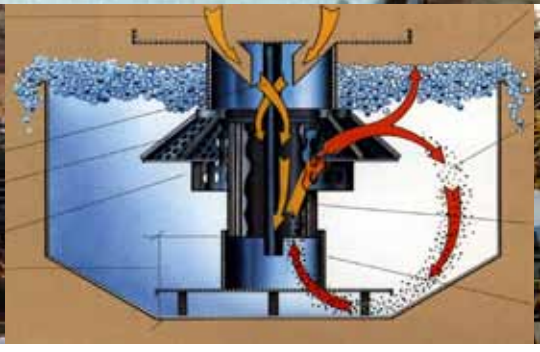
One Source

WEMCO 1+1 Flotation Machines

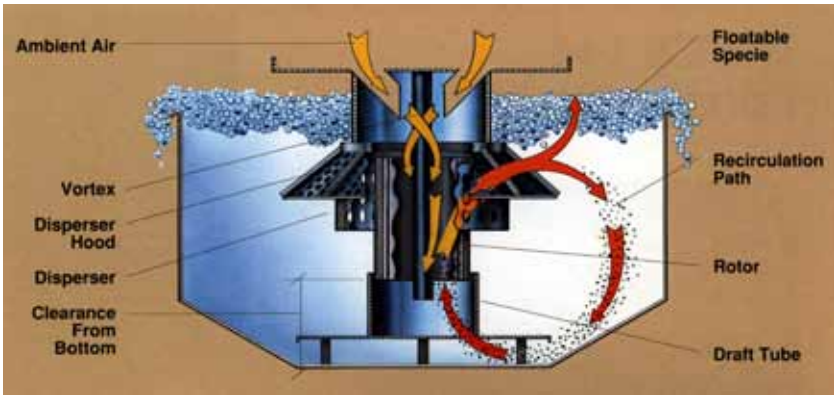


FLSmidth

Flotation cells designed for more profitable minerals concentration

Choose WEMCO for Productivity

- **Superior air dispersion and high slurry re-circulation ensure adequate residence time for optimum recovery and concentrate grade.**
- **Choose WEMCO for Economy Simple, induces aeration reduces both capital and operating costs.**
- **Efficient air dispersion reduces frother consumption·Reduced mechanism erosion slashes maintenance costs**



Exclusive Design, Proven Superiority

WEMCO® 1+1® Flotation Machines feature a unique design that is demonstrably superior to other mechanical flotation systems. In direct comparisons by major mining companies, WEMCO 1+1 cells have repeatedly delivered higher recovery and grade with easier start-up, simpler operation, lower reagent consumption, longer mechanism life and less required maintenance. WEMCO is a world leader in large cell technology with the greatest installed capacity of any flotation manufacturer.

Unique Flotation Mechanism

At the heart of each 1+1 cell is a patented rotor-disperser that delivers intense mixing and aeration. Ambient air is drawn into the cell uniformly distributed throughout the pulp, providing optimum air/particle contact. In larger cells a false bottom and draft tube channel slurry flow, ensuring high re-circulation and eliminating sanding. This combination of efficient aeration and optimum solids suspension gives WEMCO 1+1 cells the highest specie recovery and concentrate grade performance available, and reduces reagent consumption.

Self-Induced Aeration

Airflow into the pulp is induced by the turning rotor. No forced air supply system is required, eliminating the capital and operating costs of blowers and distribution piping. Airflow compensation for varying feed densities is automatic, minimizing the operator attention required. An additional benefit is that one mechanism can be removed for service without interrupting production, unlike forced-air systems which require shut down of an entire cell bank for service access to a single mechanism.

