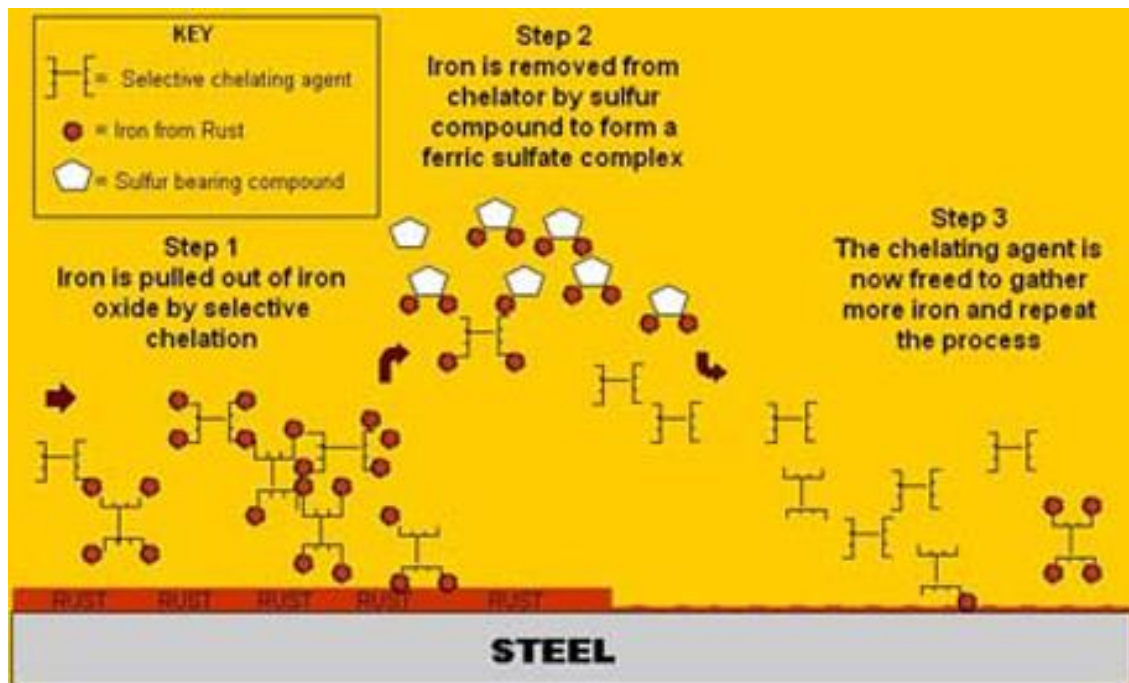




Non-harmful rust remover  
Environmental Friendly  
Non Corrosive

## FREQUENTLY ASKED QUESTIONS

Q-01) How does RUST COMBAT work?



A) RUST COMBAT® works through selective chelation. This is a process in which a large synthetic molecule forms a bond with metals and holds them in solution. Most chelating agents bind many different metals. The active ingredient in RUST COMBAT® bonds to iron exclusively. It can remove iron from iron oxide but is too weak to remove iron from steel where the iron is held much more strongly. Once the chelating agent has removed the iron, a sulfur bearing organic molecule pulls the iron away from the chelator and forms a ferric sulfate complex which remains water soluble. This frees the chelating agent to remove more iron from rust.



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**Q-02) Do parts have to be completely clean before immersion?**

A) No. RUST COMBAT® has detergents which penetrate oils and dirt. However, surface contaminants do slow the process. The soils must be penetrated before RUST COMBAT® can come in contact with the rust underneath. Soil residue will also shorten the life of RUST COMBAT®. Heavy greases and cosmoline should be removed prior to de-rusting.

**Q-03) Will RUST COMBAT® remove bluing and other oxide finishes?**

A) Yes. RUST COMBAT® will remove these in about 30 minutes. Anodizing will not be removed. Powder coating and paint will not be removed as long as the paints do not contain oxides.

**Q-04) Can I clean brass, copper and aluminum with RUST COMBAT®?**

A) No, it will not clean or damage any of these metals. It will not harm rubber, plastic, clothing or glass either.

**Q-05) I get a black film on some parts after using RUST COMBAT®. What is it and how do I remove it?**

A) The black is carbon from the steel. Generally high carbon steel is used in making items that are flexible (e.g. springs, saw blades) High carbon steel and tool alloy steel items when de-rusted will have a darker appearance. Much of the carbon can be removed simply by wiping with a cloth.

**Q-06) Can I spray RUST COMBAT® on the rusted area?**

A) No, RUST COMBAT® only works in the liquid form. When sprayed on a surface, the water in the solution will evaporate before de-rusting can be completed.

**Q-07) How can I use it on a surface too large to soak?**

A) A smooth paper towel can be soaked with RUST COMBAT and applied to the rusted area. After this is done, cover with plastic to prevent evaporation. When item is de-rusted rinse with water.





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**Q-08) How long does RUST COMBAT® last?**

A) 4 liters of RUST COMBAT® will remove the rust from 135 kgs of moderately rusted steel. If any of the bath evaporates, simply replace it with fresh tap water.

**Q-09) How do I know when the bath is spent?**

A) The bath will turn completely black and will not perform. Also the specific gravity will change from 1.042 to 1.085.

