

Lead (Pb) Testing in New Zealand Homes

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1. EXECUTIVE SUMMARY

Lead is a non-essential element that has adverse health effects even at low exposure levels. There is no level of exposure that is considered safe and management of exposure to lead is intended to reduce exposure to as low as reasonably achievable. Food and water are the main exposure sources of lead in humans. Non occupational sources such as paint, dust and soil also contribute to overall exposure to lead but this is generally lower than the exposure from diet. However, it should be noted that levels of dietary lead exposure in New Zealand have been shown to be low and, in some cases, exposure from other sources may predominate.

In New Zealand, lead-based paint has consistently been the most common, known non-occupational source of lead exposure with 320 notifications due to elevated blood lead levels reported during the period 2014–2023.

Paint on houses and public buildings built before 1970 is expected to be lead-based. Due to leaching from or breakdown of this paint, dust and soil containing lead are the other sources of lead exposure in residential or domestic settings. Children are the most vulnerable to adverse health effects of lead as they can ingest chips and flakes of paint, chew surfaces (windows and windowsill, doors and door frames, railings) painted with lead-based paint and ingest lead-contaminated soil. Dust containing lead can be generated during renovation, repair or painting activities and this dust can be inhaled or ingested by children due to the hand-to-mouth activity. Therefore, ingestion and inhalation are the main routes of exposure to lead in a household setting. The dermal route is not a significant exposure route as dermal absorption of inorganic lead is generally low.

The purpose of this document is to gather information on a) the performance of commercially available lead testing kits and their limitations, and b) identify lead testing or sampling kits available in New Zealand and recommended by regulatory authorities in New Zealand and by any overseas regulators.

When the presence of lead-based paint is suspected, the traditional chemical test kits (swab/spot test), based on specific colourimetric reactions, are most commonly used in initial screening due to their convenience and affordability, allowing homeowners or public health officials to quickly check for the presence of lead. There are no performance criteria for lead testing kits established by any New Zealand regulatory authority. However, the United States Environmental Protection Agency has set performance criteria based on false-negative and false-positive response rates of the kits. To date, no lead testing kit has met both of these performance criteria. However, the Agency recognises three kits that meet the negative response criterion (low rate of false negative responses). None of these kits are currently available in New Zealand. The swab kits are generally not reliable due to the high rates of false positives and false negatives in performance studies. Some lead testing kits also claim to detect lead in plastic, metal and children's toys but the reliability will always be questionable as these kits are generally intended to be used for lead contaminated paint and dust.

There are five testing kits currently available in New Zealand to test for lead in painted surfaces. No performance studies have been reported on four kits. Therefore, the reliability of these kits is not known. The performance characteristics of the fifth kit have been assessed by the manufacturer but not by an independent authority.

Portable X-ray fluorescence analysers and laboratory methods such as inductively coupled plasma-mass spectrometry, and atomic absorption spectrometry can provide quantitative

results that are accurate and reliable. However, these methods require training, are expensive due to the equipment required, and can take time to provide results.

Given the limited availability of the lead testing kits and the performance limitations of currently available products, it is advised to be vigilant for new products or detection methods that are being developed and could meet performance criteria set by the Environmental Protection Agency. The Lumetallix instant lead detection kit is a new lead testing kit that is reported to completely meet the performance criteria set by the Environmental Protection Agency, based on manufacturer evaluation.

2. INTRODUCTION

Human exposure to lead (Pb) occurs mainly through food and water, with some exposure via air, paint/dust and soil. Exposure to Pb can also occur from specific occupational or non-occupational sources.

Pb is absorbed to a greater extent in children than in adults and accumulates in soft tissues and, over time, in bones (ATSDR, 2020). There are no health-based guidance values for Pb as there is no evidence of thresholds for a number of critical health effects (developmental neurotoxicity in young children and cardiovascular effects and nephrotoxicity in adults) (ATSDR, 2020; EFSA, 2010; JECFA, 2011). Hence, there is no level of exposure that is considered safe and management of exposure to Pb is intended to reduce exposure to as low as reasonably achievable (ALARA). This resulted in the decrease of the notifiable blood Pb level (BLL) in New Zealand from 0.48 µmol/L (10 µg/dL) to 0.24 µmol/L (5 µg/dL) in 2021 (Te Whatu Ora, 2024).

In New Zealand, non-occupational Pb absorption notifications have roughly doubled since the introduction of the new notification level in 2021 (EHINZ, 2023). Pb-based paint has consistently been the most common, known non-occupational (320 notifications) and occupational (215 notifications) source of Pb exposure from 2014–2023 and 2022–2023, respectively (EHINZ, 2023; 2024). The median BLLs in notified cases associated with Pb-based paint are presented in Table 1 (EHINZ, 2023).

Table 1: Blood lead level (µg/dL) in notified cases due to lead-based paints in occupational (2022 to 2023) and non-occupational settings (2014 to 2023)

Setting	Notifications	Median (range)
Non-occupational	320	13.88 (10.36–20.72)
Occupational	215	10.15 (6.63–17.2)

Other sources of Pb exposure associated with non-occupational Pb absorption notifications in decreasing order are from attending rifle ranges, bullet/sinker manufacture, pica, and use of traditional medicine/cosmetics (EHINZ, 2023). A large number of Pb absorption notifications (456) from 2014–2023 did not identify the source of the Pb exposure.

