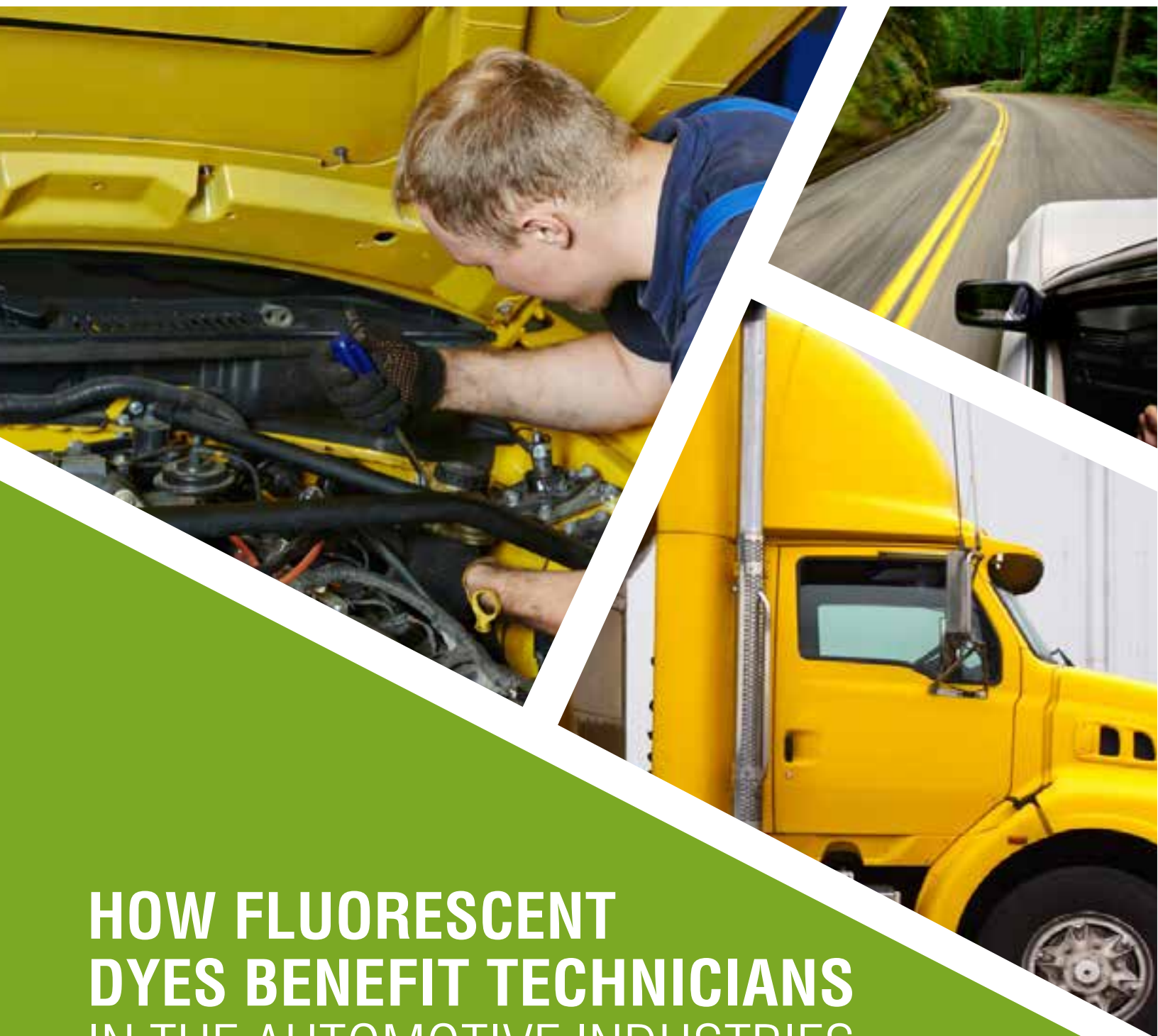




HOW FLUORESCENT DYES BENEFIT TECHNICIANS IN THE AUTOMOTIVE INDUSTRIES AND HEAVY DUTY/FLEET

WHITE PAPER

TRACERLINE[®]



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UV LEAK DETECTION

Does your go-to leak detection method make it difficult to find multiple and intermittent leaks?

How often have you been unable to find a leak until after it has resulted in an expensive system failure? Many technicians are in need of a more advanced solution.

So, what is UV leak detection?

