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# **"IGF" STAGE™ SYSTEM**



## The "IGF" STAGE™

The "Induced Gas Flotation" Skim Tank Augmented by Gas Eductor is a revolutionary new system for separating heavy and light particles from a liquid stream. It is created by combining a "Skim Tank" with a "Gas Eductor Flotation Unit" and a "Coalescing Pack" into one API tank. This very high residence time tank allows maximum time for natural gravitational separation, and contacting time for the induced gas. This combination, coupled with a coalescing pack and flocculation chemicals, has created a highly effective bulk separation product.

**The following are the "IGF" STAGE™ System's features and benefits:**

### Simple/Clean Design

- \* Low operating and maintenance cost
- \* Simple conversion of customer's existing tanks to the "IGF" STAGE™ System
- \* Eliminates down time for clean out of solids
- \* Lowers construction and coating cost.

### Circular Flow Path Provides

#### Maximum Residence Time:

- \* Increases oil/water separation
- \* Increases solids/water separation
- \* Decreases tank size requirements
- \* Buffers against oil slugs and other systems upsets
- \* Increase downstream filter efficiency and reduces filter operation cost
- \* Enhances efficiency of chemical treatment programs

### Gas flotation

- \* Increases oil/water separation
- \* Increases light solids/water separation
- \* Enhances chemical mixing and flocculation

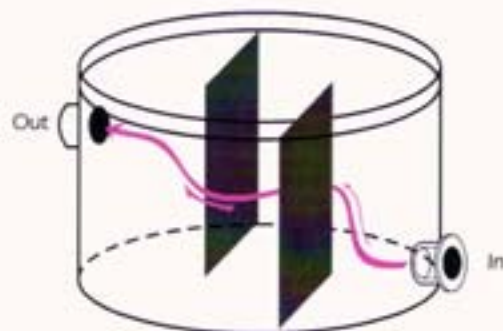
### Coalescing Pack

- \* Removes small free and mechanically emulsified oil droplets
- \* Provides increased surface area for the coalescing of oil droplets.

## Operating Procedures

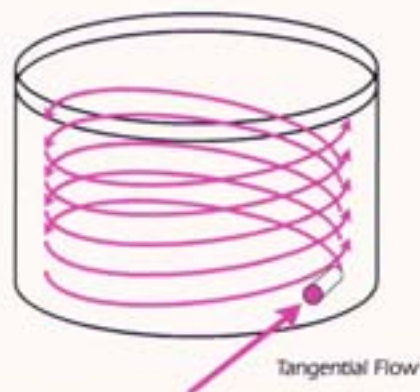
### Residence Time

The "IGF" STAGE™ System design is based on a standard API tank. The liquid enters into the tank tangentially to the outside wall and creates a toroidal flow path. It is the length of this toroidal flow path that produces the long residence time required for gravitational separation to occur. As the toroidal flow continues, the heavy solids will sink to the bottom and move to the vortex in the tank center. The light particles and oil will rise, facilitating their removal by a small weir located near the top of the tank.



Some Channeling of the flow occurs even with baffles.

### Ordinary Tank Channel Flow



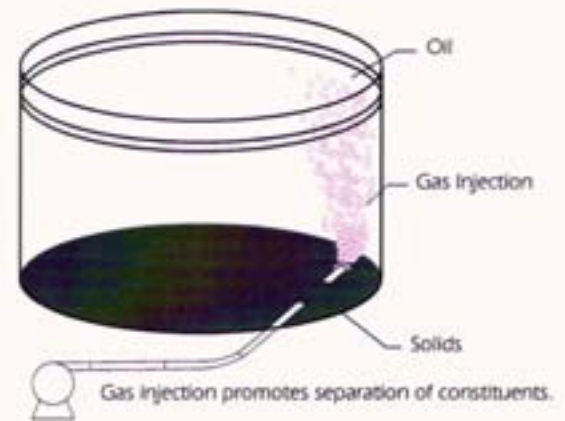
Rotational flow increases residence time

### Skim Tank Rotational Flow

The liquid that has been in the tank the longest (cleanest) will be located in the center of the vortex, where it will enter a coalescing pack in order to remove the remaining free and emulsified oil. The clarified water is then removed by a "Water Leg" synchronized with the oil and light particles removal over the weir.