2.1 PURPOSE OF THE DOCUMENT

Te Whatu Ora – Health New Zealand asked PHF Science to provide information on:

- 1 Sources of domestic Pb exposure (non-occupational) to the general public, including children.
- 2 Pb testing methods available for the general public.
- 3 Performance of commercially available Pb testing kits. Identify Pb testing or sampling kits available in New Zealand and recommended by regulatory authorities in New Zealand and by any overseas regulators.
- 4 Limitations of Pb testing kits.

3. SOURCES OF DOMESTIC LEAD EXPOSURES

The main sources of Pb exposure in the indoor environment (houses, public buildings) are paint, dust and soil. These are briefly discussed below.

3.1 PAINTS

As mentioned previously, contact with Pb-based paints is the most commonly reported exposure for Pb absorption notifications in New Zealand (EHINZ, 2023). This is expected as Pb as lead carbonate was the principle white pigment in paints for houses and public buildings constructed before 1970 (HNZ, 2024). Although less common, lead chromate was also a basic pigment for some green, red, orange, and yellow house paints. Therefore, old houses and buildings can still have Pb paint that may often be covered with layers of Pb-free paint. In New Zealand, AS/NZS 4361.2:2017 *Guide to hazardous paint management* provide guidelines for management of Pb paints and related hazards on non-industrial buildings (AS/NZS, 2017). Under this standard, a paint that contains less than, or equal to, 0.1% Pb by mass in the dry film is considered as a Pb-free paint whereas a paint film that contains greater than 0.1% Pb by mass in the dry film is considered Pb-based (AS/NZS, 2017). In contrast, the US Environmental Protection Agency (US EPA) defines Pb-based paint as paint with Pb levels greater than or equal to 1.0 mg/cm², or more than 0.5% by weight (US EPA, 2021).

Recently, the New Zealand's Environmental Protection Authority (EPA) proposed cuts to the levels of Pb impurities allowed in paints (NZEPA, 2024). From 1 March 2025:

- a) Pb impurities in all paints covered by the Surface Coatings and Colourants Group Standards and Aerosols Group Standards must not exceed 0.009% (NZEPA, 2024).
- b) Anti-rust paints covered by the Corrosion Inhibitors Group Standards now must also meet the 0.009% Pb impurity limits (NZEPA, 2024).

The above limit of Pb in domestic paints is in line with the Australian Uniform Paint Standard and the US Consumer Product Safety Commission (CPSC) (CPSC, 2025; eCFR, 2025a; SA Health, 2025). However, for corrosive and anti-fouling paints the limit is higher (0.1%) in Australia.

Lead in painted surfaces does not represent a risk to health if it is left undisturbed behind layers of Pb-free paint. Also, Pb containing ingredients in the paint are not volatile so they do not evaporate from the paint film. However, over time, deterioration (peeling, chipping, chalking, cracking, damaged, or damp) of Pb-based paint may result in the Pb being incorporated in media (dust and soil) that humans may be exposed to (US EPA, 2024). Certain Pb-based paints can have a sweet taste, and children in the house can ingest the chips and flakes fallen off due to the deterioration, as they exhibit specific habits such as mouthing, sucking and chewing on articles or extreme behaviours like pica, characterised by compulsive eating of non-food items.

Many surfaces or objects (windows and windowsill, doors and door frames, railings) that are prone to wear and tear may also have been painted with Pb-based paint. It is possible that children can chew these surfaces and ingest Pb.

3.2 DUST

In the indoor environment, dust containing Pb can be generated during renovation, repair or painting activities (Kreher, 2020; US EPA, 2024). Jobs such as demolition, window replacement, opening up walls, etc., can also release accumulated Pb dust into the home. Even after a typical renovation cleanup, elevated levels of Pb dust can remain.

3.3 SOIL

Soil is not a source of Pb exposure in an indoor environment but is an important source of exposure in a household or domestic setting, especially for children while playing in the garden or yard. Soil contamination can happen due to the flaking or peeling of Pb-based paint on the exterior of the house (US EPA, 2024). Other reasons for soil contamination can be from the past use of leaded gasoline in cars, from industrial sources, or even from contaminated sites (US EPA, 2024). Precautions should be taken to ensure that young children do not ingest contaminated soil as a result of hand-to-mouth activity.

The Pb from the soil can also be transferred to fruits, vegetables, and eggs from backyard poultry. In a study conducted in Auckland households (built before 1941 and 1941-1961), Pb was detected in the eggs and the blood of hens (Cowie and Gartrell, 2019). The concentrations of Pb in the yolk and eggshell ranged from 0.003–1.07 mg/kg and <0.1–0.82 mg/kg, respectively. Pb levels were higher in hens from properties with homes built before 1941 than between 1941-1960 and in hens from properties with weatherboard homes than brick homes. It was concluded that hens on properties with older weatherboard homes were ingesting old paint flakes, paint dust in soil and accumulated paint Pb in earthworms and arthropods when free foraging (Cowie and Gartrell, 2019).

