

# INSTRUCTIONS FOR ALL PRECIOUS METAL TESTERS BY QUICKTEST AND TROYTEST

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	Needle file (for removing any surface plating)	✓	✓	✓	✓	✓
	Magnet * pull it out to use	✓	✓	✓*	✓*	✓*
	Screwdriver to lock the box. Sample of copper.			✓ ✓	✓ ✓	✓ ✓
	Reminder chart (plastic disc) – use in conjunction with the instructions. Book of test-papers. Strips of polishing paper.				✓ ✓ ✓	✓ ✓ ✓

**DISCLAIMER** All testers must be used in conjunction with the user's skill, knowledge and experience. Under no circumstances shall the manufacturers or any of its distributors be liable for direct or indirect loss sustained in connection with any item. It is your responsibility to check the reactions against known samples.

## BEFORE YOU START

Using testing acids requires a steady hand and good eyesight, so if you need to find your reading glasses or a magnifier, do so before you start. You must work on a stable flat surface in good light. After each test mop up the spot of acid up with tissue, so have a tissue ready before you start. Wear acid-proof gloves (nitrile recommended).

**Plastic bottles** Before first use, remove the shrink-seal and tape, you will have to do this without wearing gloves – then put the gloves on. have a childproof cap. Upon first use, push down very firmly and twist to the left (a tamper-proof seal will break). When replacing the cap press downwards as you tighten it otherwise it will leak.

**Glass bottles.** do not have childproof caps, keep them well away from children, store them in the box, lock the box.

## SUMMARY

Before you use acids, check for the obvious: is it yellow or white? When filed (file supplied) it, is it yellow or white underneath? When you file it, is it so hard that it can't *possibly* be gold or silver? Is it magnetic? (magnet supplied) - gold and silver are not magnetic.

- 1) Is silver? Use the **AMBER** acid (with *Quicktest-1/silver and all sets*), **page 4**
- 2) Is it 9ct gold? *Always start with the WHITE acid (with Quicktest-1/gold and all sets)*, **page 3..**
- 3) If it's gold, and better than 9ct, use the **BLUE** acid (with *Quicktest-3 (3-bottle) and Troytest 4-bottle sets*) to test for 14ct, 18ct, 22ct or 24ct, **page 4.**
- 4) If gold, better than 9ct and *white*, use the **GREEN** acid (with *Troytest (4-bottle) and Troytest-5-(5-bottle) sets*), to see if it's white gold, steel, platinum or Palladium, **page 5.**
- 5) A double-check on 9ct readings which are inconclusive, use the **CLEAR** acid (*Troytest 5-bottle set*), **page 6** to check for 8ct and for an unusual alloy of 9ct that contains a lot of zinc. with

## PREPARATION AND APPLICATION

**Wear protective acid-proof gloves** because acid burns!

**There is a magnet** in the wooden box, pull it out to use it. Gold and silver are not magnetic.

**File the item** with the file. A needle-file is supplied so that you will only file a tiny area (do this in a place that won't show) - but file firmly to be certain to remove any plating.

### APPLY THE ACID

**Plastic bottle:** turn it upside down, *gently* squeeze, apply one drop of acid to the filed area of the metal. Do not squeeze hard, you will squirt acid! Have a tissue ready to catch any drops that spill. After each use, mop up the acid from the item and also mop up any acid from the outside of the nozzle.

**Glass bottle:** in addition to gloves you may wish to wear goggles. Unlike a plastic bottle, a glass bottle can fume noticeably, do not breathe the fumes. Replace cap when not in use, or you could spill the entire contents. There is an applicator in the lid, use the edge to apply larger drops, use the tip to apply smaller drops. After the test mop up the acid with tissue.

## **THE WHITE (9ct) ACID** **to test for** ***not gold / 9ct / better than 9ct***

You will find this acid in the QUICKTEST-1 / GOLD tester and all QUICKTEST and TROYTEST sets

**\*\* When testing yellow metals always start with this bottle \*\***

**Not gold: acid turns a vivid green.** It froths spectacularly in 1 to 3 seconds (if it's very quiet you will hear it fizzing). Try it on the sample of copper.

### **9ct: acid turns dark<sup>1</sup> over a period of a few seconds**

This 'period' varies, depending on the mixture (alloy) of 9ct, it also varies in extremes of temperature. At room temperature and for most alloys: **3 to 10 seconds**, but don't worry if this is 2 or 3 seconds quicker or 3 or 4 seconds longer, it's the 'turning dark' that is important.

Sometimes it is obvious that the acid has turned dark, sometimes not so obvious. Turn the item so that you are looking at the top of the acid against the light (instead of looking straight down at the metal): the acid will appear dark. By contrast, 'clear' is completely clear, crystal clear, like water, no matter how it is viewed.

The acid can slowly turn green and bubble on 9ct if left for too long (wipe it off the moment you have observed the reaction) but nothing like the reaction on brass or copper, try it out on the sample of copper.

All reactions become slower over the weeks and months as the acid becomes weaker (by the "use by" date it will be getting very weak).