WEMCO 1+1 flotation cells

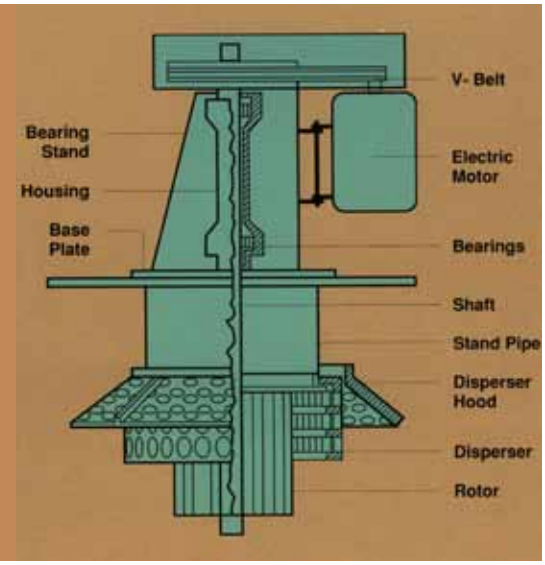
Elevated Rotor Position

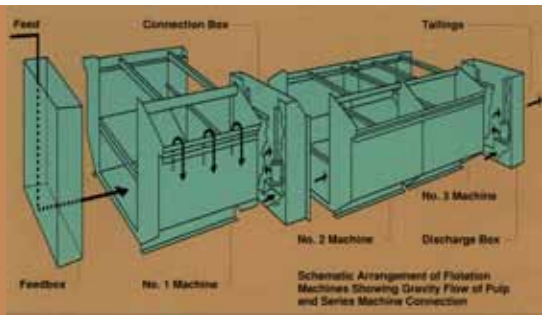
To reduce wear on rotor and disperser surfaces, WEMCO designers have positioned the 1+1 aeration mechanism well above the tank bottom, eliminating contact with abrasive, oversized tramp material. After shutdown, the elevated rotor allows 1+1 cells to be restarted instantly, unlike conventional designs with rotor and floor-mounted stator located in the zone of heaviest solids accumulation.

Large Design Clearances

Aerator mechanism erosion is further reduced by large design clearances between rotor and disperser. Normal wear life of a Wemco 1+1 mechanism is 2 - 4 times that of closely spaced conventional rotor/stator designs. Because WEMCO mechanisms stay within design tolerances longer, peak metallurgical performance is maintained over a longer period, further enhancing profitability.

Simple design, rugged construction, flexible operation





13 Cell Sizes

A wide range of cell sizes from 1 to 3,000 cubic feet offers field proven machines for virtually any application.

Reliable, Automatic Level Control

A unique electronic/pneumatic level control system uses dual bubble tubes or ultra-sonic devices to accurately measure and precisely control pulp level regardless of fluctuations in density. Convenient panel displays provide continuous, easy-to-read access to operating information. This PLC unit integrates easily with mill DCS systems for complete remote operation from the control room, including set point and process variable readout.

Durable Rotor-Disperser Materials

The rotor blade and stator are molded from thick abrasion-resistant rubber. The elasticity and toughness of this material provides maximum protection against attrition, even in applications where the pulp contains excessive coarse or abrasive material.

Rugged Mechanism Assembly

Simplicity and rugged construction make the WEMCO 1+1 Flotation mechanism extremely reliable and keeps maintenance to a minimum. A heavy-duty bearing stand supports the motor driven V-belt and shaft assembly. Twin oversized antifriction bearings mounted in coast iron housing maintain accurate shaft alignment, ensuring smooth, trouble-free rotor operation. The stand pipe, disperser, and hood are suspended beneath the base plate.

Reversible Operation

Complete sectional symmetry allows the 1+1 rotor to be operated either clockwise or counter-clockwise and rotated end-for end, permitting transposition of worn and unworn surfaces and further extending mechanism life.

Many Particle Sizes Treated Efficiency

WEMCO 1+1 Flotation cells are commonly used in coarse float applications such as phosphate and potash with feeds of up to 85% plus 65 mesh an maximum particle sizes as large as 10 - 12 mesh.

Flexible, Modular Tank and Box Design

The basic module of the WEMCO 1+1 Flotation system is a cell consisting of a single tank and mechanism. Several cells are bolted together to form a flotation machine with feed, connection and discharge boxes as required. Pulp level in the tanks is controlled by automatically operated dart valves in the connection and discharge boxes. All boxes are elastomer lined for maximum abrasion resistance.

Hydrodynamic performance

The table on the left lists key design parameters which govern geometric and hydrodynamic scaleup procedures for WEMCO 1+1 machines, assuring comparable metallurgical performance in all cell sizes.

Air Escape Velocity recognizes air flooding limits where excess air flow produces large bubbles, pulp surface geysering and froth disruption.

