Autoclavable Bioreactors: Mixing Times									
Reactor Configuration				Mammalian Cell Culture N=100rpm, Marine Imp.			Bacterial Culture N=1000rpm, Rushton Imp.		
Reactor Volume V (1)	Impeller Diameter D (mm)	Reactor Diameter D (mm)	Liquid Height H (mm)	Impeller Power no N	Impeller Height H (mm)	Mixing Time t (sec)	Impeller Power no N	Impeller Height H (mm)	Mixing Time t (sec)
1	45	96	150	3	28	1.3	6	11	0.2
2	45	115	125	3	28	1.6	---	---	---
2	45	105	175	---	---	---	12	11	0.2
3	45	130	200	3	28	3.2	12	11	0.4
5	60	170	200	3	37	2.8	12	15	0.3
7	60	170	300	6	37	3.4	18	15	0.4
15	74	222	365	6	45	4.3	18	15	0.5
20	74	222	550	9	45	5.7	18	19	0.8

Measurements of the mixing time in a two and three liter reactor have shown to comply well with these correlations (Kakes and Oosterhuis, 1990). It is obvious from this table that the mixing times are very small in relation to the characteristic times that are to be expected for the metabolism (e.g. oxygen uptake rate, substrate consumption rate) of the micro-organisms. Therefore the medium can be looked upon as being ideally mixed at all times during fermentation.

Chemglass Life Sciences
3800 N. Mill Rd, Vineland, NJ 08360
p (800) 843-1794 • f (800) 922-4361
www.cglifesciences.com