**Better than 9ct:** acid remains clear (as if it were water)

If it is better than 9ct, this acid will not tell you how much better it is - move onto the *blue acid (14ct-24ct)* acid.

### **White metals**

If it turns green and fizzes, it is not gold. However, it gives any other reaction, the result is inconclusive: use the *amber* acid to test for silver and/or the *green* acid to test for steel / platinum / Palladium.

**TIP:** if the metal is magnetic it cannot gold or silver. Being magnetic doesn't prove it's white gold, steel, many varieties of steel (of which there are hundreds) are not magnetic.

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<sup>1</sup> A charcoal-grey slightly greenish colour (opinion varies) - "dark" covers all possibilities.

## THE BLUE ACID

### to test for 14ct - 24ct (yellow metals)

You will find this acid in the QUICKTEST 3-bottle set, and TROYTEST 4-bottle and 5-bottle sets

The acid will change colour over a short period, this varies, depending on the gold mixture (alloy) but it *will* be obvious as to whether it is 'a few seconds' or 'several seconds' or 'a minute or two'. The reactions get slower over the weeks and months as the acid gets weaker, by the "use by" date it will getting very weak.

#### **14ct acid turns dark quickly, over a period of a few seconds**

The reaction can be as quick as 1 to 2 seconds or as slow as 3 to 6 seconds. When fresh it *will* (after going dark) turn green and will bubble.

**18ct acid gradually turns yellow\*** - usually in 4-8 seconds, but can be as quick as 3-5 seconds or as slow as 10-15 seconds, The important factor is that it turns yellow, and that it does this quite quickly, in a few seconds.

**22ct acid turns yellow\*** slowly, over several seconds, from 15 to 30 seconds, to 30 to 50 seconds depending on the strength of the acid.

**24ct acid turns yellow\*** very slowly, over a period of 1 to 3mns

\* it's a light green-ish yellow, the exact shade really isn't important, if you are colour blind all you need to know is: it's a *light* tone.

## AMBER ACID, TO TEST FOR SILVER

You will find this acid in the QUICKTEST-1/SILVER tester and all QUICKTEST and TROYTEST sets

The acid must touch the filed area only, if it touches any silver plating, the reading can indicate SILVER in error.

- acid remains amber                      not silver
- acid turns very pale red   low grade silver (approx. 800 parts per thousand)
- acid turns deep red      Sterling silver (925 parts per thousand)

#### **For the colour blind:**

Amber                      a pale translucent colour

Very pale red      a wishy-washy pale tone as if poorly-painted from a child's paint box

Deep red                      a vivid 'deep' tone (quickly turning very dark)

## GREEN ACID

**for testing white metals: white gold, platinum, Palladium, steel**

You will find this acid in the TROYTEST sets (4-bottle set or 5-bottle set)

*Important:* first check that the metal is not 9ct gold (the WHITE acid turns dark) or silver (the AMBER acid turns red).

Apply the *blue* acid to the metal, *allow plenty of time for the acid to change colour*, soak up the spot of acid with test paper.

Then add a drop from the Green bottle *to the stain on the paper*.

The chart below shows the reactions. You will notice that:

- there is no reaction listed for 22ct to 24ct because this test is for *white* metals, and high-carat gold (22ct+) can only be yellow.
- on steel (there are *hundreds* of varieties) the *blue* acid can turn any shade of yellow or green and may or may not bubble - this is why you cannot test white metals with the blue acid alone.

If you are colour blind: *yellow* is a light tone; *reddish / dark red* are dark colours but not quite black, and *black* is black. When you add the GREEN acid to the stain on the paper it's easy: *black, black-and-blotchy* or *clear*.

Metal	Colour of acid on metal	Colour of stain on paper	Colour when the acid is added to the stain on paper
<b>14ct-18ct</b>	Turns dark or turns yellow, same reactions as for yellow gold.	From greenish / yellowish-green, to yellowish, to very light yellow (the higher the carat the lighter)	Dark. Lower carats <i>tend</i> to go black-blotchy, higher carats <i>tend</i> to go completely black
<b>Platinum</b>	Clear	Clear	Clear
<b>Steel</b>	From yellowish to bright yellow to greenish; it may or may not bubble; it might leave behind greyish stain	Yellowish-green	Bleaches out (goes clear)
<b>Palladium</b>	Reddish, rapidly turning dark red and bubbling.	Red-ish	Black (very dark)

## **CLEAR ACID, TO TEST FOR 8ct, and 9ct/zinc**

Use this bottle only if the 9ct bottle is giving inconclusive readings  
(some people call this the “9ct re-test” bottle)

You will find this acid in the TROYTEST 5-bottle set

Clean the metal very thoroughly before applying the acid.

It will

- remain clear on most 9ct
- show slight clouding on high-zinc 9ct
- just *start* to turn dark (some say, “white/grey”) on 8ct
- turn dark on copper.

TIP: if the item has a British hallmark (and you recognise the hallmark to be genuine) test the hallmarked tab/link part using the *WHITE (9ct) ACID*, then test another part of the item. If both give exactly the same reaction it's 9ct, no need to use the *CLEAR* bottle.

