TUNAIR SHAKE FLASKS

The **TUNAIR™ Shake Flask Systems** are a unique and patented flask and closure system, designed for microbiology and biotechnology applications. This system provides optimum growth conditions for aerobic microorganisms, mammalian cells, and plant cells. They also provide better culture growth and productivity than standard Erlenmeyer flasks. The TUNAIR™'s high oxygen absorption rate is due to the unique baffling and turbo-vane closure design. The TUNAIR™ systems are designed to increase the availability of dissolved oxygen as well as improve cell yields. There are three (3) flask designs available depending on your application; the No-Baffle (normal throw), the Half-Baffle (vortex motion), and Full-Baffle (propeller motion). The slip on cap and filter linings protect the flask neck from airborne particles and eliminates the need for flaming. All TUNAIR™ flasks, caps, and linings can be sterilized by autoclaving.

Ordering Information

Catalog#	Description
SS-7001	TUNAIR™ Sample Kit-1 Kit

SS-7001 sample kit comes complete with one (1) polypropylene 300ml no-baffle flask, one (1) polypropylene 300ml Half-Baffle flask, one (1) polypropylene 300ml full-baffle flask, three (3) 300ml two piece caps, one (1) 300ml silicone cap lining, two (2) 300ml Dri-Gauze cap lining, one (1) polypropylene 2.5L full-baffle flask, one (1) 2.5L two piece cap, one (1) 2.5L silicone cap lining.

Ordering Information

Catalog#	Description
SS-3014	Cap, two piece (300ml Flask)-1Ea.
SS-3015	Cap, two piece (2.5L Flask)-1Ea.

TUNAIR™ caps are available in four convenient colors; red, blue, green, and yellow!

The two piece cap assemblies are constructed of polypropylene, and are resistant to most solvents. All caps and flasks are fully autoclavable prior to reuse, and filter linings can also be autoclaved or simply replaced. To replace the filter lining in the cap assembly simply pinch the flanges of the inner-closure shell until they snap loose, then pull apart and remove used lining. Replace the lining by sandwiching it between the two parts of the cap and snap the cap back together. When reassembling the cap, ensure the flanges from the inner piece snap into the mated grooves in the outer piece. This will ensure the cap assembly stays together during use.

Ordering Information

Catalog#	Description
SS-3016	Silicone Membrane Cap Linings (300ml Flask)-5 Pack
SS-3017	Silicone Membrane Cap Linings (2.5L Flask)-5 Pack
SS-3018	Dri-Gauze Cap Linings (300ml Flask)-5 Pack
SS-3019	Dri-Gauze Cap Linings (2.5L Flask)-5 Pack

All IBI TUNAIR™ filter linings are 0.22 micron, and are available in silicone or nitrocellulose membranes.

TUNAIR™ flasks were compared to conventional flasks using four different types of microorganisms; *Escherichia coli*, *Saccharomyces cerevisiae*, *Penicillium avellaneum*, and *Streptomyces chartreusis*. The aeration capacities of the shake flasks were determined by the sulfate oxidation method, and the values shown below are presented as oxygen absorption rate (OAR) in mM oxygen/L/Min. The growth rates of *E.coli* and *S.cerevisiae* were expressed as optical densities (OD) at 555mM. For *S.chartreusis* and *P.avellaneum* growth rates were evaluated by percent sedimentation. For *E.coli* and *S.cerevisiae*, the growth rates were determined after an 18 hour incubation period; for *S.charteusis*, aa 24 hour incubation period; and for *P.avellaneum*, a 72 hour incubation period. Growth and OAR evaluations were carried out with 3-9 replicates and statistically analyzed using Turkey's w-procedure. See results below. . .

Growth Evaluation of four (4) microbial types in TUNAIR™ flasks vs. other currently used shake flasks

	OAR Value mM O_2/L/Min	OD @ 555mM E.coli	OD @ 555mM S.cerevislae	% Sedimentation S.chartreusis	% Sedimentation P.aveilaneum
TUNAIR™ Full-Baffle	4.25	7.09	5.63	19.70	3.3M
TUNAIR™ Half-Baffle	1.22	5.36	5.57	27.73	30.50P
Triple Indented Flasks	2.47	5.97	5.31	19.20	9.50MP
Unbaffled Erlenmeyer	0.52	5.97	5.19	17.37	25.10P

*Growth morphology: M, mycelial; P, pellet; MP, mixed mycelial. The mycelial growths mostly adhered to the walls of flask, which accounted for the low overall sedimentation value.