technical
data sheet

KROFTA®

Bulletin 9001-E

SUPRACELL

(Dissolved air flotation cell)

WASTE WATER FLOTATION CLARIFIER

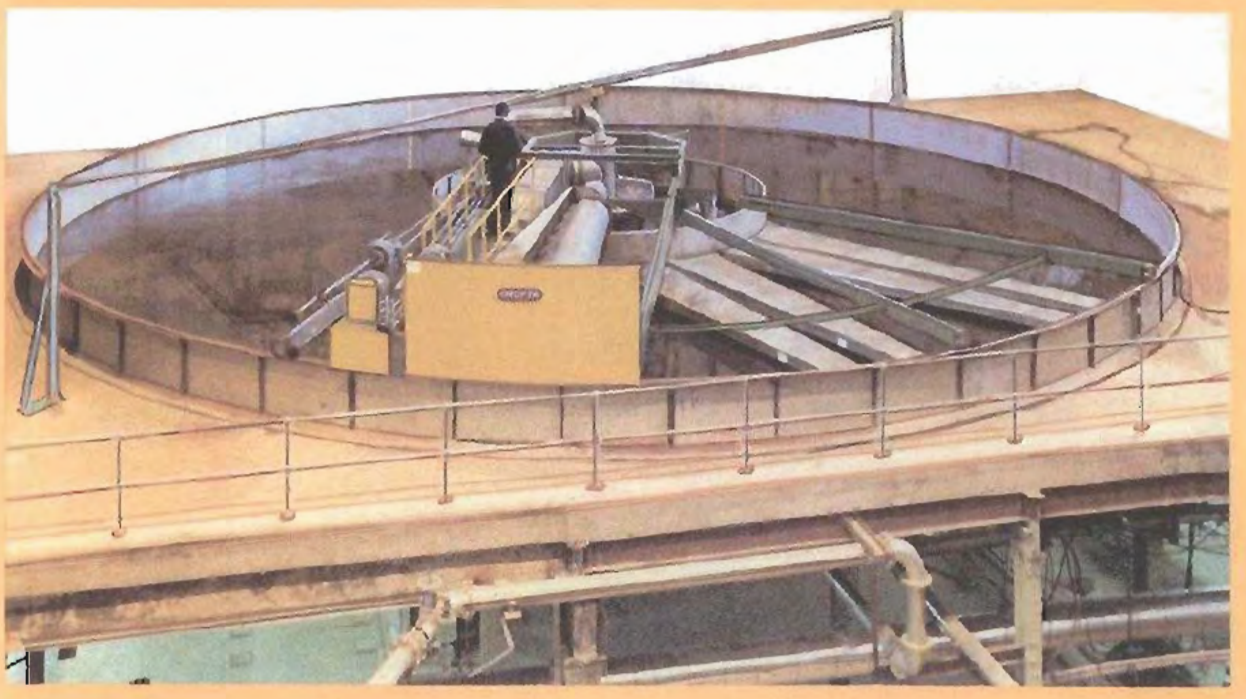


Fig 1 – SUPRACELL SPC 62 *UK*

KROFTA® SUPRACELL and SPIRAL SCOOP

ADVANTAGES

- Very low retention time – 2 minutes 30 seconds.
- High specific clarification capacity (4 · 5 GPM/sqft) means a smaller surface area.
- Purchase cost is lower than any other system of comparable performance.
- Installation cost is low – the unit is delivered fully prefabricated, no heavy supports are needed because of the low weight (150 lbs/sqft).
- The unit maintains value – relocation is easily accomplished.
- Space requirements are minimal – low headroom. Equipment , can be erected above ground level.
- Easy to clean – tank is completely open, bottom is self-cleaning during operation.
- Clarification to below 20 – 30 PPM of filterable solids. Thickened sludge consistency is 2 – 3%.

CONSTRUCTION

The KROFTA SUPRACELL is delivered fully prefabricated. Larger units are delivered in parts which flange together. Construction materials are painted or stainless steel. A tile or concrete tank is optional. No heavy foundation or support structure is needed as the total load factor when filled with water weights less than 150 lbs/sqft.