4. LEAD TESTING

Testing of Pb in paint can be broadly categorised into invasive and non-invasive methods.

4.1 NON-INVASIVE METHODS

Testing by these methods is usually done on site with no damage to the painted surface as no sample collection is required. The results can be qualitative or (semi) quantitative. Some examples of non-invasive methods are chemical test kits (swab/spot test), dust wipes and X-ray fluorescence.

Chemical test kits (swab/spot test): Swab tests are the most commonly used method for initial screening for Pb detection due to their convenience and affordability, allowing homeowners to quickly check for the presence of Pb (Korfmacher and Dixon, 2007). These kits are based on specific colourimetric reactions. The most commonly used colourimetric reactions involved the rhodizonate ion, which turns pink or red when reacting with Pb, (Buehler and Rhoda, 2012; Korfmacher and Dixon, 2007) or the sulphide ion, which reacts with Pb(II) ion to give a colour change from clear to grey or black (Rossiter *et al.*, 2000). Examples of kits of these types are shown in Figure 1.

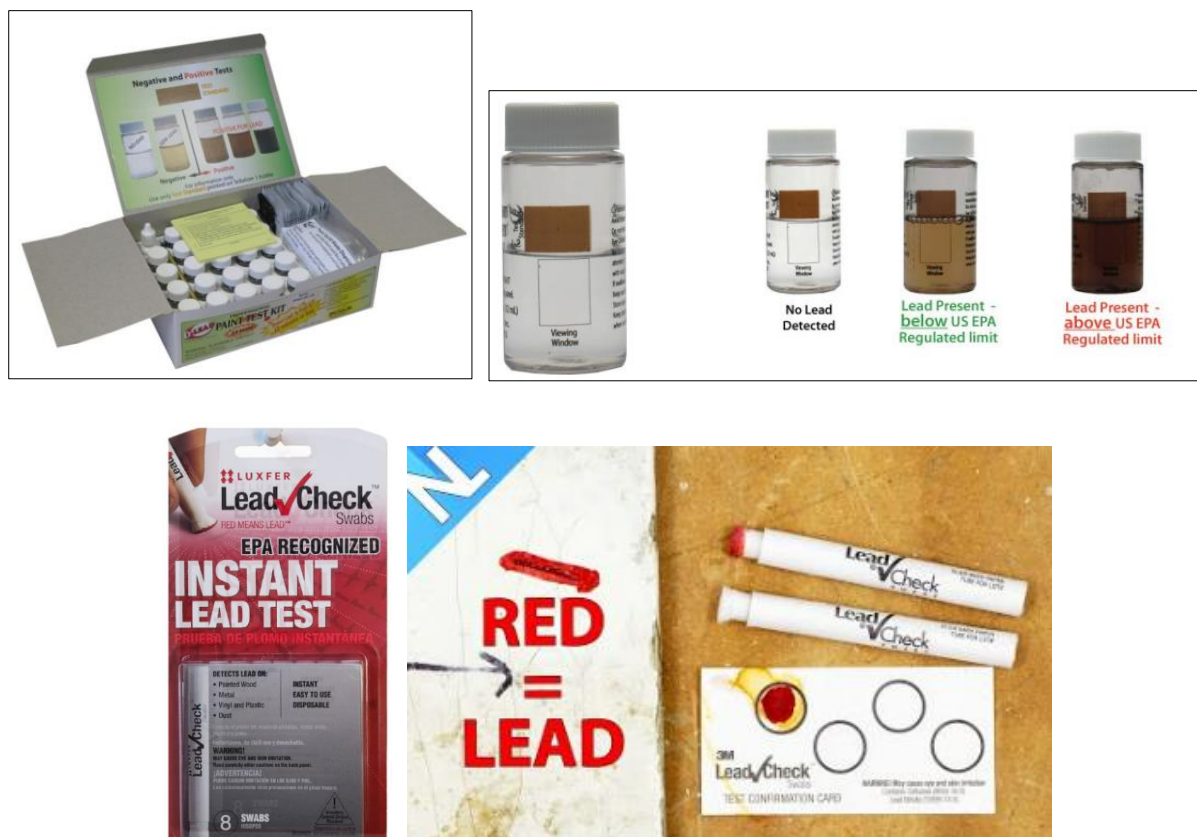


Figure 1: The D-Lead® and Luxfer LeadCheck Paint Test Kit and their colour standard comparisons

Photoluminescent test: Recently, a research group in the Netherlands has developed a Pb detection method that is based on the formation of light-emitting Pb halide perovskite semiconductors (Helmbrecht *et al.*, 2023). This test involves directly spraying the material of interest with methylammonium bromide that converts Pb into a perovskite semiconductor. The perovskite emits green photoluminescence under an ultraviolet flashlight. The principles of the method are shown in Figure 2.