Specific Circulation Intensity relates pulp turnover frequency to cell size.

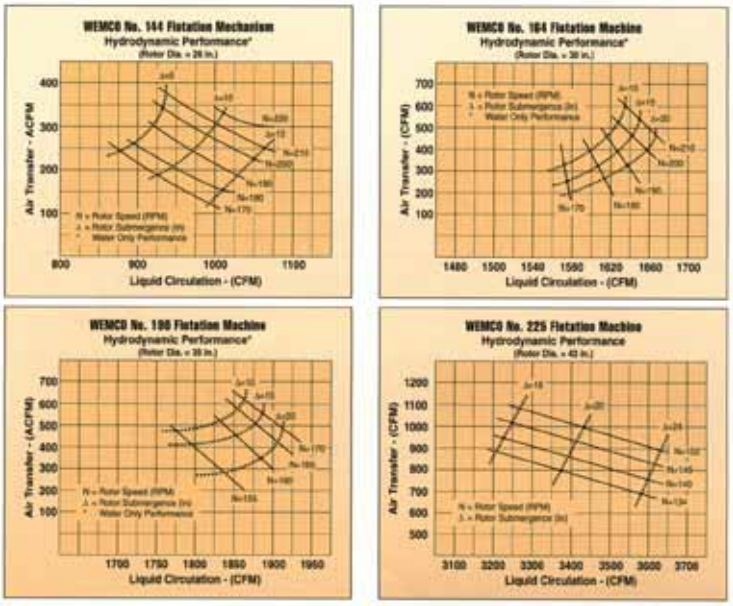
Air/Pulp Mixing Residence Time and Mechanism Power represents mixing conditions in the rotor-disperser region where air-particle contact is established.

Pulp Circulation Velocity is determines by the solids suspension requirements of the feed. This number increases for larger cells because solids must be suspended over a larger span.

Froude Number also indicates the solids suspension capability of the mechanism.

Air Capacity Number is recognized metallurgical performance optimization parameter.

These figures show the hydrodynamic (air transferpulp circulation) characteristics* of 4 large WEMCO Flotation machines, and typify all WEMCO machine sizes for 3000 to 1cu. ft. in volume. For any given machine size or rotor diameter, the air transfer pulp circulation relationship can be operationally varied by changing rotor speed and/or rotor submergence in the pulp. Increasing rotor speed at fixed submergence produces higher air transfer and pulp circulation rates, while increasing rotor submergence at fixed speed increases pulp circulation and reduces air transfer. This provides machine flexibility for the achievement of optimum metallurgical performance for fine, coarse, and mid-range particle size applications.



WEMCO Flotation Machine "Design Scale-Up"