APPLICATIONS

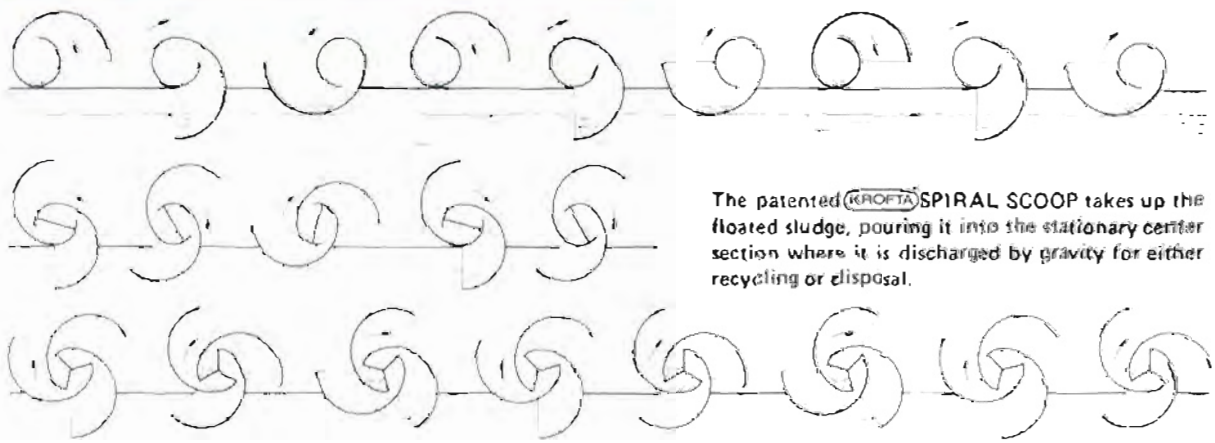
The KROFTA SUPRACELL (US and foreign Patents) is an advanced clarification system, using combined settling and flotation techniques.

The unique compact and efficient design is made possible by use of the principle of "ZERO VELOCITY". The KROFTA SUPRACELL is smaller in surface area for its capacity because a very high specific clarification degree is attained (4 to 5 USGPM/sqft). The water level in the tank is extremely low (16 in). This means reduced size and weight as well as low retention time (2 min. 30 sec.).

The KROFTA SUPRACELL is especially advantageous for situations in which the sludge or water is recycled to the process and where the type of waste water varies. The small volume and short retention times are important for closed system operation. Units are in operation in Pulp and Paper, Deinking, Food Processing, Laundry, Biological Sludge Thickening and Municipal Effluent Clarification. Installation is possible above floor level, over existing chests or machinery, rooftops, or stacked one over another in multiple unit use.

SPIRAL SCOOPS (US and foreign Patents)

Fig 2



The patented KROFTA SPIRAL SCOOP takes up the floated sludge, pouring it into the stationary center section where it is discharged by gravity for either recycling or disposal.

SUPRACELL INSTALLATION

Fig. 3 DESCRIPTION

1 ROTATING CENTER SECTION
2 CLARIFIED WATER OUTLET
3 SETTLED SLUDGE SUMP
4 SETTLED SLUDGE OUTLET
5 (KROFTA) ROTARY CONTACT
6 (KROFTA) SPIRAL SCOOP
7 FLOATED SLUDGE OUTLET
8 UNCLARIFIED WATER INLET
9 CLARIFIED WATER EXTRACTION PIPES
10 GEAR MOTOR
11 DISTRIBUTION DUCT

OPERATIONAL DESCRIPTION

The inlet, outlet and sludge removal mechanisms are contained in the central rotating section. This section and the spiral scoop rotate around the tank at a speed synchronized with the flow.