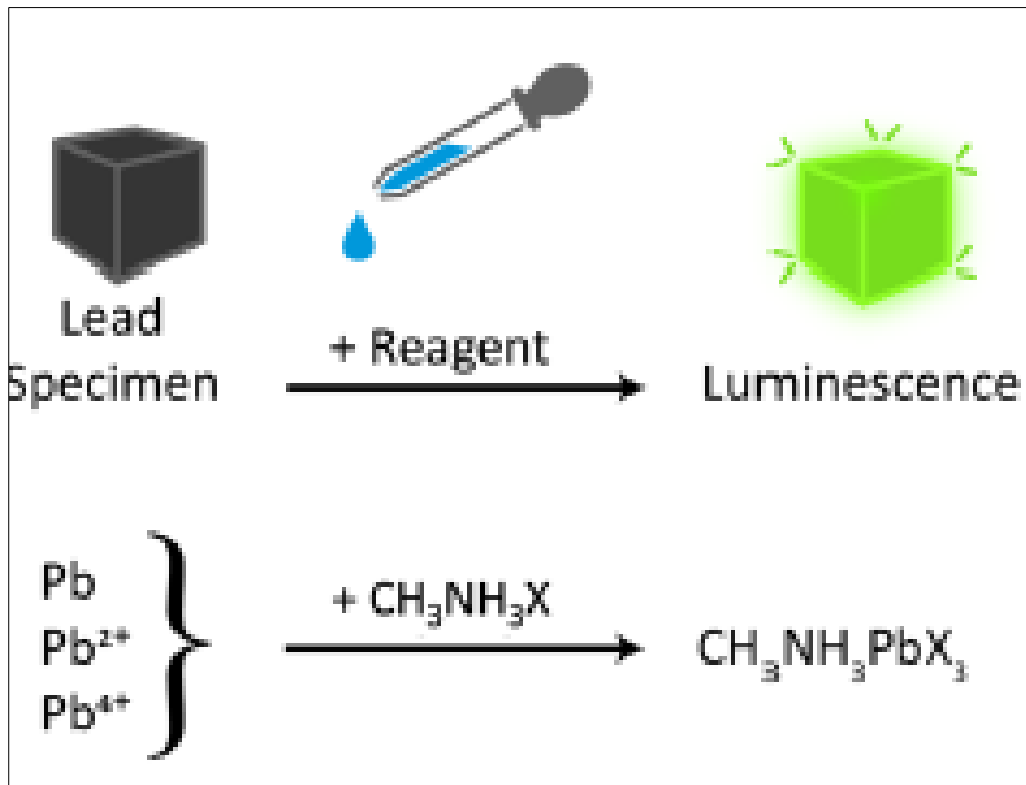


Figure 2: Concept of photoluminescent lead detection

The test kit commercially known as Lumetallix instant Pb detection is available in New Zealand from DLM Wallace¹ and can also be purchased from the company's website². The cost of one kit ranges from \$139 to \$159 NZD and can be used for at least 400 tests. The test kit is shown in Figure 3.

¹ <https://dlmwallace.co.nz/products/lumetallix-instant-lead-detection-kit?srsId=AfmBOopFh-VjZsnQ57mRuJ7UIJDtgEyPS8Lj7ewMzQG2NcU-hR7COZo5> (Assessed date: 17 December 2025)

² <https://www.lumetallix.com/> (Assessed date: 17 December 2025)



Figure 3: Lumetallix lead test kit

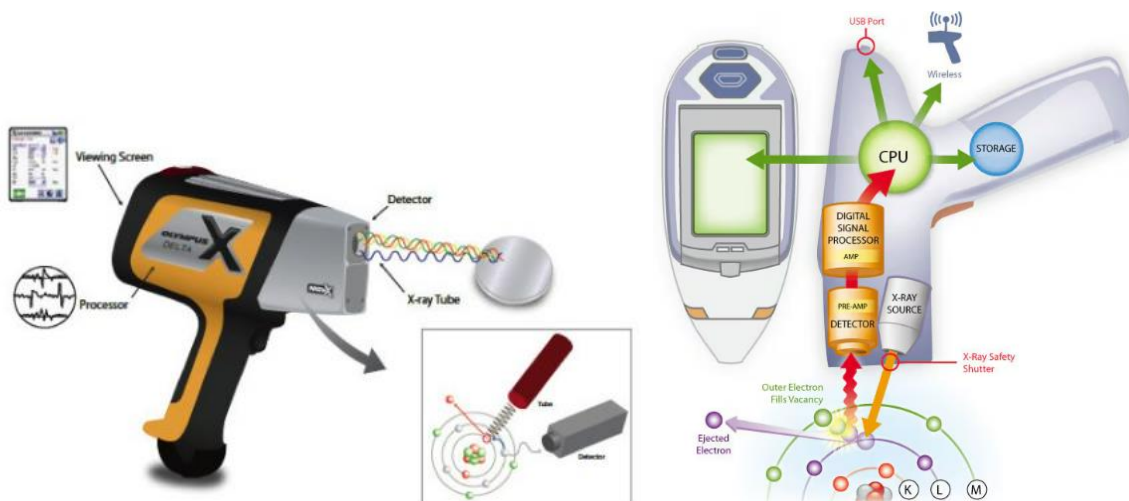
Dust wipes: These are specialised pre-moistened wipes that are used to collect dust samples suspected of Pb contamination. Wipe samples are generally collected from several areas (usually floors and windowsills) within the home to ensure that samples are representative focusing on those areas where children may play. The dust wipes are not, in themselves, a Pb analysis method but are a non-invasive means of taking samples for later analysis. These wipes are then sent to an accredited laboratory for further testing. In New Zealand, GhostWipes, a type of dust wipe specifically marketed for collection of lead-contaminated dust samples, are available from MicroAnalytix³. GhostWipes are shown in Figure 4.

