



Application Guide for ZRC, GALVILITE and ZRC-221 Galvanizing Compounds

Unlike many other coatings on the market, ZRC Worldwide's line of solvent-based, single-component zinc-rich coatings are very easy to use and apply. The following describes the proper steps needed to ensure world-class corrosion protection for your iron and steel:

PREPARATION:

The very definition of galvanizing requires the electrical coupling of the metal substrate with the zinc of the coating. So, for our ZRC Galvanizing Compounds to be effective, they need to be applied directly to a clean, bare and dry metal surface. For proper surface preparation, please refer to our "Guide to Surface Preparation".

Since our ZRC Galvanizing Compounds consist of only one-component which contains a very high level of zinc, they will require proper homogenization upon opening (we also highly recommend continual or frequent agitation of our products during use to avoid settling). To easily mix the coatings, we recommend the use of a portable variable-speed drill (preferably rechargeable battery powered) fitted with a mixing blade similar to those pictured below. Begin mixing at slow speed to avoid spilling or splattering of the product.



Proper
Mixing
Blades:

ZRC Galvanizing Compounds can also be mixed by hand using metal spatulas, wooden stirring sticks or paint shaking machines (provided they are made to handle the high weight of our products (please refer to the machine manufacturer's printed specifications). Whichever method is used, mix the coating until it is thoroughly homogenized.

APPLICATION: ZRC Galvanizing Compounds can be applied by brush (100% Chinese Bristle), 3/8 " nap roller (natural mohair or lambswool (sheepskin)), air spray and airless spray. The following pages describe the application of these products using spray techniques.



145 Enterprise Dr., Marshfield, MA 02050

Tel: (781) 319-0400

Fax: (781) 319-0404

Web: www.zrcworldwide.com

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SPRAY APPLICATION:

The purpose of this guide is to relay practical information for the successful application of ZRC products by the spray technique. We have focused on the two most popular forms of spray application, namely conventional air and airless, and have left other exotic methods, such as hot spray, hot airless and electrostatic, to more definitive texts.

ZRC products can easily be applied by the spray technique. Periodically, spray difficulties are reported, but these generally stem from a misunderstanding of how to use ZRC properly or the use of inappropriate equipment. Hopefully, this guide will dispel the apparent mystery.

CONVENTIONAL AIR SPRAY APPLICATION:

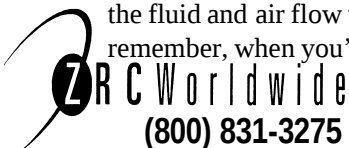
We find this application method to be used most frequently for small piecework or parts with intricate detail where high film builds must be avoided. In fact, its number one claim to fame, in our opinion, is the level of control an experienced applicator has over the film build and spray pattern.

The necessary pieces of equipment for conventional air application are a compressor, pressurized paint pot (preferably one with a constant agitation feature), material feed line, air pressure line and gun (Figure 1). A stream of ZRC is fed from the pressure pot through the material line under air pressure (typically 15-20 PSI Fluid Pressure) to the gun where it is atomized by a second stream of air pressure (typically 50 PSI). For very small jobs, many applicators replace the pressure pot and material line with a quart sized cup (you'll also need to change to an external mix air cap), which attaches directly to the gun (you may see this set up in an auto-body repair shop).

The gun (figure 2) is the real key to control. The fluid adjusting valve controls the amount of ZRC passing through the fluid tip (with ZRC, this valve will most likely be full open) and the pattern adjusting valve controls the air flow to the horns of the air cap, which adjusts the spray pattern. In addition, there is a wide variety of air caps, fluid caps and needles to choose from. For ZRC, use only fluid tips with a 0.080" orifice size or you may see a fair amount of wear and probable clogging.

Air spray delivers a much lower volume of ZRC than airless spray and requires the coating to be of lower viscosity. For ZRC or GALVILITE, this means that you will need to add solvent. We recommend that you use 1 part of a mineral spirits-based solvent with 4 parts ZRC or GALVILITE (by volume). In other words, use a quart of mineral spirits for a gallon of ZRC or GALVILITE. Alternatively, you may use Xylene (Xylol) at a ratio of a half -pint to a gallon of ZRC or GALVILITE (1:16 ratio). ZRC-221 may be reduced by the addition of parachloro-trifluoromethyl-benzene (PCTFB) at a maximum ratio of 1 part PCTFB to 5 parts ZRC-221 (by volume).

