

# TWT INC. RUST ERASE IRON FILTRATION SYSTEMS

## Air Birm Installation Guidelines – TWT-RE-30 & TWT-RE-50

### System Description:

- 1 Backwashable Birm Filters
- 1 Off Air Tank
- 1 U1020 PVC Air Injector Valve

Installation: Licensed plumber and/or contractor is recommended

### Basic Installation Guidelines:

Installer must first install the air injection valve. The Air Injection valve has 1" FT threads on either side for fast and easy installation. An arrow on the side indicates the flow of water through the air injection valve.

**Note:** The air valve must always be installed between the pump and pressure tank!

**Example#1**– If you are installing this on a submersible pump you would locate the air injection valve in the feed line (black poly) before the pressure tank.

**Example#2**– If you are installing the air injection valve on a jet pump you would locate this on the discharge of the pump before the pressure tank.

**Note:** Always have at least 12" of straight run on either side of the injection valve before elbowing to assure that the flow will not be disturbed passing through the air injection valve.

### Air Injector Setting:

You will find a set screw with a slot head for the adjustment of the air injection valve, which controls the amount of water flow through the venturi creating your air suction. Rule of thumb is that the air injection valve should be drawing in air for 1/3<sup>rd</sup> the running time of the pump. As the pump reaches pressure the air injection valve will not draw in any air, as the flow will be reduced as to when the pressure tank is in demand when it first starts up.

### Air Release Tank and Birm Filter:

Your air release tank is then installed after your pressure tank running the feed line into the top of the air release tank and out the out side located on the DI cap. Make sure the Braukmann valve is open during the installation. From there you will run the line into the backwashable Birm Filter and then the out back to your feed line to the house/facility.

### Pressure Settings and Requirements:

After the Iron Filter is installed, maximum performance pressure cut in and cut out pressure in the pressure tank should be set at 40-60 psi. 40 psi cut in and 60 psi cut out. To adjust this enter the pressure switch where you will find a small screw and a large screw. These are set screws, the smaller one adjusting the pressure differential between the cut in and cut out pressure. The large screws determines the pump cut in start time only. Recommended differential 20 psi as system will work at setting of 30-50 but for maximum performance should be adjusted to 40-60.

**Remember:** When adjusting pump cut in and cut out, the air pressure in the pressure tank must be adjusted to 2 psi below the cut time of the pump.

**Example:** Pump switch set at 40-60 psi – Air pressure in the Pressure Tank should be 38 lbs.

**Note:** All systems come with easy to follow illustrations, operational & installation manuals.



# BIRM

## Clack Birm® is a granular filter media commonly used for the reduction of iron and/or manganese from water supplies

Birm is an efficient and economical media for the reduction of dissolved iron and manganese compounds from raw water supplies. It may be used in either gravity fed or pressurized water treatment systems. Birm acts as an insoluble catalyst to enhance the reaction between dissolved oxygen (D.O.) and the iron compounds. In ground waters the dissolved iron usually in the ferrous bicarbonate state due to the excess of free carbon dioxide and is not filterable. Birm, acting as a catalyst between the oxygen and the soluble iron compounds, enhances the oxidation reaction Fe to Fe and produces ferric hydroxide which precipitates and may be easily filtered. The physical characteristics of Birm provide an excellent filter media which is easily cleaned by backwashing to remove the precipitant. Birm is not consumed in the iron removal operation and therefore offers a tremendous economic advantage over many other iron removal methods.

Other advantages of Birm include; long material life with relatively low attrition loss, a wide temperature performance range and extremely high removal efficiency. Negligible labor costs are involved because Birm does not require chemicals for regeneration, only periodic backwashing is required. When using Birm for iron removal, it is necessary that the water: contain no oil or hydrogen sulfide, organic matter not to exceed 4-5 ppm, the D.O. content equal at least 15% of the iron content with a pH of 6.8 or more. If the influent water has a pH of less than 6.8, neutralizing additives such as Clack Corosex, Calcite or soda ash may be used prior to the Birm filter to raise the pH. A water having a low D.O. level may be pretreated by aeration.

Additions of chemicals to influent or backwash water which contacts Birm media may inhibit iron or manganese removal or may break down or coat Birm media. Chlorination greatly reduces Birm's activity. High concentrations of chlorine compounds may delete the catalytic coating. Polyphosphates are known to coat Birm and reduce Birm's ability to remove iron or manganese. Before adding any chemical to the influent or backwash water, the chemicals compatibility with Birm should be thoroughly tested. Clack Birm may also be used for manganese reduction with the same dependability as iron removal. In these applications the water to be treated should have a pH of 8.0-9.0 for best results. If the water also contains iron, the pH should be below 8.5. High pH conditions may cause the formulation of colloidal iron which is very difficult to filter out. All other conditions remain the same for either manganese or iron removal.

### Advantages

- Under the proper conditions, no chemicals to purchase for maintenance. Regeneration not required.
- Iron removal efficiency is extremely high
- Negligible labor costs: only periodic backwashing required
- Durable material with a long life and wide temperature range
- Weighs only 40-45 lbs./cu.ft.

### Physical Properties

- Color: Black
- Bulk Density: 40-45 lbs./cu. ft.
- Mesh Size: 10 X 40
- Specific Gravity: 2.0 gm/cc
- Effective Size: 0.48 mm
- Uniformity Coefficient: 2.7

### Conditions for Operation

- Alkalinity should be greater than two times the combined sulfate and chloride concentration
- Maximum water temp. 100°F/38° C
- Water pH range: 6.8-9.0
- Dissolved Oxygen (D.O.) content must be equal to at least 15% of the iron (or iron and manganese) content.
- Bed depth: 30-36 inch
- Freeboard: 50% of bed depth (min)
- Backwash rate: 10-12 gpm/sq. ft.
- Backwash Bed Expansion: 20-40% of bed depth (min)
- Service flow rate: 3.5-5 gpm/sq.ft. intermittent flow rates and/or favorable local conditions may allow higher flow rates

### Influent and Backwash limitations

- Free chlorine concentration less than 0.5 ppm
- Hydrogen Sulfide should be removed prior to contact with Birm media
- Oil: None present
- Polyphosphates: None present