³ <https://www.microanalytix.co.nz/ghost-wipe-lead-dust-wipe> (Assessed date: 22 December 2025)



Figure 4: Ghostwipes for dust sampling

Hand-held X-ray fluorescence (XRF) analyser: Portable XRF instruments can rapidly and non-destructively determine low concentrations of Pb in paint and dust. However, the upfront purchase price of the equipment can be high (several thousand dollars). The sample is irradiated with X-rays that interact with the atoms causing them to release secondary x-rays known as fluorescence. Despite many advantages like portability and fast results, XRF has some disadvantages. Handheld XRF analysers are typically limited to surface level analysis making them less effective for multi-layered or coated materials. A typical XRF machine and the analytical principles are shown in Figure 5.



Source: Henry Royce Institute⁴ and Thermofisher⁵

Figure 5: Hand-held X-ray fluorescence analyser

⁴ [X-ray Fluorescence \(XRF\) Analyser - Henry Royce Institute](#) (Assessed date: 11 December 2025)

⁵ <https://www.thermofisher.com/blog/mining/technology-focus-x-ray-fluorescence-xrf-in-mining/> (Assessed date: 11 December 2025)

4.2 INVASIVE METHODS

Invasive methods involve physical sampling of the painted surface, which is often damaging to the painted surface. The sample is then sent to an accredited laboratory for quantitative determination of Pb (US EPA, 2025). Some examples of invasive methods include atomic absorption spectrometry (AAS) and inductively coupled plasma mass spectroscopy (ICP-MS).

5. PERFORMANCE OF LEAD TESTING KITS

There are no performance criteria for Pb testing kits established by any New Zealand regulatory authority.

The US EPA has set performance criteria for Pb testing kits, based on negative and positive responses for test kits under the *Lead Renovation, Repair and Painting Rule* (eCFR, 2025b; US EPA, 2025). It should be noted that the US EPA performance criteria have been established to align with the Federal standard (set by the Department of Housing and Urban Development). The standard specifies a limit concentration of 1 mg/cm² Pb of painted surface and is used to classify a painted surface as with or without Pb-based paint. Therefore, painted surfaces with 0.9 mg/cm² of Pb or less are classified as having no detectable Pb and painted surfaces measured at 1 mg/cm² or greater are considered to contain Pb. The US EPA performance criteria are:

'The negative response criterion states that for paint containing Pb at or above the regulated level, 1.0 mg/cm² or 0.5% by weight, a demonstrated probability (with 95% confidence) of a negative response less than or equal to 5% of the time must be met' (eCFR, 2025b).'

'The positive-response criterion states that for paint containing Pb below the regulated level, 1.0 mg/cm² or 0.5% by weight, a demonstrated probability (with 95% confidence) of a positive response less than or equal to 10% of the time must be met (eCFR, 2025b).'

It should also be noted that the Federal standard for paint Pb loading is not a health-based standard, implying 1 mg/cm² is not necessarily a threshold for determining safe or unsafe conditions. It appears that the Pb limit in wet paint (0.009%) and in a painted surface (1 mg/cm² or 0.5%) were developed independently.

The US EPA rule required that for Pb testing kits recognised before September 1, 2010, the negative response criterion must be met, while for Pb testing kits recognised after September 1, 2010, both the negative response and positive response must be met (eCFR, 2025b). To date, no Pb testing kit has met both of the performance criteria mentioned above. However, there are three kits recognised and recommended by the US EPA that meet the negative response criterion.

The three kits recognised by the US EPA are LeadCheck™ (formerly known as 3M™ LeadCheck), D-Lead®, and the State of Massachusetts lead test kit (US EPA, 2025). None of these kits are available in New Zealand. Although these kits are available to the public in the US, the US EPA only recognises tests performed by certified inspectors, risk assessors and certified renovators.

5.1 LABORATORY EVALUATION OF LEAD TESTING KITS PERFORMANCE

There are several studies published that report the performance of Pb testing kits:

- 1) The performance of eight commercial Pb test kits (four sulphide-based and four rhodizonate-based) was evaluated for their ability to detect the presence and absence of Pb in paint in residences (Rossiter *et al.*, 2000). The brands of test kits were not

disclosed in the test report. The study involved conducting more than 3000 spot tests by certified Pb inspectors or risk assessors. Test specimens were prepared using ten concentrations (0 to 3.5 mg/cm²) of either white lead or lead chromate pigments mixed in an alkyd paint. Specimens consisted of non-reactive (wood) and reactive (sulphide kits: steel and rhodizonate kits: gypsum) substrates. In this test, the selected Pb levels for analysing false positives and false negatives were 0 mg/cm² and 1 mg/cm², respectively.