So, basically, you thin the ZRC coating (if necessary), pour it into the pressure pot or cup (constant agitation is highly recommended to avoid zinc settling), close the pot, adjust your pressures using regulators, pull the gun trigger, adjust the fluid and air flow with the appropriate valves and you're off to the races! It really is that easy! Also, please remember, when you're finished spraying, to clean the equipment and flush all lines using solvent.



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AIRLESS SPRAY APPLICATION:

Airless spray is most often used for large jobs where there are lots of flat surfaces. It's a lot faster than conventional spray because it delivers a whole lot more ZRC to the metal surface, thereby increasing the production rate by a factor of at least 4!

The term "Airless" does not mean that you do not need a compressor: you do. The compressor-supplied air is used to drive a pump which magnifies the pressure many times to force a stream of ZRC (at up to 4000 PSI) through some very small orifices, atomizing it and propelling it toward the metal surface. The compressed air is not used to directly atomize the coating as in conventional air spray.

The equipment needed for airless spray is a little more involved than conventional (Figure 3). In addition to the compressed air line, you need an airless pump, pick-up tube, material line and airless gun.

Let's first discuss the "meat" of the operation – the pump. Of utmost importance is the "ratio" of the pump. For every pound of pressure put in from the compressor, the pump magnifies it by the ratio. For example, if you supply 100 PSI of compressed air to a 30:1 ratio pump, you will have 3000 PSI delivered at the gun (100 x 30). For ZRC Galvanizing Compounds, pumps lower than 30:1 don't give enough pressure magnification for proper atomization. Pumps greater than 30:1 are overkill and more expensive.

The pump assembly also has packing glands and a filter. We strongly recommend the use of Teflon packings and complete removal of the filter screens. Check with your pump's manufacturer to determine the existing packing material and replace with Teflon, if possible, to avoid undue wear. When using our single-component organics, don't worry about the filter – we've already filtered the products for you. Leaving the filter in could cause clogging. Also, make sure that there is a pressure relief valve on the bottom of the filter housing. Without this relief valve, you've got a big problem. If, for any reason, you should experience a clog, you will need to release the pressure built up in the lines (could be up to 4000 PSI) to correct the situation.

Next is the gun (Figure 4). Unlike the conventional spray gun with its multitude of adjustments, the airless gun is very simple – there are no adjustments possible. The gun sprays "Full On" all the time that the trigger is pulled. This makes it a little difficult for applicators used to conventional guns since you cannot "feather" the edges and your hand MUST be moving when you pull and release the trigger, or you'll see the most incredible runs and sags of your life!

Also, tip size and type are critical. For ZRC products, we recommend tungsten carbide (to prevent premature wear), reversing (necessary to clear clogs) tips with orifice size of 0.026". All hoses must be ½" ID Airless Type to avoid clogging and flow restriction. On a positive note, you now only need one hose (conventional spray requires two).

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AIRLESS SPRAY APPLICATION (CONTINUED):

So, now that you have the basic idea, let's start spraying. First, set up the system and flush it with solvent to clean the inside of the pump and the lines. Drop the pick-up tube directly into the ZRC product (note that there is no thinning required). Begin to raise the compressed air pressure using the air control on the pump while periodically triggering the gun. Once you have a nice, even-looking spray pattern (my experience says that this will be around 2000 PSI), stop raising the pressure and go to work.

When you're finished, turn off the pump and trigger the gun to relieve the pressure. Drain the ZRC product from the filter housing through the relief valve. Clean off the pick-up tube and flush the system with solvent.

Airless spray has many advantages, considering its efficiency, but it is much more dangerous than conventional spray for the inexperienced applicator. A friend of ours once wrote that "about the only way to hurt yourself with a conventional setup is to drop it on your foot". Airless is another matter altogether. Please follow these recommendations for your own personal safety:

1. Never put your finger (or any body part) in front of the tip and never point the gun at anybody. Paint at 3000 PSI can penetrate clothing, leather and skin, injecting itself into your person.
2. Airless hose is heavy. Don't tie it to your belt or sling it over your shoulder to relieve the strain.
3. If you see a pinhole in your hose, get rid of the hose! Remember paint escaping from a pinhole can cause you great discomfort.

A variation, air-assisted airless, reduces the atomization fluid pressures from 3000 PSI to 1000 PSI and improves control of the spray pattern. It adds airflow just outside the airless orifice and allows spray adjustment, just like conventional spray. The setup is the same as for airless, but an additional air line is added to the gun (Figure 5). The benefit: conventional air spray control with the production rate of airless.

