leak detection process works so well, presents a challenge to assembly line applications.

Injection of liquid dye into the completed A/C system or into a component of the system is too time-consuming to be practical for assembly line use. In addition, a small amount of the dye dripping onto the components or flowing from the injection area and spreading would lead to false leak indications on the completed product. Introducing the dye with the refrigerant could produce the same problems, compounded by the fact that the pressurized refrigerant can spray the fluorescent material over the surrounding area when connecting or disconnecting the charging apparatus.

The Tracer Wafer provides an ideal solution to the problem of introducing fluorescent refrigerant leak detection dyes into production line situations. The absorbent substrate retains the dye, nullifying its inherent pervasiveness, and the final wafer product can be processed as a solid. The wafer can be shaped into a profile that is convenient to handle and can be added automatically into a component of the A/C system. This minimizes the labor required to incorporate the dye into the final package. The wafer retains the dye until it is released via the refrigerant and lubricant flow to which it will be exposed when the final assembly is completed. Handling of the dye is minimized, no changes to the final assembly process are needed and false leak indications are avoided.

A prime location for the Tracer Wafer is inside the desiccant within the dryer, receiver or accumulator of an A/C system. The Tracer Wafer should be positioned so as to be exposed to as much refrigerant as possible. The volume occupied by the wafer is negligible. As the component containing the desiccant is produced separately from any other components, the wafer is held in place and there is

no opportunity for the dye to come into contact with any surface which, if contaminated with the dye, would be seen on the exterior as a false leak. Several desiccant bag and dryer manufacturers are now equipped to automatically include Tracer Wafer in their product.

The Tracer Wafer is presently being produced using absorbent synthetic felt. This is the same material used in the production of desiccant bags. Sufficient fluorescent dye is added to the wafers to treat the lubricant charge of the system in which they are being used. They can be supplied with any fluorescent refrigerant leak detection dye required.

The wafers are available in two types—the original lubricant/dye wafer (dye dissolved in lubricant) and the new dry-matrix wafer. Although both wafers are similar in their uses and applications, the dry-matrix wafer, which is smaller in size compared to the lubricant/dye wafer, has a distinct advantage. The "lubricant-free" configuration of the dry-matrix wafer offers *universal compatibility* with any air conditioning system, regardless of the refrigerant or lubricant used. This obviates the need to match the lubricant type of the host system during installation. Also, the dry-matrix wafer offers protection against the adverse effects of moisture on the system because it does not absorb moisture. Another significant advantage of the dry-matrix wafer, besides providing mess-free handling, is that it can be custom-designed to fit into any filter-dryer.

Following is one example of a Tracer Wafer application involving a mobile air conditioning system operating with R-134a refrigerant and 7.5 ounces (220 ml) of PAG-based lubricant:

Absorbent material: Polyester felt disk, 0.75" (19 mm), 0.315" (8 mm) thick

Fluorescent dye: 0.02 fluid ounces (0.59 ml) of PAG-based R-134a dye, green fluorescing

Other forms and shapes of fluorescent dyes can be custom designed for special OEM needs. These can be solid or semi-solid dyes such as pills, pellets, slurries, swatches containing dye, etc. Additional methods of introducing fluorescent dye into air conditioning systems for OEM assembly lines are also available. Contact our OEM Engineering Department for further assistance in selecting the product that is most appropriate for your particular application.