## **IMPORTANT SAFETY INFORMATION**

**Keep bottles upright at all times, store them the box, keep them away from children (lock the box), and keep them away from extreme heat**

### **AVOID EXPOSURE**

**“Exposure” means the chemical gets on or inside your body. Avoid exposure from spillage: wear protective acid-proof gloves, Avoid exposure from fumes: use in a well-ventilated place.**

### **IN CASE OF ACCIDENT:**

**GENERAL:** Use and store in a well-ventilated place away from extreme heat. If split on fabric or furniture soak with water (plus bicarbonate of soda if readily available). May be corrosive to metals.

**MEDICAL:** The following advice concerns *exposure*, i.e. if chemical gets inside your body. Avoid exposure, wear gloves, do not breathe fumes, use in a well-ventilated place. Can cause severe skin burns and eye damage. Toxic if inhaled. If exposed or concerned, seek medical advice.

**If inhaled** remove to fresh air, keep comfortable for breathing, call POISON CENTRE/doctor.

**If in eyes** rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing and call a POISON CENTRE/doctor.

**If on skin (or hair)** remove contaminated clothing,<sup>1</sup> rinse skin with water under a tap or shower.

**If swallowed** call POISON CENTRE/doctor. Rinse mouth.

### **THE ACIDS**

NITRIC HNO <sub>3</sub>	EC 231-714-2
HYDROCHLORIC HCl	EC 231-595-7
SULPHURIC H <sub>2</sub> SO <sub>4</sub>	EC 231-639-5



### **THE ADDITIVES**

The following concerns the additives in their 'neat' form as a powder. You don't have access to the powder, it is dissolved in acid (follow *IN CASE OF ACCIDENT* above) but here is the safety data anyway.

**GREEN ACID (white metal)** contains tin chloride SnCl<sub>2</sub> **EC 231-868-0**  
May cause respiratory irritation; harmful if swallowed; may cause damage to organs (cardio-vascular system) through prolonged or repeated exposure.

**AMBER ACID (silver)** contains chromium trioxide CrO<sub>3</sub>. **EC 215-607-8**  
May cause fire or explosion; strong oxidizer. Toxic if swallowed or in contact with skin. May cause an allergic skin reaction; may cause allergy, asthma symptoms or breathing difficulties if inhaled; may cause respiratory irritation<sup>2</sup>. May cause genetic defects; may cause cancer; suspected of damaging fertility<sup>3</sup>. Very toxic to aquatic life with long lasting effects. Keep away from heat. Do not breathe fumes<sup>2</sup>.

**CLEAR ACID (8ct / zinc alloy)** contains silver sulphate AgSO<sub>4</sub> **EC 233-653-7**  
Causes serious eye damage. Same advice as for acids, above.

<sup>1</sup> Any fabric against the skin that is *soaked* in acid must be removed or the acid will continue to burn through the skin. One drop won't burn through thick fabric / layers of clothing.

<sup>2</sup> The powder is dissolved in acid so you cannot inhale it. Also, this particular acid does not fume so it would be difficult to "breathe" it. However do not deliberately sniff it.

<sup>3</sup> All these effects were found when chromium trioxide (in its neat form as a powder) was given to rats in large quantities. It is unknown if it has the same effect on humans.

## CHEMICALS: SUMMARY FOR MEDICS

Maximum spill from a glass bottle, 5ml.

Spillage from plastic bottle (from dropper) 0.003ml per drop.

### WHITE ACID (9ct)

Acid: nitric  $\text{HNO}_3$

EC 231-714-2



### BLUE ACID (14-24ct)

Acid: Nitric  $\text{HNO}_3$

EC 231-714-2

Acid: Hydrochloric HCL

EC 231-595-7



### AMBER ACID (silver)

Acid: Nitric  $\text{HNO}_3$

EC 231-714-2

Additive: chromium trioxide  $\text{CrO}_3$

EC 215-607-8



### GREEN ACID (white metal)

Acid: hydrochloric HCL

EC 231-595-7

Additive: Tin chloride  $\text{SnCl}_2$

EC 215-689-5



### CLEAR ACID (8ct / zinc)

Acid: nitric  $\text{HNO}_3$

EC 231-714-2

Acid: sulphuric  $\text{H}_2\text{SO}_4$

EC 231-639-5

Additive: silver sulphate  $\text{SnCl}_2$

EC 215-689-5



## DISPOSAL

If you have old acid bottles, destroy any remaining acid.

Go to a sink, turn on the taps, then:

### Plastic bottles

Gently squeeze any remaining acid into the flowing water. Then tip the end into the flowing water, squeeze, let go, water will be sucked up; squeeze it out into the flowing water, repeat three or four times. The bottle is now clean and can be thrown away.

### Glass bottles

Gently tip any remaining acid into the flowing water, then rinse out the bottle. Very gently rinse out the cap, taking care not splash. The bottle is now clean and can be thrown away.

## DISCLAIMER

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