FINAL COMMENTS:

This guide, in its limited format, is not meant to be a replacement for your equipment's owner's manuals, painting textbooks or the applicator's personal knowledge and experience. It is our hope that it will be viewed as an adjunct – offering tips specifically for the application of ZRC coatings. For further technical assistance, please contact ZRC Worldwide by telephone at 1-800-831-3275 or by e-mail at info@zrcworldwide.com.



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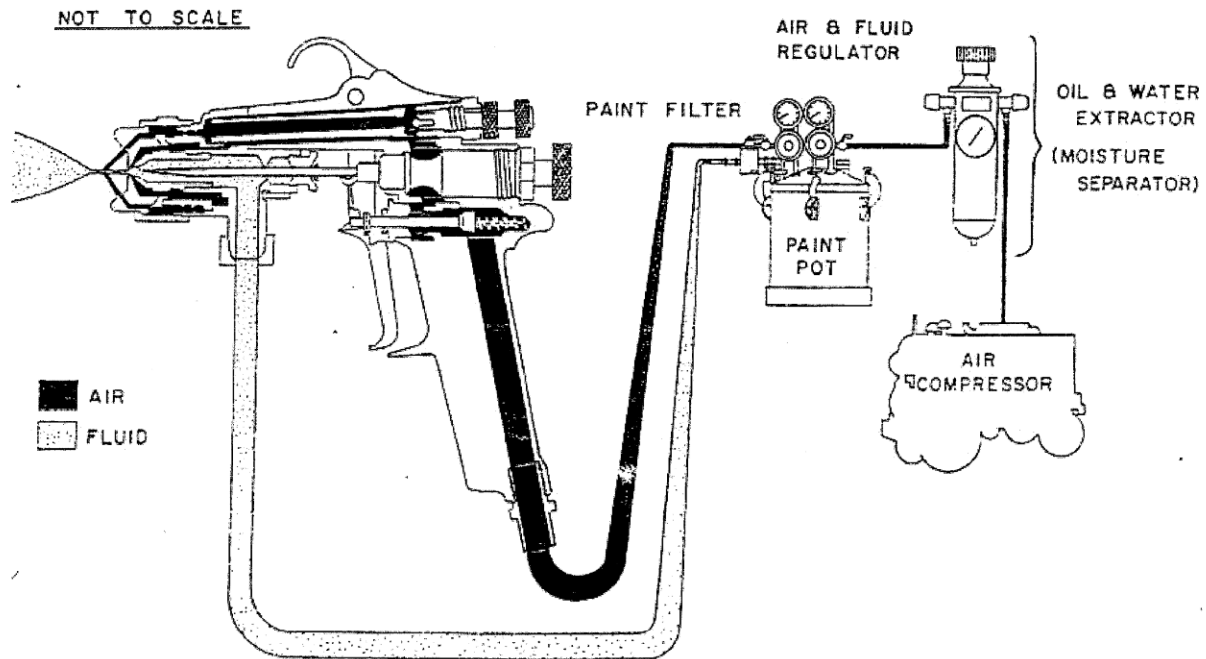


