

**for detection of lead deposits in motor vehicle tailpipes**

When running a vehicle on leaded fuel, lead compounds deposit in the tailpipe. PLUMBTESMO® is extremely well suited to detect such deposits and thus determine whether a vehicle with catalyst has recently been erroneously or intentionally operated on leaded fuel. However, PLUMBTESMO® cannot be used to detect lead in gasoline.

**Method of application:**

1. Be sure engine is off and tailpipe is warm (not burning hot!).
2. Remove a test paper from the container and reseal container immediately. Moisten test paper with 2 drops distilled water. Do not saturate the paper since the reactive material may be washed away.
3. **Immediately** after moistening press the paper firmly on to the inner surface of the tailpipe with your finger (disposable glove recommended) or a cloth-pin and hold for at least one minute.
4. Remove the test paper. A red or pink coloration indicates the presence of lead. In the case of only trace amounts, however, the change may not be evident until the paper dries.
5. If soot deposits in the tailpipe interfere with or mask the color reaction on the paper, degrease a section of the inside of the tailpipe by spraying acetone onto it. The side of the tailpipe is preferred because the dissolved soot will run down with the acetone, while the lead deposits (if present) will remain on the wall and can be detected as described above. Do not use a cloth to remove the soot because it may wipe off the lead deposits, too!
6. Do not use PLUMBTESMO® around or below the freezing point.

**Further testing is recommended if color change occurs, i.e. if the test is positive.**

Because the lead test with PLUMBTESMO® is very sensitive, care must be taken to avoid contamination of the test paper. Washing hands after each positive test or using disposable gloves, which are discarded after each positive test, is recommended. Never use a test paper that has fallen to the ground, because the dust or soil may contain lead, which will give a positive test upon moistening the paper. The above is a simplified procedure.

**Test paper for the determination of lead**

PLUMBTESMO® determines metallic lead and lead salts on surfaces and in solutions.

**Color reaction:**

The test paper turns pink to dark purple. Orange colored rings of the detection reagent disappear after a few minutes. Pink colorations at the rim of the test paper do not interfere with the determination.

**Method of application:**

Remove only as many test papers as are required, and reseal the container immediately after use. Avoid touching the test paper zone.

**a) Determination of lead on surfaces**

**Moisten test paper with distilled water** and press firmly for two minutes against the degreased surface to be tested. Substantial quantities of lead result in an immediate reaction, whereas smaller amounts of lead will only show after several minutes. In any case evaluation should be made within 15 minutes. As little as 0.05 µg Pb can be detected.

**b) Determination of lead in solutions**

Moisten test paper with distilled water. Drop test solution onto the moistened strip or dip the moistened strip into the test solution. A red color indicates the presence of lead. The procedure permits the determination of lead in quantities of more than 100 mg/L. Lead in concentrations from 5 to 300 mg/L can be determined by dipping one end of a **dry** PLUMBTESMO® strip into the test solution. When the solution has ascended to the top of the strip, appearance of a red border immediately above the liquid level indicates the presence of lead.

Concentrations below 5 mg/L can be detected by evaporating a drop of the test solution on a clean glass slide. The residue is tested for lead as described under a).

**Interferences:**

The following elements, when present in large quantities, interfere with the reaction: tellurium, silver, cadmium, barium and strontium. Large amounts of nitrate ions reduce the sensitivity of PLUMBTESMO®. When the presence of interfering cations is suspected, they can be eliminated by the following procedure (except for barium and strontium): Apply a few drops of an aqueous solution of 20 mg potassium cyanide in 100 mL water to the red spots on the test paper, and shake in a micro test tube with an equal volume of 1.5 mg dithizone in 100 mL carbon tetrachloride. The green dithizone / carbon tetrachloride solution turns brick-red in the presence of lead.

**Storage:**

Avoid exposing the test papers to sunlight and moisture. Store the container 4–30 °C in a dry place.