It's a method in which a small amount of fluorescent dye is added into a system and allowed to circulate with the host fluid or refrigerant. The mixture then escapes and accumulates at all leak sites. By scanning the system with a leak detection lamp, all leaks will glow brilliantly, making them easy to spot.

Air Conditioning Dyes

Sooner or later, air conditioning systems are going to develop leaks. And even small leaks, if left undetected, will result in the loss of expensive refrigerant and possible damage to the A/C compressor and other components. Fluorescent dyes don't require an operating system, so long as dye was added prior to the refrigerant charge being lost.

Many car manufacturers are installing A/C systems with a Tracer Wafer™, an absorbent substrate of inert material saturated with a fluorescent dye which will allow for UV leak detection straight off the assembly line. To date, Tracer Wafers have been installed in over **250 million vehicles worldwide**, including hybrid cars. If a Tracer Wafer has not been installed, a liquid form of the dye is available in the aftermarket for all systems including hybrid and 1234yf.

A/C Dyes Should Be Co-solvent Free

Co-solvent based dyes can impair the properties of the A/C system's lubricant, resulting in diminished viscosity and lubricity. For example, dyes formulated with the co-solvent Aromatic 200 are detrimental to the operating parameters of oil due to its low viscosity. Another co-solvent often used by dye manufacturers is NMP or N-menthylpyrrolidone. This co-solvent is known to be harmful to aluminum, light metals, rubbers and plastic. Both Aromatic 200 and NMP are listed in the Pesticide Action Network (PAN) as Bad Actor Pesticides because of their reproductive or development toxicity or carcinogenicity. **By choosing a dye that is co-solvent free, any potential compatibility issues will be minimized.**

Nervous about voiding your equipment's warranty?

Some A/C dyes are approved by manufacturers, and can remain safely in automotive systems for their lifetime. It's about choosing the right dye for you. **Check the dye manufacturer's specifications for an OEM approval indication.**





Concentrated

Choosing a concentrated dye is cost efficient, as it minimizes the quantity of dye required to inject into a system.

**DYES
SHOULD
BE:**



OEM Approved

Choosing a dye that is OEM approved by automotive manufacturers will not void any vehicle warranties.

***Look for the label
before you buy!***

DYES FOR OTHER SYSTEMS

Coolant Dyes

The way today's cooling systems are designed, coolant leaks can be a tricky business to diagnose. There are basically two kinds of dyes on the market for coolant systems, universal and extended-life. Universal dyes will change the color of the antifreeze; extended-life dyes will not. For this reason, most technicians prefer extended-life dyes.

Oil-Based Dyes

Oil-based systems, such as lubrication, fuel, power steering and transmissions require an oil-based dye to find leaks. Universal dyes are more versatile and cost effective, but some customers may prefer a dye specific to a particular system.

PINPOINT THE EXACT SOURCE OF ALL THESE LEAKS:



AIR CONDITIONING



FUEL



COOLANT



AUTOMATIC
TRANSMISSION



ENGINE OIL



FLUID
HYDRAULICS



POWER STEERING
FLUID



WIND & WATER

ADVANTAGES OF FLUORESCENT LEAK DETECTION:



**Quickly finds the exact
source of each and
every leak**



**Conserves expensive
refrigerant and fluids**



**Very small, multiple, and
intermittent leaks are
easily found**



**A system can easily be
rechecked after repairs
are completed**



**Technicians can safely
search near moving parts**



**Ideal for preventative
maintenance and
diagnostics**



**VIOMAX PLUS™ TELESCOPIC TRUE
UV LEAK DETECTION LAMP**

HOW TO CHOOSE THE RIGHT LIGHT SOURCE

There are several factors to consider when choosing a light source. For instance, how much do you want to spend? Flashlights which emit blue light are typically more affordable. Do you want your flashlight to be battery operated or rechargeable? Many technicians would prefer to keep batteries

on hand than to remember to charge their lamp. Is a specialty lamp needed? For example, the VioMAX Plus™ (shown on p.6) is designed to view leaks in hidden and confined spaces. Lastly, **the most important decisions when choosing a lamp is deciding what type of light it will emit: True UV (Violet) or Blue.**



TRUE UV (VIOLET LIGHT)

- Works best with green dyes
- Yellow inspection glasses **not** needed in most situations
- Less visible light



BLUE LIGHT

- **Must** wear yellow inspection glasses
- Works best with **both** green and yellow dyes
- Budget friendly



COMMON MISCONCEPTIONS

Direct sunlight may make it difficult to see the glow of the fluorescent dye.