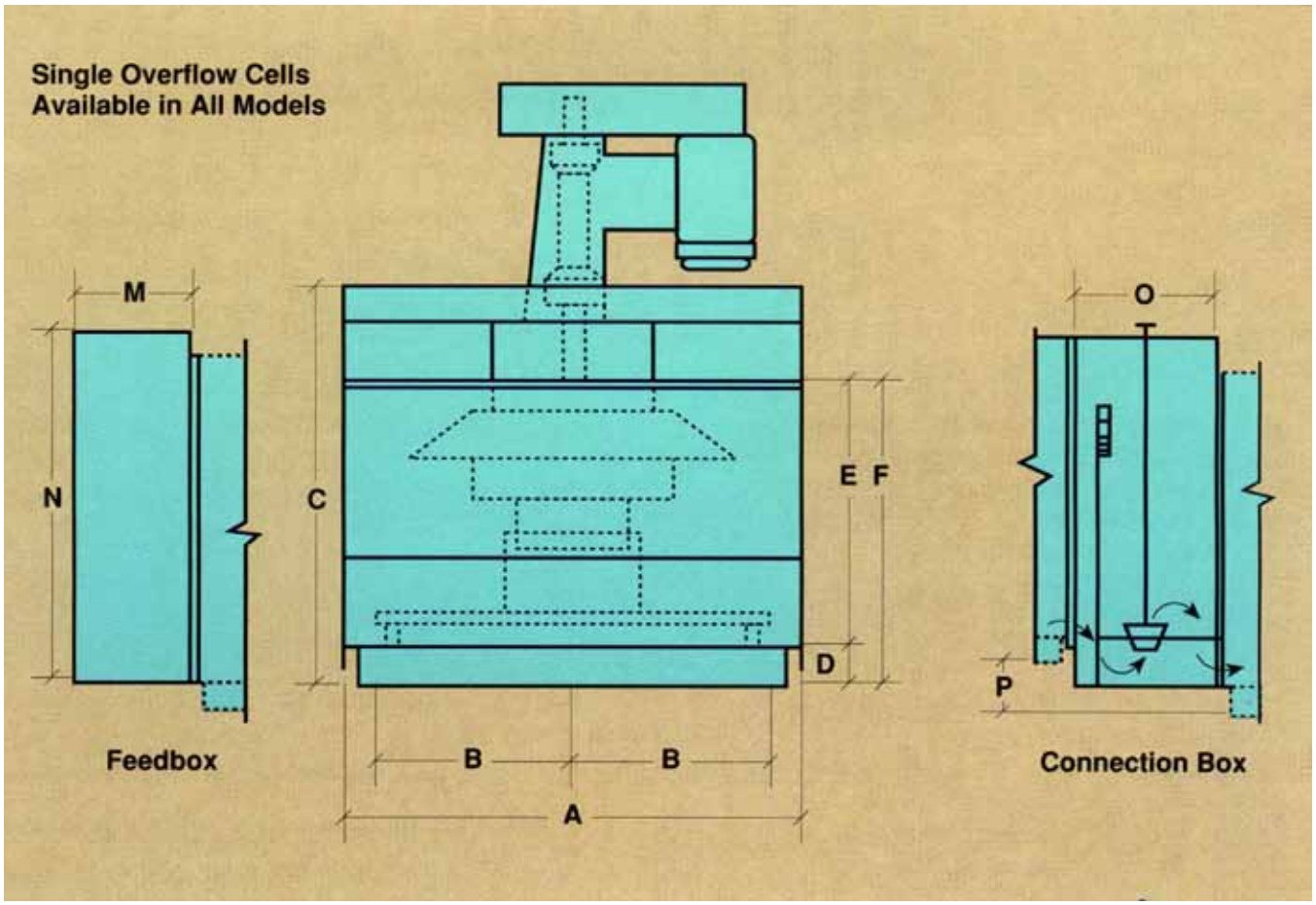
Design Parameters	Cell Size Designation			
	#144	#164	#190	#225
Cell Volume (cu. ft.)	500	1000	1500	3000
Froth Area (sq. ft.)	99	122	168	224
Air/Pump Mixing Volume (cu. ft.)	15	31	51	105
Impeller Speed (RPM)	192	185	164	140
Air Transfer* (ACFM)	240	370	560	870
Liquid Circulation* (CFM)	970	1620	1870	3370
Mechanism Power* (HP)	26.7	48.3	82.7	160
Air Escape Velocity (Ft/min)	2.42	3.03	3.33	3.88
Specific Circulation Intensity (1/min.)	1.94	1.62	1.25	1.12
Air/Pulp Mixing Residence Time (Sec.)	0.72	0.92	1.26	1.49
Mechanism Power Number (P/pn^3D^5)	0.019	0.019	0.022	0.024
Pulp Circulation Velocity (Ft/min)	263	330	280	334
Air Capacity Number (Qa/ND^3)	0.123	0.128	0.138	0.135
Froude Number (N^2D/g)	27.2	29.1	26.7	23.9