### Gas Eductor Flotation Unit

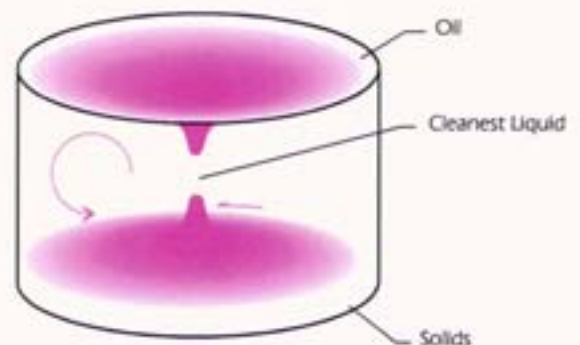
Oil removal by flotation is achieved by adding gas in the form of tiny bubbles to the liquid stream. As the bubbles rise through the liquid they contact and adhere to the small solids particles and oil droplets forming froth. Oil/solids/water separation is enhanced because both the particle size and the density difference have been increased. The net result is a higher velocity rise rate for the froth in accordance with Stokes' Law equation 1. The froth is then allowed to separate from the bulk stream in a quiescent zone by flotation.



**Gas Eductor**

The "IGF" STAGE™ System uses a pump, eductor, static mixer and flow straightener in order to induce the gas into the liquid. The liquid used for ingestion is from the tank or from the inlet line to the tank. The gas comes from the vapor space in the top of the tank and liquid is recycled from the tank to the eductor. This liquid/gas mixture is then fed into the tank where it will be circulated through the liquid in the tank. The gas will rise through the liquid back to the vapor space.

This method of gas flotation produces several positive results. By re-circulation the liquid within the tank, a constant toroidal velocity can be maintained irrespective of the inlet flow rate. This produces a long residence time, and the circular flow path allows the liquid to come in contact with the gas bubbles several times. When compared to other types of dispersed gas flotation equipment, this is an energy efficient method of mixing gas and liquid. In addition, this unit does not create a violent agitation within the tank, which impedes oil/water separation.



The clean liquid is removed by a special "water" leg.

**"IGF" STAGE Tank Separation**

### Coalescing Pack

The coalescing pack provides further oil/water separation. This pack is designed to remove the very small free and mechanically emulsified oil. The pack provides increased surface area for coalescing of the oil droplets. Residual suspended solids are also removed in the pack. The cleanest, longest resident liquid is run through the pack to insure maximum oil/water separation, where it is then removed through a "water leg".

### Chemical Flotation Aids

Surface active chemicals can be used to improve flotation performance and are highly recommended for use in the "IGF" STAGE™ System. By using the eductor as a vehicle to induce these chemicals into the liquid stream, pump cost and maintenance can be reduced.

## Company Profile

Absolute Filtration, Inc was founded in 1989 and after several acquisitions and mergers, evolved into its' present name, Absolute Filtration Industries Corporation. It is incorporated under the laws of the state of Texas and its' corporate offices are located in Odessa, Texas.

AFIC founder, Jerry Hensley, was in the nut shell filter business for several years prior to establishing AFIC and has continued to be a leader in walnut shell filter development since that time. He is the inventor of several walnut shell filter patents and has extensive experience in the manufacturing, service, retro fitting, maintenance and operations of the walnut shell filters sold by AFIC, as well as most of the major competitor's filters.

In addition to the **"IGF" STAGE™ SYSTEM** manufactured by AFIC, we also have several complementary products:

- ❖ **Corrugated Plate Separator**
- ❖ **Induced Gas Flotation Cell**
- ❖ **Walnut Shell Filter**
- ❖ **Automatic Backwashable Cartridge Filters**
- ❖ **Ultra Filtration**
- ❖ **Reverse Osmosis**

See our Full Capabilities Brochure

**Represented By:**



**All of AFIC's products** are constructed under strict control of in house Quality Assurance Programs, designed to exceed all US and international codes, with particular emphasis upon welding quality.



# AFIC

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