SOLUTION: Inspect for leaks early or late in the day, or shade the suspected area.

Line of site doesn't always allow for proper inspection.

SOLUTION: Light can be bounced off an inspection mirror to view difficult areas.

Also, flexible shaft UV inspection lamps are available for such circumstances.

Systems must be operational in order to circulate dye.

SOLUTION: Dye should be added and circulated before a problem exists. A system does not have to be functioning in order to find the leak.

There is a time delay after adding dye into systems before inspection can be performed.

SOLUTION: Dye can be added to a vehicle before a problem presents itself. It will then be fully circulated and the system will be ready to inspect when needed.

If another automotive technician is used to service a vehicle's A/C system, they won't know I've put dye in the system.

SOLUTION: Tamper-evident straps (shown in photo on page 8) are a good way to alert other technicians of the addition of dye. These straps can also be placed on the system to warranty your work and guard against unqualified repairs. Tamper-evident sleeves are another way to indicate when dye was injected. Doing this will also safeguard recovery equipment and ensure customer loyalty.



TAMPER-EVIDENT STRAP

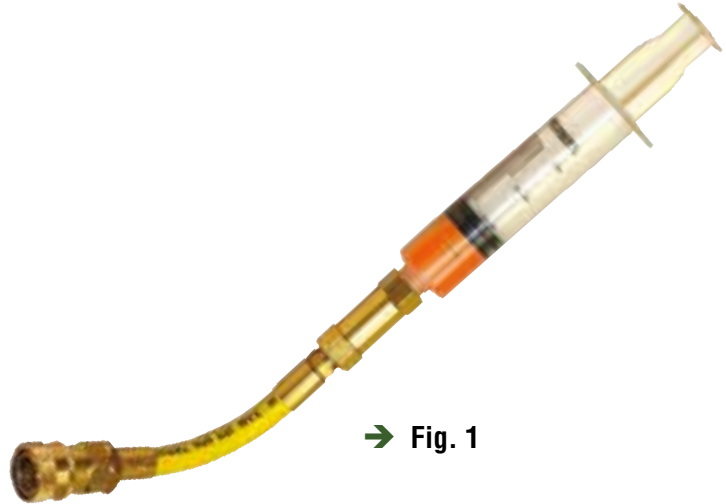


INJECTION METHODS

Tracerline® offers four different injection methods, each appropriate for the size of the system being serviced.

TP-9881

Bottled dyes are extremely cost effective, as they accommodate dye purchased in bulk. There are two popular bottled dye injectors for A/C systems. A syringe injector (like the Tracerline® TP-9881 shown in Fig. 1) is used to manually inject dye into a vehicle's A/C system.



→ Fig. 1



→ Fig. 2

TP-9882

Another popular option when using bottled dyes is a refillable inline injector (like the Tracerline® TP-9882 shown in Fig. 2). This is recommended for vehicles with larger AC&R systems as it holds up to 2 ounces of dye.

EZ-JECT™ AND MINI-EZ™

The simplest way to add fluorescent dyes into vehicle air conditioning and refrigeration systems, without the use of additional refrigerant, is by using Tracerline's EZ-Ject™ injector (shown in Fig. 3). Available with multi-dose EZ-Ject or single-dose Mini-EZ™ cartridges, it's one of the most accurate and compact methods of injecting A/C dye. This injector is also available with dye cartridges compatible with R-1234yf systems, as well as hybrid vehicles. Multi-dose cartridges service up to 14 vehicles, while the single-dose cartridge offers better inventory control with single billable servicing.



→ Fig. 3



→ Fig. 4

EZ-SHOT™

Larger multi-dose dye cartridges are cost efficient when working on larger or lots of vehicles. A multi-dose injector (like the EZ-Shot™ shown in Fig. 4) can be used to inject dye into an A/C system with a single hook up. Simply squeeze the trigger to inject the dye. Its pistol-grip style allows for super-fast dosing. Using an 8 oz. cartridge, this injector can service up to 64 vehicles.

Tracerline® dyes are OEM approved by major vehicle, compressor, lubricant and refrigerant manufacturers worldwide. They are still the only dyes that are added to A/C systems on the vehicle production line by auto makers in the U.S., Japan, Germany, the U.K., Italy, France, Sweden, China, Korea, Brazil and Mexico.



For information on all of our fluorescent leak detection products, please visit our website at

www.tracerline.com

For questions or inquiries contact us [here](#).