Hi guys.

Here is a small picture documentation of the rusting of a tank - INSIDE!

Method :

A First loosen the coarse rust in the tank to the last corner using an old concrete mixer.
Disassemble the tank cap and fuel tap
Rubber plugs in the filler neck / neck of the fuel tap too
Fill the tank approx. 1/4 to 1/3 full with "grinding material / grit" like glass, steel balls etc. (everything has to be really small so that even the tightest corners can be reached) and start the mixer.
You can simply firmly attach the tank to the front of the mixer drum or modify the mixer, as can be seen in the following pictures, and then connect the tank.
While the mixer moves the tank, also move the large "handwheel" so that the tank changes its "position" and the "grit" also comes into the last corners.
Pour out the "grit" and vacuum out the tank thoroughly with a vacuum cleaner.

B chemicals:

1. 30% hydrochloric acid (1 liter)
2. phosphoric acid (1 liter)
   2a. - 70% technical acid (on ebay etc.)
   or
   2b. - 30% "orthophosphoric acid" (pharmacy?).
3. Spirit or acetone (1 liter) ... for cleaning.

First pour the hydrochloric acid into the tank .. with great caution ..
Safety glasses and rubber gloves are a top priority.
In addition, please do not work indoors - only outdoors / in a well-ventilated place.
The hydrochloric acid gases are very corrosive ....
I closed the tank cap with a rubber "rag" and an old wheel bearing cap from the Golf 1.
I closed the metric connecting piece of the petrol tap (Z 900 tank) with a rubber seal and a standard aerator for a tap.
Possible connections for overflow or ventilation must of course also be tightly closed.
The tank can then be turned and shaken in any direction.

Let the hydrochloric acid act for approx. 20 min.
Distribute into all "corners" by shaking by hand.

IMPORTANT :
Always check to what extent the rust has already dissolved.
AND - Always remove the filler plug and let the gas pressure escape.
If there is no rust left, remove hydrochloric acid.
Never leave the hydrochloric acid in the tank for too long (could cause holes!)

Then rinse briefly with water and clean with the liter of acetone.

Now phosphoric acid is used. (also the whole liter in)

This should seal the surface (passivate) and bind the remains of hydrochloric acid droplets (if there is still some hydrochloric acid in the tank)

Let the phosphoric acid act for a good two hours.

Always shake well and often.

Finally, drain off the phosphoric acid and allow the interior of the tank to ventilate in the fresh air. (about a sunny day - but in the shade!)

Under no circumstances rinse!

rust removal - Done.

Another Tipp :

For storage well with e.g. Acid-free WD 40 (or Ballistol gun oil) mist the interior of the tank and plug the filler as well as the fuel tap nozzle with a cloth soaked in oil.

Do not forget :

Before using the tank for the first time, rinse it well with a few liters of petrol.

Or :

Fill up with ethanol-free gasoline to the brim and place it on the shelf with the gasoline tap and fuel cap closed.

Greetings Achim

PS:

All chemicals do not simply belong in the environment, but must be disposed of separately! They are all highly toxic.

Reaction equations .:

Rusting iron = iron oxide:

Iron II, oxide and iron III oxide (Fe_2O_3 or Fe_3O_4)

Now plus HCl (hydrochloric acid):

$Fe_2O_3 + 6HCl \rightarrow 2FeCl_3 + 3H_2O$

In the second process, phosphoric acid prevents the attack of oxygen on the iron (passivation of iron)

This iron phosphate layer (phosphating metal) is not porous, like rust (mixture of different iron oxides), but is solid, durable and can even be painted (but not with water-soluble paints).