The response of the kits was seen to vary considerably at the 0 mg/cm² Pb⁶ level (Rossiter *et al.*, 2000). The false negative⁷ rates for white lead ranged from 2 to 42% whereas that for lead chromate ranged from 1 to 82%. All the kits, with the exception of one, erroneously indicated the presence of Pb. The false positive rate⁸ for all kits was ≤12% for both Pb pigment types, with the exception of one sulfide-based spot test kit whose false positive rate was 50%.

The response of the kits was also seen to vary considerably at 1 mg/cm² Pb level. The false positive rate was ≥30% (Rossiter *et al.*, 2000). Only one kit had false positives <10%. For white lead and lead chromate, the false negative rates ranged from 0 to 27% and 1 to 80%, respectively.

Some of the test kits met the US EPA negative screen criterion for Pb-based paint (Rossiter *et al.*, 2000). However, this was dependent on the type of Pb pigment in the test specimen. For white lead specimens, six kits—three sulphide-based and three rhodizonate-based gave false negative rates of less than or equal to 5% and met the proposed negative screen criterion. For lead chromate specimens, three of these six kits—two sulphide-based and one rhodizonate—had false negative rates of less than or equal to 5% and met the proposed negative screen criterion.

- 2) In 2007, the US CPSC drafted a report that summarised four studies conducted on the performance of commercially available Pb testing kits. The brand names of the testing kits were not disclosed in the report. The tests were conducted by CPSC in 1992, 1994, 2003, and 2007 (CPSC, 2007). All the four studies concluded that Pb test kits may not always be reliable because of the false positive (2%) or false negative (up to 53%) results. The inaccuracy in results may be due to interference of other substances (e.g., chromate may interfere with rhodizonate kits; iron may react with sulphide kits). In one of the studies, XRF correctly identified the presence of Pb in 12 out of 13 samples (paint and other products), with one false negative for a sample of metal jewellery with nickel and copper plating. It should be noted that XRF is generally not available for consumer use. Overall, the CPSC did not recommend the use of consumer Pb test kits because of their unreliable performance (CPSC, 2007).
- 3) The LeadCheck™ test kit was evaluated for its performance on different surfaces (drywall, metal, plaster, or wood) painted with paints of known target Pb concentrations

⁶ A Pb level of 0 mg/cm² is the designation assigned to test panels for Pb was not added to the paint films. Measurements showed that the Pb levels of these panels was < 0.009 mg/cm².

⁷ A false negative has been defined as a test result that is negative for lead, but the true value is above the selected lead level

⁸ A false positive for the 0 mg/cm² Pb level indicates that a positive result was obtained for a test panel to which no Pb had been added and for which the measured Pb level was at least < 0.009 mg/cm².

(0.0, 0.3, 0.6, 1.0, 1.4, 2.0, and 6.0 mg/cm²) (Buehler and Rhoda, 2012). Test concentrations of Pb were confirmed by inductively coupled plasma-atomic emission spectrometry (ICP-AES) analysis of individual paint chip samples taken from each surface during testing. The average confirmed Pb levels in the surfaces were 0, 0.35, 0.84, 1.18, 1.50, 2.43 and 9.01 mg/cm². It should be noted that for evaluation purposes, test kit results were always compared to the confirmed Pb levels, not the target.

LeadCheck™ test kit is already approved by the US EPA for use on metal and wood. False positive⁹ rates were assessed on panels with confirmed Pb levels at 0.84 mg/cm² and lower whereas false negative rates were assessed on panels with confirmed Pb levels at 1.18 mg/cm² and higher. The results of this study revealed very high false positive rates i.e 70 to 98% and 75 to 98% with confirmed levels of <0.8 mg/cm² and <1.0 mg/cm², respectively. The false negative rate was 0 to 1% with confirmed Pb levels of 1 or ≥1.2 mg/cm². Therefore, the LeadCheck™ does not meet the positive response criterion (<10%) set by the US EPA. It should be noted that US EPA's definition of a false positive result is not that the test gives a positive result when the analyte (Pb) is not present, rather, the test gives a positive response when the Pb concentrations is <1 mg/cm².

Similarly, D-Lead® paint test kit was evaluated for performance with the same Pb concentrations on different surfaces (wood, metal, drywall, plaster wall) (Buehler *et al.*, 2010). An overall high false positive rates i.e 16 to 30% and 30 to 42% with confirmed levels of <0.8 mg/cm² and <1.0 mg/cm², respectively was reported. The false negative rate was 0 to 1% with confirmed Pb levels of 1 or ≥1.2 mg/cm². Therefore, the D-Lead® test kit does not meet the positive response criterion (<10%) set by the US EPA.