**Water only tests*

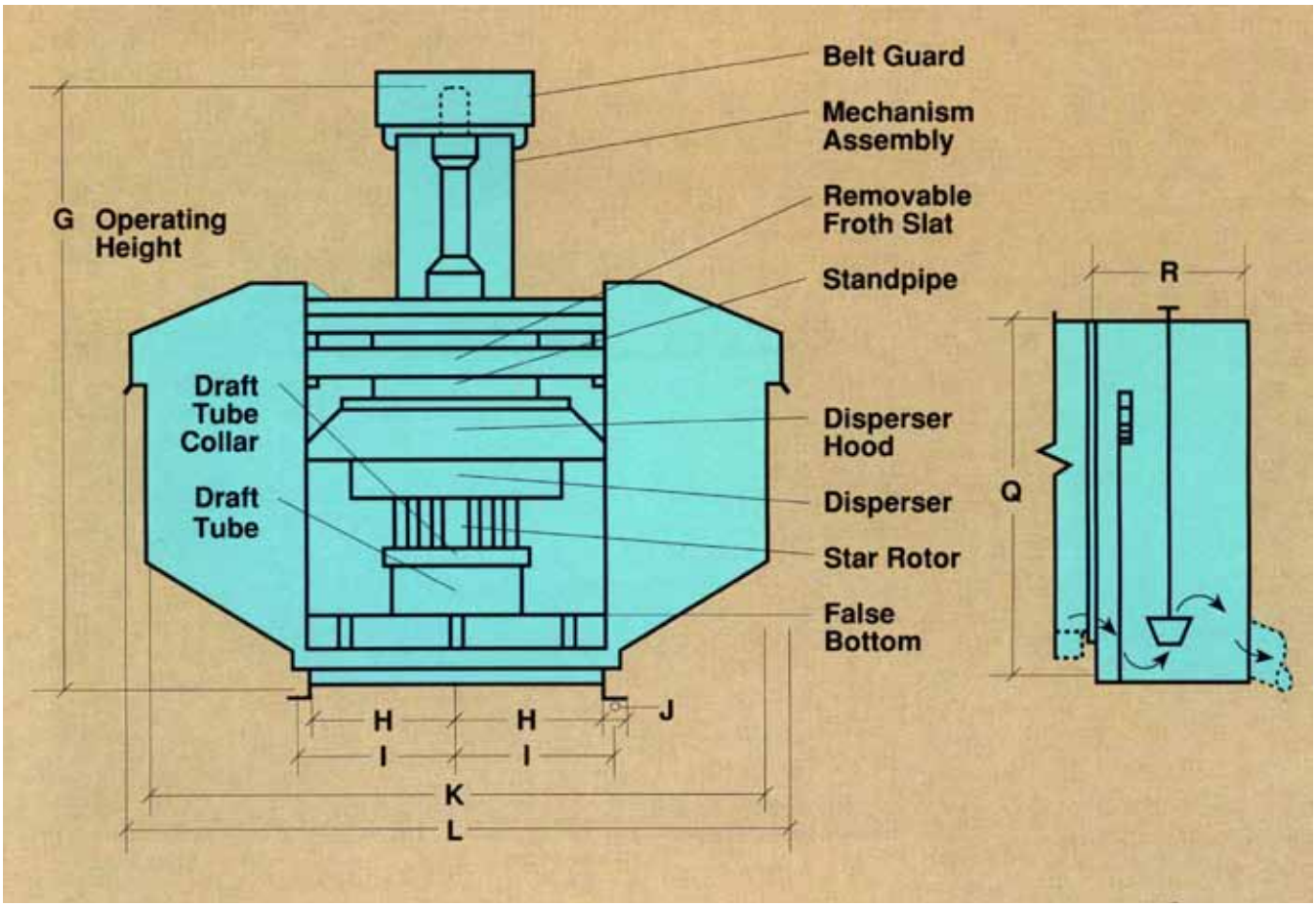
P = Power
N = Speed
D = Diameter
p = Density (Lb./cu.Ft.)
g = Acceleration due to gravity (Ft/sec2)
Qa = Air Transfer (ACFM)

