



# Micro-Tracers Inc.

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## Rotary Detector Instruction Sheet



### **Function:**

The "Rotary Detector" magnetic separator is designed to separate Microtracers F from formula animal, poultry, and aqua feed, as well as from premixes.

### **Description:**

Micro-Tracers, Inc. fabricates the "Rotary Detector" cabinet and removable weight hopper from stainless steel. The unit is equipped with either a 110 or 220 volt electric motor. It is packed in a plastic carrying cases that can fit under a seat on an airplane.

Each unit includes a lower cabinet in which a magnet is mounted like a potters wheel on the electric motor. One places a filter paper with a center hole punched in it on this magnet. The hole fits over a pin in the center of the magnet thereby locking the paper in place. One then attaches the upper hopper to the lower cabinet.

The "Rotary Detector" can be retrofitted with a rare earth magnetic assembly to increase tracer recoveries, especially of Microtracers RF (colored iron powder). The rare earth magnets do not have a pin at their center but instead have protrusions on the outside of the magnet that hold the filter paper in place.

## **Operation:**

While the magnet is rotating at full speed with the paper affixed, one slowly pours the feed sample to be analyzed through the upper hopper watching the feed exit through the funnel at the bottom of the hopper. If the funnel plugs, one inserts an artist's fan brush and probes the feed until it begins to flow. One may also tap the sides of the upper hopper to encourage the feed to flow.

The funnel of the upper hopper directs the feed over the rotating magnet mounted in the lower cabinet. The Microtracer(s) is attracted by the magnet and lodges in a circular pattern on the filter paper as does most other "tramp" iron. The feed passes over the magnet and is thrown to the side by centrifugal force and falls into the removable plastic bottom bin of the lower cabinet.

More than 98% of Microtracers F will usually be recovered from one pass through the unit.

## **Examination of Retrieved Iron:**

### **a) For Qualitative Testing:**

After one separates the magnetic material (Microtracers F as well as "tramp" iron) from the feed sample, remove the upper hopper from the lower main cabinet. The magnetic material should appear on the filter paper on the magnet as a ring of grey particulates.

Turn the unit on so the magnet rotates at full speed. With an eyedropper, dispense 5 to 10 drops of developer (water or water/alcohol) on the center of the rotating filter paper.

Turn the unit off. When the rotating magnet stops, color will usually be apparent as the dye from the tracer will have dissolved and colored the filter paper. After a few seconds, transfer the paper to a hot plate or oven and dry it. This will "fix" the color from the tracer(s) on the filter paper so that discrete spots may be counted. If the paper is not dried, the color from the tracer(s) may diffuse so much that spots run into each other or the color becomes so light it cannot be discerned with confidence. For certain pelleted feeds with added fat, the color may not dissolve from the tracer particles until the paper is heated at 300 degrees F. This may be necessary to dissolve fat coating the tracer particles. Unless the fat is dissolved, the tracer developer cannot reach the dye of the tracer particle and a "false negative" can result. In some instances, it may be necessary to use DMSO (dimethylsulfoxide) or a solution of 50% DMSO/50% ethanol as a developer to dissolve the fat to obtain a valid tracer result.

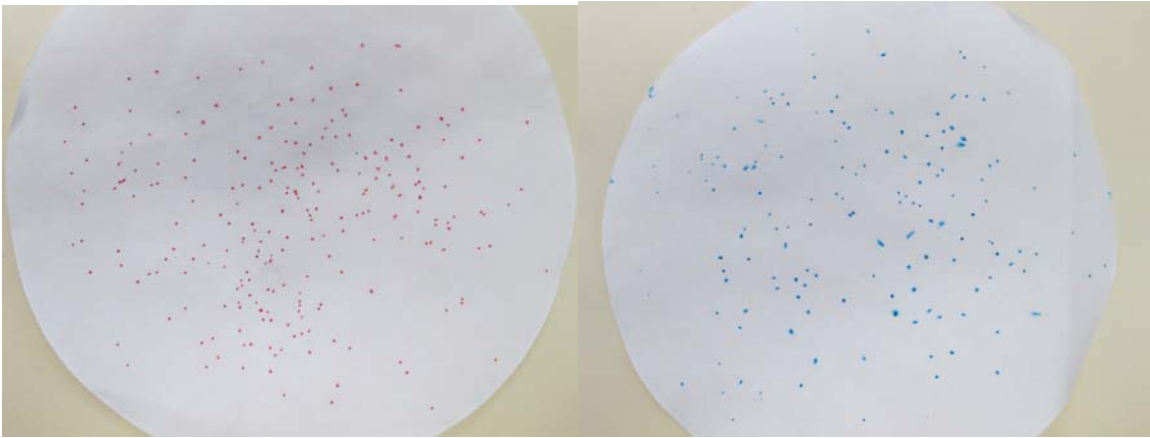
### **b) For Quantitative Testing:**

After the magnetic material (including the Microtracer(s) F is isolated on the filter paper on the rotating magnet, one does not develop the tracer spots on the magnet but rather transfers the magnetic material- to a weigh scoop, One then "demagnetizes" these particles with a bulk tape eraser (provided by Micro-Tracers, Inc.) and then sprinkles the material onto a 15 or 18.5 cm Whatman #1 filter paper wetted with developer (water or water/alcohol). When spots begin to develop, the paper is dried and when dry marked for identification and the spots counted.

Alternately, one can deposit the retrieved tracer on a filter paper, spread the tracer evenly using the provided artist fan brush, then apply the developing solution as a mist to wet the test paper. Either way, one then dries the test paper and counts the colored spots.

For colorimetric measurement of Microtracers RF (colored iron powder), one does not develop the tracer spots on the filter paper on the rotating magnet or a large filter paper, but rather transfers the material to a small test tube. One then adds a given volume of water or water/alcohol developer to the test tube and shakes the tube to dissolve the dye from the tracer. The liquid is then filtered, with the color intensity of the solution determined on a spectrophotometer.

For further information on the quantitative determination of Microtracers F, please refer to literature item "A-3" Quantitative Determination of Microtracers F.



*Examples of Filter Papers Generated for Quantitative Testing*

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