- 4) Korfmacher and Dixon (2007) evaluated the reliability of LeadCheck™ test kits in a field study to detect Pb in dust above US EPA's dust Pb standard for floors (40 µg/ft² for floors). Along with the swabs, trained risk assessors also collected dust samples from floor and windowsills using standard dust wipes. The wipes were analysed in a certified laboratory using the EPA 7420 method utilising flame atomic absorption spectroscopy. The swab results were compared with the laboratory results for the corresponding dust wipe (over or under 40 µg/ft²). The results of the study revealed an overall high false negative rate of 64% (sensitivity 36%) in dust samples collected from floor and sills. The sensitivity of swabs was higher on painted surfaces (45%) than on unpainted surfaces (20%). The swabs performed better in sills than on floors. This may be due to the higher dust Pb loadings on sills i.e 78% of the samples were above 40 µg/ft². Therefore, due to high false negative results, the LeadCheck™ swabs did not reliably detect Pb in dust above 40 µg/ft² using published methods under field conditions.
- 5) Helmbrecht *et al.* (2023) evaluated the Lumetallix test kit, that detects Pb by forming light-emitting Pb halide perovskite semiconductors (Helmbrecht *et al.*, 2023). In this test, the substance of interest is directly sprayed with methylammonium bromide, which transforms Pb into a perovskite semiconductor. When exposed to an ultraviolet illumination, the perovskite produces green photoluminescence.


⁹ A false positive is a test result that is positive for lead, but the true value is below the selected lead level.

This method detects Pb in soil, paint, glazing, cables, glass, plastics, and dust. The performance test was conducted on more than 50 different materials and found no false negatives or false positives (Helmbrecht *et al.*, 2023). It should be noted that, in this study, false negative and false positive had their more conventional meanings. That is, a false negative would be a negative response when lead was known to be present, irrespective of the concentration. The method is reported to detect as little as 0.0001 mg/cm² (1 ng/mm²) of Pb by the naked eye and 5e-6 mg/cm² (50 pg/mm²) using a digital photo camera. The authors claim that the testing method outperforms commercially available rhodizonate colouring tests with more than 1000 times higher sensitivity, superior chemoselectivity, and straightforward interpretation of results. The Lumetallix kit as of now is not recognised by the US EPA. However, according to the company's website the patent for this test kit is pending. It is possible that after the patent is granted the company may apply for the US EPA's recognition as it is reported to meet both the negative response and positive response criterion.

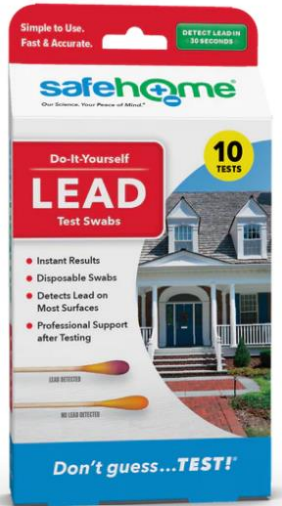

5.2 LEAD TESTING KITS AVAILABLE IN NEW ZEALAND

An internet search was conducted for available Pb testing kits in New Zealand. Five Pb testing kits were identified and summary details are presented in Table 2.

Table 2: Lead testing kits advertised on New Zealand websites



Brand name	Chemistry	Scope of use	Claims
DLM Wallace ¹⁰ 	Rhodizonate	Painted walls, wood, plastic and metal.	For screening purposes only. Detect Pb in 30 seconds.

¹⁰ [Lead Test Swabs for paint, wood, plastic DIY NZ – DLM Wallace](#) (Assessed date: 14 January 2026)

<p>SafeHome¹¹</p>  <p>The image shows the packaging for SafeHome Lead Test Swabs. It is a white and red box with a clear window showing the swabs. Text on the box includes 'Simple to Use. Fast & Accurate.', 'DETECT LEAD IN 30 SECONDS', 'safehome Our Science. Your Peace of Mind.', 'Do-It-Yourself LEAD Test Swabs', '10 TESTS', 'Instant Results', 'Disposable Swabs', 'Detects Lead on Most Surfaces', 'Professional Support after Testing', and 'Don't guess...TEST!'.</p>	<p>Rhodizonate</p>	<p>Detects Pb on most surfaces including painted walls, wood, plastic, metal, children's toys, and furniture.</p>	<p>Detects Pb in 30 seconds.</p> <p>The test kits have been independently vetted by major laboratories including American Red Cross laboratories, Merck laboratories and Underwriter Laboratories.</p>
<p>iQuip® Lead Testing Kit^{*12}</p>  <p>The image shows the packaging for iQuip Instant Lead Test Swabs. It is a black and white box with a clear window showing two swabs. Text on the box includes 'iQuip', 'INSTANT LEAD TEST', 'Swabs', 'DETECTS LEAD ON Painted Wood, Metal, Vinyl & Plastic, Drywall & Plaster', 'INSTANT EASY TO USE DISPOSABLE', 'RED INDICATES LEAD', and '2 Swabs'.</p>	<p>Rhodizonate</p>	<p>Surface Pb test swab colorimetric test for Pb in paint and other non-porous surfaces.</p> <p>Detects Pb on: Painted wood, Metal, Vinyl & plastic, Drywall & plaster</p>	<p>Instant identification</p>

¹¹ [Lead Test Swabs - Instant DIY - 10 Pack - Safe Home – EWB Test Kits](#) (Assessed date: 14 January 2026)

¹² [iQuip® Lead Testing Kit | Almax](#) (Assessed date: 14 January 2026)