FIGURE 1. CONVENTIONAL SPRAY SET-UP

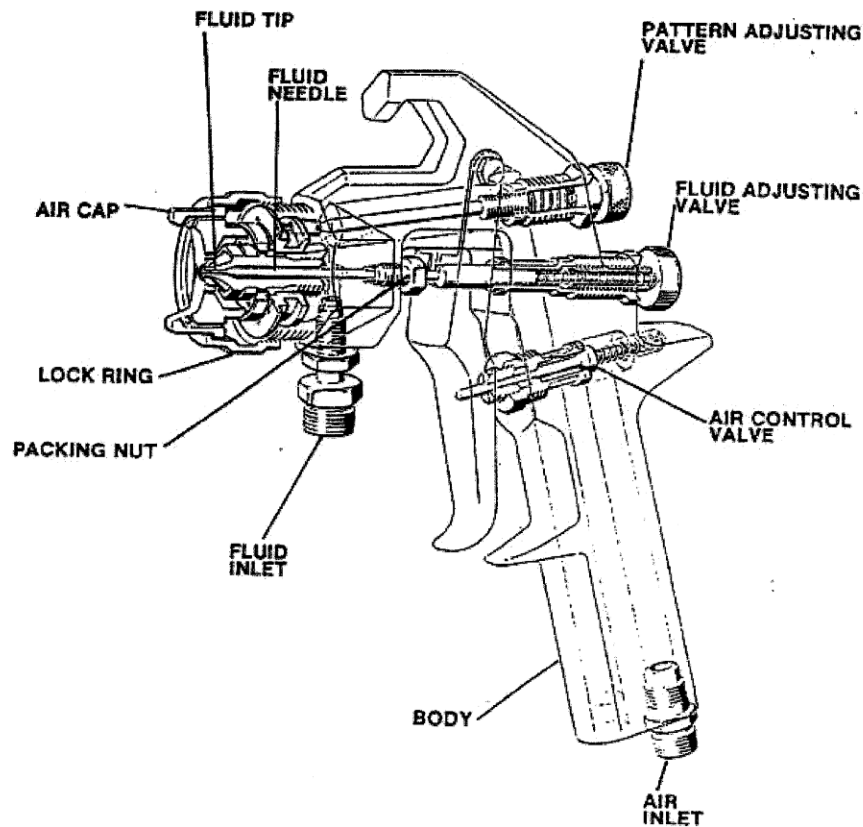


FIGURE 2. CONVENTIONAL SPRAY GUN

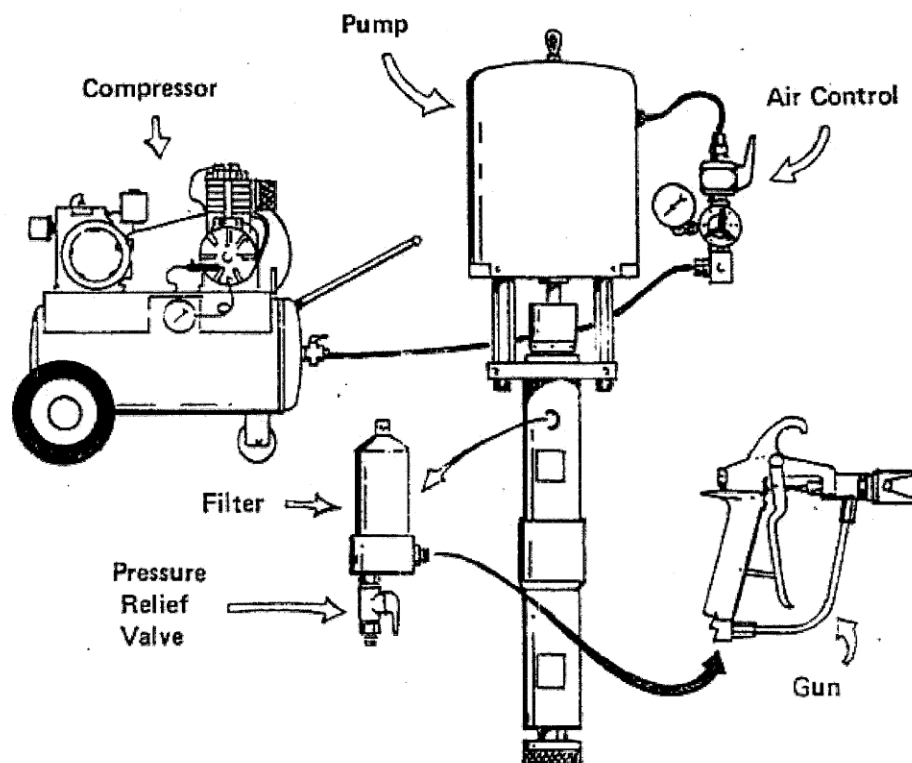


