



# SANDFLOAT SAF-BP™

## DISSOLVED AIR FLOTATION CLARIFIER / DUAL MEDIA FILTER



The KROFTA™ Sandfloat SAF-BP™ is a patented Dissolved Air Flotation Clarifier and Media Bed Filter that combines flocculation, flotation, and filtration in one piece of equipment. The unit is designed so that individual segments in the filtration process can be backwashed without shutting down the entire unit. There are 19 standard sizes to choose from with capacities ranging from 65 to 16,000 gpm. In addition, the unit can be customized for industrial or municipal applications. Some of the more common applications for the SAF-BP™ include:

- Potable Water Clarification
- Tertiary Clarification & Polishing
- Raw Process Water Clarification
- Reverse Osmosis/Membrane Protection

### SANDFLOAT SAF-BP PROCESS DESCRIPTION

#### FLOCCULATION

Raw water mixed with flocculation and coagulation agents is introduced into the bottom center of the unit in a mixing chamber. Several directional nozzles and baffles within the chamber cause a slow mixing of the raw water and chemicals. The chamber can be designed for extended flocculation times when necessary. As the raw water and flocculated particles rise out of the chamber, they are gently mixed with the aerated water at the surface. Typical retention time within the flocculator is 3-4 minutes.

#### FLOTATION

Aerated water from the ADT mixes with the flocculated raw water and flows under a baffle that slows horizontal velocity into the flotation zone. The flocculated solids attach to the air bubbles that are formed during the aerated water pressure release and are floated to the surface. The clarified water flows onto the media beds below for filtration.

#### FILTRATION

The lower section of the SAF-BP™ is divided into individual filter bed segments or cells. Depending on the application or site specification, each cell is provided with a plate and nozzle base or stainless steel underdrain wedge wire extraction assembly. The clarified water gravity flows through the media beds to the extraction points. Typically there is a minimum of 2 feet of filtration media in each cell. The media may consist of sand and anthracite, sand only, greensand, or some combination of these types of filtering materials; a wide variety of filtering media may be used depending on the application. Clarified/filtered water is collected in a central header attached to each cell segment for discharge.

#### FLOATED SLUDGE REMOVAL

A spiral scoop assembly removes floated sludge from the clarifier. As used in conjunction with the Krofta Automatic Level Control System, the scoop removes only the top layer of the floated materials. This keeps the sludge consistency high, and minimizes sludge volume. Sludge removed from the top of the flotation zone is deposited into the sludge cone located in the center of the unit.



## STANDARD UNITS

SIZE Diameter (ft)	CAPACITY gpm	CAPACITY m <sup>3</sup> /h
5	65	15
8	220	50
10	350	80
12	500	114
15	780	177
18	1130	257
20	1400	318
22	1680	382
24	2000	454
27	2540	577
30	3100	704
33	3800	863
36	4500	1022
40	5500	1249
44	6700	1528
49	8300	1885
55	10500	2385
62	13000	2953
70	16000	3634

### BACKWASHING

Individual segments or cells are continuously isolated for backwashing without stopping the filtration process. Each cell is taken off-line independently of the others. The pipe rings which surround the unit incorporate one effluent valve and one backwash line valve per filter cell. Normal operation has the backwash valves closed and the effluent valves open. When the rotating carriage assembly on the unit increments to an individual cell it activates the backwashing sequence for that cell. The position of the two valves on the backwashing cell are reversed, stopping effluent flow through the media in that cell. An inflatable neoprene seal inflates, isolating the backwashing cell from the rest of the on-line cells. Water is drawn down through the backwash line to approximately four to six inches above the media. Next, an air scour is injected into the cell's media to gently lift the media followed by a partial flow backwash. This is followed by a full flow backwash, followed by a partial flow to allow the media to re-stratify. Backwash water is directed up into a backwash trough and can be either recycled into the flocculator for re-treatment or directed out as waste. The hood seal is then deflated and water is drawn off again through the backwash ring. This continues for a short period until the filtered water returns to the required turbidity specification (NTU). This process may be monitored in each cell with an optional turbidity monitoring system. The valve positions are then reversed and the carriage moves to the next cell repeating the process.

### OPERATIONAL ADVANTAGES

- Viewing windows for flotation and backwash observation
- Compact high through-put design capable of processing up to 5 gpm/sf (12 m<sup>3</sup>/h/m<sup>2</sup>).
- Stainless steel construction – bolt together design
- Dual media filtration
- Flocculation, flotation, and filtration in one piece of equipment
- 1<sup>st</sup> filtrate recycle capability for potable water applications
- Continuous backwash capability
- PLC/DCS/SCADA compatible

### THE AIR DISSOLVING TUBE (ADT)

Common to all Krofta DAF technology, the Krofta™ Air Dissolving Tube (ADT) is in operation in thousands of applications around the world. The ADT eliminates the need for large volumes of air and water used by typical pressure vessels, by using air dispersion technology and centrifugal force in place of sheer volume and gravity. Compressed air is released into the ADT across the surface of an air panel. The panel material and design disperses the air across the entire surface of the panel. This allows for faster dissolution of air into the water and hence a retention time of only eight to twelve seconds. The flow pattern within the ADT is a cyclone or vortex which produces a centrifugal force that eliminates undesirable entrained air. A specially designed inlet nozzle is sized specifically for each application and can be easily changed out if the recycle requirements of future waste streams change significantly. In addition, a proprietary bleed-off outlet also assists in eliminating too much air in the tube itself. This ensures that the tube will never air bind or release undissolved air to the DAF. A sized globe valve is used for pressure release, generating 10-70 micron bubbles well suited for DAF operation.