Unclarified water, first passing through the (KROFTA) AIR DISSOLVING TUBE (see page 6), is released through a rotary joint in the center of the tank. It then passes into the distribution duct that moves forward with the same velocity as the incoming water thus creating "ZERO VELOCITY". The settling and the flotation processes take place in this quiescent state.

The patented (KROFTA) SPIRAL SCOOP takes up the floated sludge, pouring it into the stationary center section where it is discharged by gravity for either recycling or disposal.

Clarified water is removed by extraction pipes which are attached to the moving center section. The clarified water which normally contains less than 30 PPM of suspended solids can be recycled in the process and/or sewered.

Wiper blades attached to the moving distribution duct scrape the bottom and the sides of the tank and discharge settled sludge into the built-in sump, for periodic purging.

The variable speed gear motor drives the rotating elements and scoop. Electrical current for the gear motor feeds from a rotary contact mounted on the central shaft.

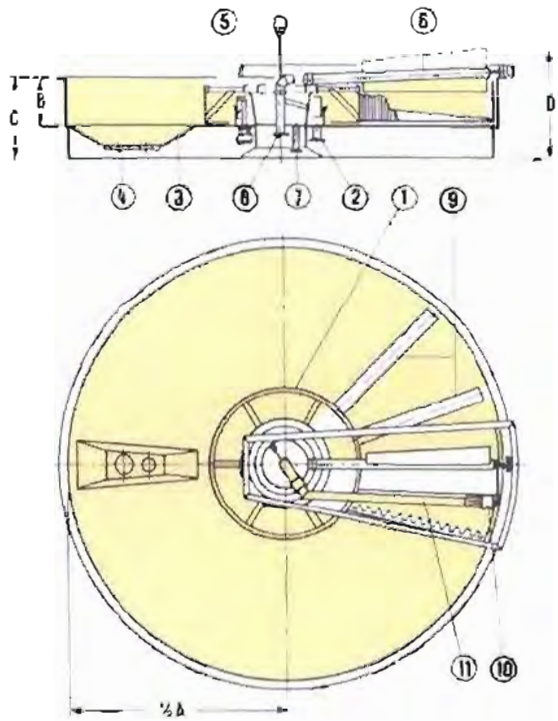


Fig. 3

A DIAMETER of SUPRACELL
B DEPTH of SUPRACELL TANK
C DEPTH of SUPRACELL TANK with BOTTOM SUPPORT
D MINIMUM OVERALL HEIGHT of SUPRACELL

TYPE		DIMENSIONS						FLOW		
A ft	A mm	B in	B mm	C in	C mm	D in	D mm	m^3/min	US GPM	m^3/h
8	2400	23.5	600	33	850	45	1150	0,56	148	34
10	3200	23.5	600	33	850	49	1250	1,00	263	60
12	3900	25.5	650	35	900	51	1300	1,50	394	90
15	4500	25.5	650	37	950	57	1450	2,00	525	120
18	5500	25.5	650	37	960	58	1480	3,00	789	180
20	6100	25.5	650	37	950	61	1560	3,66	961	219
22	6700	25.5	650	37	950	62	1580	4,40	1160	264
24	7200	25.5	650	37	950	63	1600	5,08	1340	305
27	8100	25.5	650	37	950	67	1700	6,44	1695	386
30	9000	25.5	650	37	950	71	1820	7,95	2090	477
33	10000	25.5	650	37	950	72	1840	9,80	2580	588
36	11000	25.5	650	37	950	73	1860	11,87	3125	712
40	12200	26	660	38	960	76	1920	14,60	3840	876
44	13400	27	685	39	985	78	1980	17,60	4630	1056
49	14800	27	685	39	985	82	2070	21,50	5650	1290
55	16800	27	685	39	985	87	2200	27,70	7290	1662
62	18900	29.5	750	41	1050	93	2350	33.30	8800	2000
70	21300	29.5	750	41	1050	93	2350	41.60	11000	2500