Dimensions & engineering data

Model	Cell Volume (Cu. Ft.)	Length A	B	C	D	Depth E	F	Opt. Height G	H	I	J
18	1	12.375"	4.875"	1'-6.625"	3.1875"	10"	13.1875"	2'- 8.3125"	4"	4.875"	1.375"
28	3	18.375"	9.5"	2'-0.6875"	3.1875"	12"	15.1875"	3'- 3.5"	5.75"	6.625"	1.375"
36	11	3'- 0.375"	2'-3.875"	2'-7.8125 "	4.1875"	16"	20.1875"	4'-10"	8.5"	9.5"	1.5625"
44	21	3'-8.375"	2'-11.875"	3'-3.0625"	6.1875"	20"	2'-2.1875"	5'-4.5"	11.125"	12.25"	2"
56	40	4'-8.5"	4'-0"	3'-8.25"	6.25"	2'-0"	2'-6.25"	6'-1"	13.25"	14.375"	2"
66	61	5'-6.5"	4'-10"	3'-10.75"	6.25"	2'-3"	2'-9.25"	6'-4.625"	1'-2.625"	1'-3.75"	2"
66D	100	5'-0.5"	4'-4"	5'-6.75"	6.25"	3'-11"	4'-5.25"	7'-9"	1'-2.625"	1'-3.75"	2"
84	150	5'-3.625"	2@2'-3.5"	6'-6.25"	8.25"	4'-5"	5'-1.25"	8'-3"	1'-7.75"	1'-10"	3.6875"
120	300	7'-6.75"	2@3'-5"	6'-9.125"	8.375"	4'-5"	5'-1.375"	10'-1.375"	2'-4.625"	2'-6.875"	3.5"
144	500	9'-0.75"	2@3'-7"	7'-11"	12"	5'-3"	6'-3"	11'-2.875"	2'-11"	3'-2.5"	5"
164	1000	9'-11.875"	3@ 3'-0"	10'-1"	6.375"	7'-8.625"	8'-3"	14'-10.25"	3'-4.5625"	3'-7.0625"	4"
190	1500	11'-9"	3@3'-6"	11'-3.25"	6.375"	8'-8.625"	9' -3"	16'-4.25"	3'-11"	4'-1.5"	4"
225	3000	13'-8.75"	3@50.25"	15'-9"	8.5"	12'-6"	13'-2.5"	21'-11"	4'-6.875"	4'-9.375"	4"



Width Inside K	L	M	N	O	P	Q	R	Cell		Mechanism		
								Mechanism Plus Tank Wgt. (Lbs.)	Cell Floor Space (Sq. Ft.)	Rotor Diameter and Height (in inches)	Installed Power (HP/Cell)	Weight (Lbs.)
18"	2'-3.5"	10"	21.1875"	10"	3"	21.1875"	10"	320	1.5	3.5 x 4	0.5	200
2'-4"	2'-9.625"	10"	20.8125"	10"	3"	2'-0.6875"	10.875"	520	3.5	5.5 x 6.25	1 - 1.5	320
3'-0"	3'-5.625"	10.6875"	2'-3.8125"	10.6875"	6"	2'-7.8125"	10.6875"	840	9	7 x 8.5	3	560
3'-8"	4'-1.625"	15.6875"	3'-1.0625"	14.6875"	6"	3'-3.0625"	15.6875"	1100	13.4	8.5 x 10.125	5	620
4'-8"	5'-2"	18.25"	3'-8.25"	17.875"	8"	3'-8.25"	18.25"	1770	21.75	11 x 13	7.5	850
5'-6"	5'-11.75"	12"	3'-10.75"	10"	8"	3'-10.75"	24.25"	2080	30	12.75 x 13	10	900
5'-6"	6'-0.25"	17.875"	5'-6.75"	17.875"	8"	5'-8.75"	17.875"	2600	27.5	16 x 16	15	1100
7'-0"	7'-6"	2'-0"	6'-4.3125"	2'-0"	12"	6'-6"	2'-0"	5200	36.75	16 x 16	15 - 20	1500
10'-0"	10'-6"	3'-1"	6'-6.125"	3'-0.5"	12"	6'-8.125"	3'-1"	6900	75	22 x 23	25 - 30	2300
12'-0"	12'-6.25"	3'-0.75"	7'-10.75"	3'-0.75"	12"	7'-9.625"	3'-0.75"	9650	108	26 x 26	30 - 40	2900
13'-8"	14'-8.5"	4'-0.75"	9'-9"	2'-6"	24"	10'-3.5"	3'-0.75"	15,500	140	30 x 30	60 - 75	5300
15'-10"	16'-10.5"	4'-0.75"	11'-3"	2'-6"	24"	11'-4"	4'-0.75"	21,300	185	35 x 38	100	7900
18'-9"	20'-4"	48.75"	15'-9"	3'-0.75"	36"	15'-3"	4'-0.75"	51,800	256	43 x 45.25	200	20,500



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