Now the phosphoric acid: H_3PO_4 ... (using the example of iron II oxide)

$H_3PO_4 + FeCl_3 \rightarrow Fe(PO_4)_2 + 3HCl$ (the HCl forms a compound with phosphorus)

$H_3PO_4 + 5HCl = PCl_5 + 4H_2O$

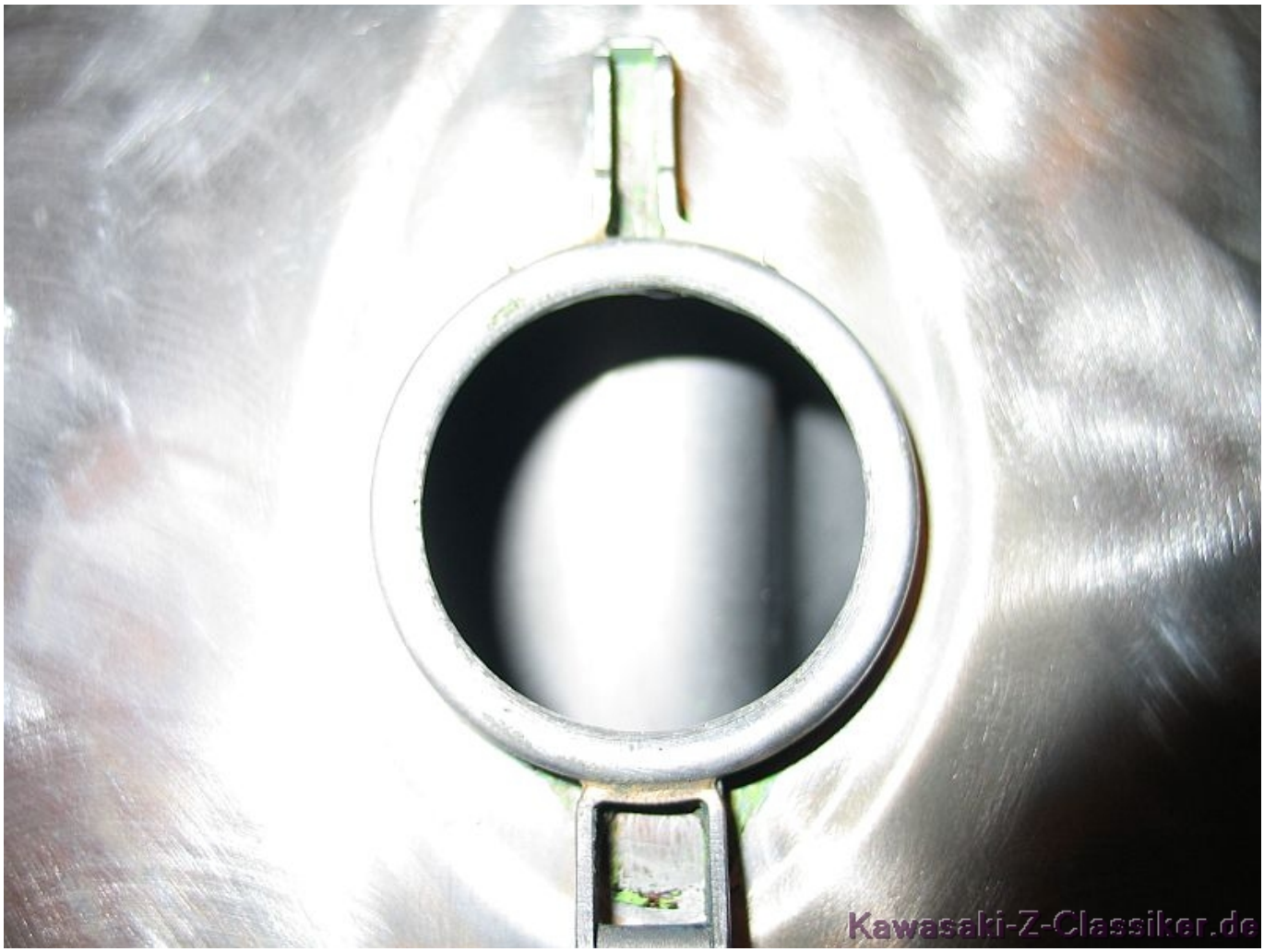
PCl_5 = phosphorus chloride

Fe_2PO_4 = iron phosphate.

The moded mixer with the tank wrapped in thick blankets because it was painted and firmly bound.

View into the tank neck - before rust removal

View into the tank neck - after rust removal and passivation
(Paint from the outside also “off” - should be repainted)



The chemicals