SUPRACELL LARGE FLOW INSTALLATIONS KROFTA®

Fig. 4 DESCRIPTION

1 RAW WATER COLLECTION TANK
2 SUPRACELL FEED PUMP
3 SUPRACELL INLET PIPE (inbedded in ground)
4 INLET COMPARTMENT
5 SETTLED SLUDGE SUMP
6 SETTLED SLUDGE DISCHARGE
7 CLARIFIED WATER OUTLET
8 CLARIFIED WATER RETURN for LEVEL CONTROL (1)
9 LEVEL CONTROL in SUPRACELL with PNEUMATIC SENSOR and CLARIFIED WATER DISCHARGE REGULATING VALVE
10 PRESSURE PUMP for RECYCLING of CLARIFIED WATER to the AIR DISSOLVING TUBES
11 AIR DISSOLVING TUBES
12 SUPRACELL MAIN TANK
13 SPIRAL SCOOP for COLLECTION of the FLOATED SLUDGE
14 FLOATED SLUDGE
15 STEEL LEGS
16 SECOND ELEVATED SUPRACELL in STEEL CONSTRUCTION

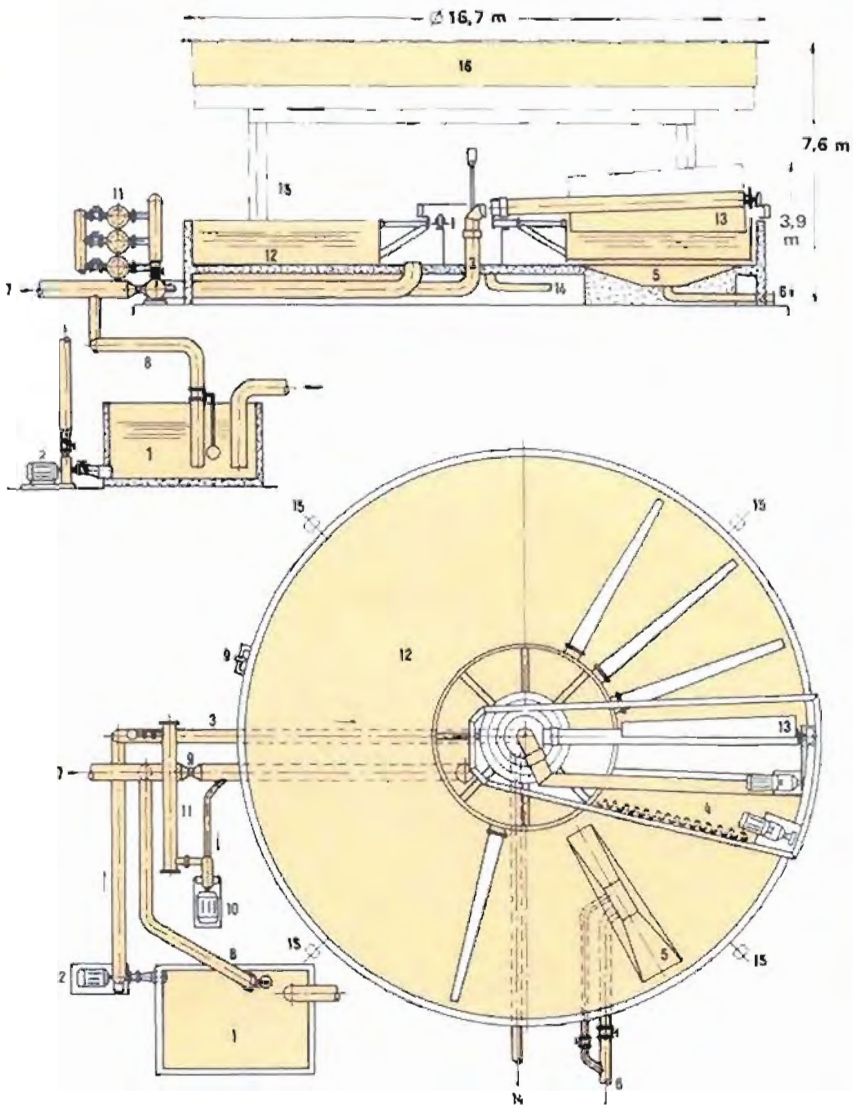


Fig. 4

Two SUPRACELLS 55 ft diameter
Flow 10.5 US MGD each. Total flow 21.0 US MGD

DESCRIPTION

For large flow (5 – 21 US MGD) KROFTA SUPRACELL Installation the total cost can be kept low by installing the SUPRACELL on a flat concrete ground pad. Because of the low water level in the tank (normal height - 16" emergency overflow - 24") the maximum load on the concrete pad is 140 lbs/sqft. (Less than for a parking lot.)

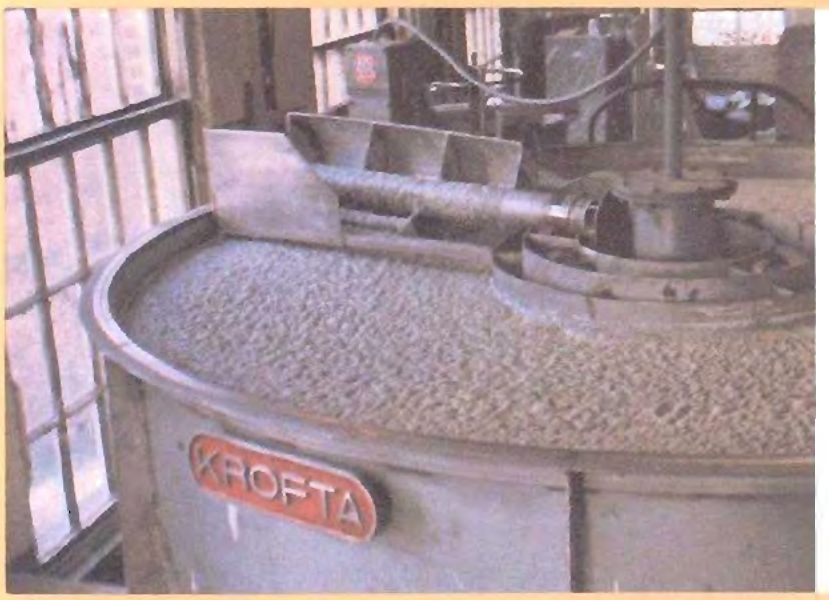
The raw water inlet, clarified water outlet and sludge discharge pipes are inbedded in the ground under the concrete pad. The water level in the SUPRACELL is controlled by a pneumatic sensor, which regulates the clarified water discharge valve. Alternately an inbuilt central clarified water overflow is regulated from the rotating carriage by manual or remote control.

For doubling the capacity a second SUPRACELL can be installed on 4 legs over the bottom one (see Fig. 4). This second SUPRACELL is built in steel with steel supports. Because of the low load when filled, such construction is recommended where space is at premium.

Installations of 3 SUPRACELLS installed one over the other have been built, all incorporated in light-weight housing.

SUPRACELL
Type SPC 30
Outdoor installation
Deinking effluent clarification
England

Fig. 5



SUPRACELL
Type SPC 10
Inside installation
Tissue production
Totally closed water system
U.S.A.

Fig. 6

SUPRACELL
Type SPC 27
Spiral Scoop
Italy

Fig. 7

KROFTA

AIR DISSOLVING TUBE

DESCRIPTION

Raw or recycled water, pressurized to 55 - 85 PSI (4 - 6 bar) enters the AIR DISSOLVING TUBE tangentially at one end and is discharged at the opposite end. During the short passage the water cycles inside the tube and passes repeatedly by an insert, fed by compressed air. Very thorough mixing under pressure dissolves the air in the water.

Because of the small diameter the AIR DISSOLVING TUBE does not require official testing and coding. The small dimensions allow an economical construction in stainless steel.