**Q-10) How do I dispose of the spent solution?**

A) When RUST COMBAT® is spent, only the iron content of the solution will dictate how it can be disposed of. In most cases it can be dumped into the city sewer.

**Q-11) What size containers is RUST COMBAT® packaged in?**

A) It comes in 1 liter can, 4 liters can, 20 liters pail, 200 liters drum and 2000 liters IBC drum.

**Q-12) How long will RUST COMBAT® last, and how many times can it be re-used?**

A) RUST COMBAT has an indefinite shelf life.

The product can be re-used until its effectiveness starts to wear off. In general, 4 liters of RUST COMBAT® will remove 225 grams of pure dry rust, which equates to approximately 135 kgs of moderately rusted steel. Since rust is 1/17th the weight of iron, the workload is quite substantial.

In terms of a degradation curve, RUST COMBAT® has a specific gravity of 1.042 when the solution is fresh. After repeated uses, the solution will darken and start to lose its effectiveness. Once the solution reaches a specific gravity of 1.08, the solution will no longer be effective and should be replaced.



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**Q-13) After soaking metal in RUST COMBAT®, is any further treatment required?**

A) No further treatment is required once the rust has been removed with RUST COMBAT®. In some cases, residual rust may still be embedded in the metal (pits, crevices) after the initial soaking. In this case, rinse the metal with water and re-soak in RUST COMBAT®. All residual rust will be removed from these hard to reach places. It is important to always rinse the metal after a treatment with RUST COMBAT®. Tiny molecules of iron will still be embedded in the RUST COMBAT® solution, and these molecules must be rinsed off with water or they will activate the re-formation of rust on the metal object.

**Q-14) The process for removing rust with RUST COMBAT® is through a soaking of the rusted metal. Are there any other ways to use the solution to remove rust, such as painting or brushing the solution on the rusted area ?**

A) The recommended way, and the most effective way, of using RUST COMBAT® is through soaking the rusted surface. The liquid must remain in full contact with the rusted area for a period of time without evaporating.

**Q-15) How can I use RUST COMBAT® on an area that is difficult to soak?**

A) Soak a thick paper towel with RUST COMBAT® and then place it over the rusted area. Make sure the soaked paper towel conforms to the shape of the object to be de-rusted. For heavier rust, cover the soaked towel with the plastic wrap and tape the wrap down to prevent moisture from escaping. After an appropriate period of time, remove the soaked towel and rinse the area with water. The paper towel must remain soaked with RUST COMBAT® for this method to work effectively.



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### **Q-16) Can I spray RUST COMBAT® on the rusted area?**

A) RUST COMBAT® works best when the rusted item is completely immersed in the liquid solution. When RUST COMBAT® is sprayed on a deeply rusted surface, the water in the solution will evaporate long before the de-rusting can be completed. However, if there is light rust on a flat surface area (e.g. appliances, countertops, etc.), then spraying or wiping on RUST COMBAT® solution can work very effectively. Spray or wipe on the solution generously. The longer the contact time, the better will be the results.

### **Q-17) I got a black film on some parts after using RUST COMBAT®. What is it and how do I remove it?**

A) The black film is carbon from the steel. Steel is composed of a combination of carbon and iron. In certain instances, steel will darken in color after rust has been removed from the surface of the metal. This is a natural phenomenon that chemists refer to as “carbon migration”. The carbon from the steel moves, or “migrates”, to the outer layer of the metal and settles into the pores. The removal of the rust (iron oxide) reduces the proportion of iron to carbon, leaving a higher concentration of carbon on the outer surface. This heavier layer of carbon could cause a darkening of the metal due to the attributes of the carbon. The darkening does not have an adverse effect on the metal. It merely represents the movement of carbon from the interior of the metal to the exterior of the metal.

Since RUST COMBAT® is a highly effective rust remover, it stimulates the carbon migration process. RUST COMBAT® is not alone in creating the carbon migration effect. Other rust removal treatments will also result in carbon migration and a darkening of the metal. The primary difference between RUST COMBAT® and the acid based treatments is that RUST COMBAT® will not harm or weaken the metal. Unlike other treatments, RUST COMBAT® will not darken products made with low carbon steel.

With RUST COMBAT®, sometimes a wiping with a dry cloth or a more rigorous buffing can remove the dark coloring. A quick rinsing of the metal after RUST COMBAT® has been applied may also keep the carbon from settling into the pores of the metal.

There are several things that can be tried to minimize the effects of carbon migration. First, high carbon parts should not be soaked longer than necessary. Once the rust has been removed, the



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parts should be rinsed and dried. Second, a further dilution of the RUST COMBAT® formula may have a positive affect. The lower concentration of RUST COMBAT® will take longer to remove the rust, but may have less of an effect on causing the carbon migration.

### **Q-18) How do I use RUST COMBAT® in a cooling system?**

A)

1. Drain cooling system and rinse with water.
2. Fill system with RUST COMBAT®. (Do NOT dilute.)
3. Run Engine under normal conditions, shut engine down and let sit, for a couple hours to overnight.
4. Drain system into a container for later use.
5. Flush system with water.
6. Repeat process (1-5) if necessary.
7. Fill system with proper coolant/antifreeze.