<p>Lead test swabs- TradeMe¹³</p>  <p>The image shows a clear plastic jar labeled 'Lead Test Swabs' containing several swabs. Next to the jar are four individual swabs with orange tips and wooden handles. The jar label includes instructions and technical details.</p>	<p>Rhodizonate</p>	<p>Suitable for Pb inspection of substances, such as tableware, paint, cosmetics, toys, woodworkin g, tableware, jewellery, bathtub glaze, pottery, antiques, plumbing, etc.</p>	<p>Detects Pb in 30 seconds.</p> <p>With the anti-interference ability.</p> <p>The Pb paint test kit has high test sensitivity,</p>
<p>Lumetallix instant lead detection kit^{**14}</p> <p>Find lead in paints, ceramics, glass, pipes, metals, plastics, toys and more.</p>  <p>The image displays the components of the Lumetallix kit: a small white reagent dropper (1), a white reagent spray bottle (2), a black flashlight (3), and a cardboard transport box (4) labeled '400+ TESTS Instant Lead Detection'. A numbered list identifies each item.</p> <ol style="list-style-type: none"> 1. Lead Detection Reagent Dropper 2. Lead Detection Reagent Spray 3. Lumetallix LeadLight 4. Transport Box with Battery & Instructions 	<p>Photoluminescenc e</p>	<p>Works on paint, ceramics, plastics, glass, toys, pipes, soil, metal, and more.</p>	<p>Quickly and easily detect Pb.</p> <p>1000x more sensitive than traditional swabs, detecting Pb across a wide area in seconds.</p> <p>Detects Pb concentration s as low as 500 ppm, exceeding EPA RRP standards by 10x</p>

*Also available from Resene

** The test kit was out of stock in New Zealand at the time of writing of this report

Note that performance studies were not available on the kits available in New Zealand, except for Lumetallix instant Pb detection kit.

¹³ [Listing #5737467842 | Trade Me Marketplace](#) (Assessed date: 14 January 2026)

¹⁴ <https://dlmwallace.co.nz/products/lumetallix-instant-lead-detection-kit?srltid=AfmBOopFh-VjZsnQ57mRuJ7UIJDtgEyPS8Lj7ewMzQG2NcU-hR7COZo5> (Assessed date: 14 January 2026)

6. LIMITATIONS OF LEAD TESTING KITS

The traditional Pb testing kits/swabs (rhodizonate and sulphide based) can be used for initial screening but they present many limitations due their unreliability. The pros and cons of Pb testing kits is presented in Table 3.

Table 3: Pros and cons of lead testing kits

Pros	Cons
Usually non-destructive	Provides qualitative or semi-quantitative results
Affordable and convenient	Not reliable as high incidences of false positive results
Quick results	May not detect Pb at very low thresholds that may still pose a health risk.
Professional training not required	Interference of matrix (plaster) and other chemicals like chromates

As discussed in section 5.1 of this report, due to the high false positive rates (paint) and false negative rates (dust), confirmatory methods such as ICP-MS and AAS are the most reliable to detect and quantify Pb in paint and dust.

It is evident from the performance tests summarised in section 5.1 that none of the kits were able to meet the positive response criteria of the US EPA. A false positive is a test result that is positive for Pb when it is actually absent. However, according to the US EPA, a false positive is a test result that is positive for Pb, but the true value is below the selected Pb level (regulatory threshold for Pb paint: 1 mg/cm^2)¹⁵ (eCFR, 2025b). It is possible that Pb may be present below 1 mg/cm^2 and thus all results detecting Pb may not be true false positives. Therefore, it is very difficult to meet the US EPA's positive criterion. However, even at 0 mg/cm^2 Pb level, the test kits showed high false positive rates (>10%) when the measured Pb level was $<0.009 \text{ mg/cm}^2$ (Rossiter *et al.*, 2000). In contrast, performance tests with Lumetallix found no false negatives or false positives (Helmbrecht *et al.*, 2023).

¹⁵ Lead-based paint means paint or other surface coatings that contain lead equal to or exceeding 1 mg/cm^2 or 0.5 % by weight or 5000 ppm by weight.

7. CONCLUSIONS

It is well known that that houses and public buildings constructed before 1970 used Pb-based paints that can present human health risks due to deterioration (peeling, chipping, chalking, cracking) and subsequent human exposure. The traditional Pb testing kits/swabs (rhodizonate and sulphide based) are commonly used for initial screening for Pb detection, due to their convenience and affordability, allowing homeowners to quickly check for the presence of Pb. However, they generally produce high false positive rates. The three kits recognised by the US EPA are not available in New Zealand. Even these kits do not meet both of the full performance criteria set by the US EPA.

Given the limited availability of the Pb testing kits and the performance limitations of currently available products, it is advised to be vigilant for new products or detection methods that are being developed and could meet performance criteria set by the US EPA. The Lumetallix instant Pb detection kit is one the new Pb testing kit that is reported to give no false positives and false negatives in performance tests.

Hand-held XRF analysers provide a more reliable approach to field testing for Pb, however, these instruments are much more expensive than test kits.

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