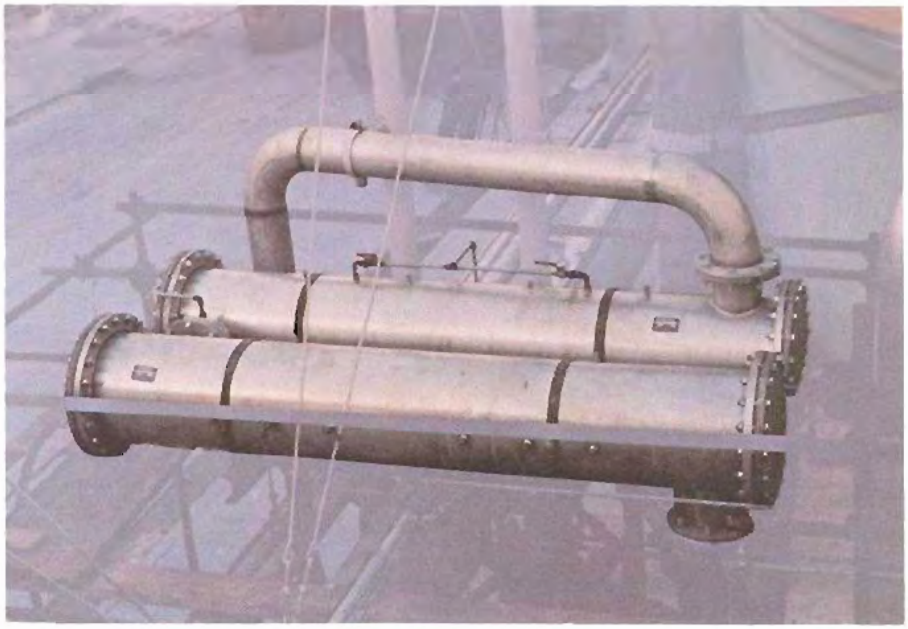


Fig. 9 2 AIR DISSOLVING TUBES Type 2500 for 1315 GPM total Flow *Italy*

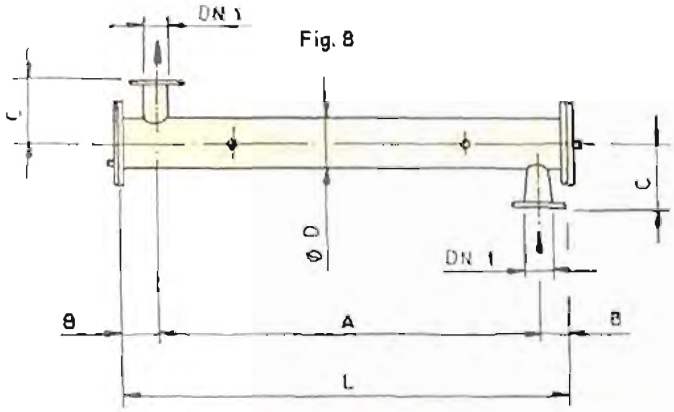


Fig. 8

DIMENSIONS of AIR DISSOLVING TUBES (Fig.8)

SIZE	CAPACITY	DIMENSIONS			
Unit Type	Max.GPM	B	A	C	D
60	15	6"	24"	1½"	18½"
150	40	6"	48"	1½"	41"
300	80	10"	39½"	2½"	31½"
500	130	12"	46"	2 ½"	34"
1000	260	12"	92"	4"	82"
1500	400	14"	98½"	4"	88"
2000	530	16"	121"	6"	105"
2500	660	18"	106"	6"	90½"
3000	800	18"	121"	6"	105"

FRICTION VALVE

Available in sizes :
4" and 6" diam.

Fig. 10

DESCRIPTION

The pressurized water is decompressed in a KROFTA FRICTION VALVE, where the liquid is forced through a narrow slot in a coil spring. High shear is produced and dissolved air is forced out of the solution into microscopically small bubbles, required for good flotation of suspended solids.

KROFTA ENGINEERING CORPORATION
101 Yokun Avenue, P.O.Box 972 LENOX, MA 01240 U.S.A.
TEL. (413) 637 0740-Telex 92 6443-FAX (413) 637 0768