FIGURE 3. AIRLESS SPRAY SET-UP

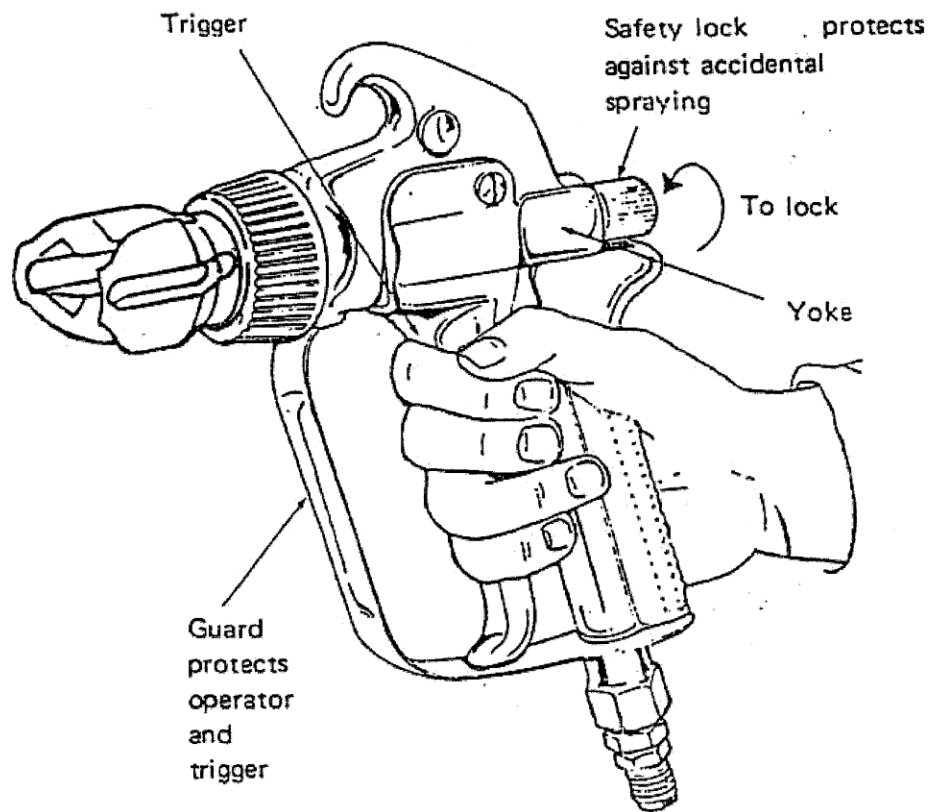


FIGURE 4. AIRLESS SPRAY GUN

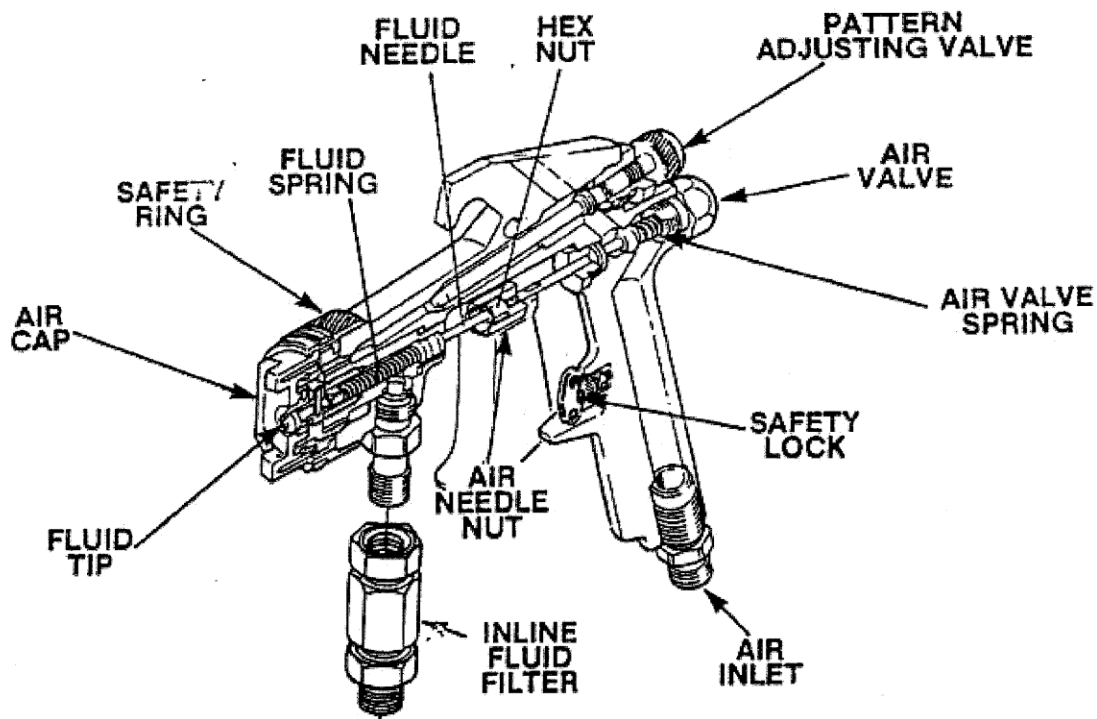


FIGURE 5. AIR-ASSISTED AIRLESS SPRAY GUN