SERFILCO®

MIXER SELECTION GUIDELINES

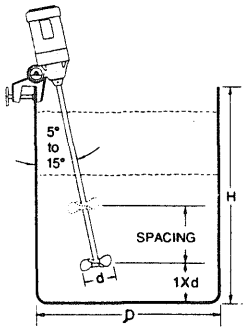
TECHNICAL BULLETIN TA-105

SELECTION GUIDELINES

The following guidelines and selection tables are based on mixing in vertical cylindrical tanks with flat, dished or shallow cone bottoms. Mixer selections may vary with tank shape, retention times, starting conditions, etc.

For liquid levels .5 to 1.1 times the tank diameter, a single propeller is suitable.

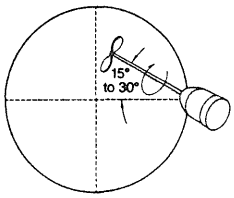
A single propeller may be located from .5 to 2.0 propeller diameters off the tank bottom. The optimum distance is one(1) diameter off the bottom. (Example: 10" diameter prop, should be approximately 10" off the tank bottom)



For liquid levels 1.1 to 1.6 times the tank diameter, dual propellers are recommended.

When dual propellers are required, spacing between gear-driven mixer propellers should be approximately two(2) propeller diameters: propeller spacing for direct-drive mixers should be 4 to 5 propeller diameters.

Mixer position in unbaffled tank should be as shown for maximum turnover of liquid and optimum mixing. Positioning the propeller "on center" will produce a vortex which may help in wetting and dispersing light solids.
Mixer position in square and rectangular tanks is similar to cylindrical tanks. When L is more than 2 x W consult your SERFILCO representative.



Proper matching of propeller and motor is usually based on the turnover, or pumping rate, for the application (Polymer mixing is an exception).

Pumping rate is arrived at by the following:

$$\frac{Q=N_Q N d^3}{231}$$

WHERE:

Q = pumping rate in gallons per minute

N = mixer speed in RPM

d = propeller diameter in inches

N_Q = pumping coefficient for propeller type (1.0 or "square" pitch marine propeller, N_Q =.5) standard (1.5 "steep" pitch marine propeller, N_Q =.77) optional

Propeller horsepower requirements can be calculated from:

$$\frac{HP=Np\,P\,N^3 d^5}{1.53 \times 10^{13}}$$

WHERE:

HP = horsepower required

N = mixer speed in RPM

d = propeller diameter in inches

P = specific gravity of mixture

N_p = power coefficient for a class of propellers (1.0 or "square" pitch marine propellers, N_p =0.35) standard (1.5 "steep" pitch marine propellers, N_p = 0.85) optional

SELECTION TABLES

Two or More Liquids (Blending)

PRODUCT VICOSITY	VOLUME GALLONS					
	30-50	75-100	200-400	500-750	1000-1500	2000-3000
Up to 100 cps	SMD25	SMD25	SMD33	SMD75	SMG33	SMG75
250-750 cps	SMD33	SMD50	SMD75	SMG33	SMG75	SMG150
1000-2500 cps	SMG25	SMG50	SMG50	SMG100	SMG150	SMG200
3000-4000 cps	SMD33	SMG50	SMG75	SMG100	SMG200	C/F
5000 cps	SMG100	SMG150	C/F	C/F	C/F	C/F
Shear Sensitive (Polymers)	C/F	SMG25V	SMG50V	SMG100V	SMG150V	C/F

Blend times for the selections above are generally 5-15 minutes.
C/F = Consult Factory Representative
V =Variable speed

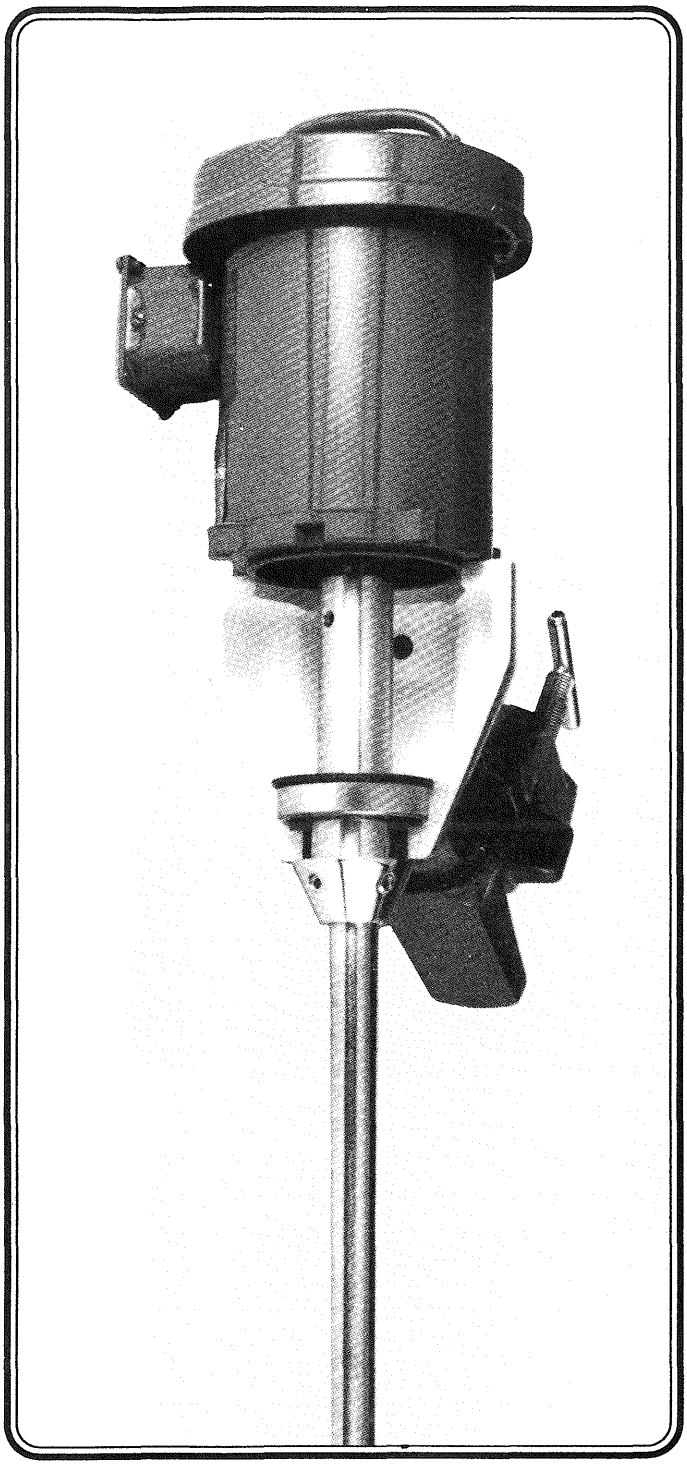
Liquid - Solids/Slurries

PERCENT SOLIDS BY WEIGHT	VOLUME GALLONS					
	30-50	75-100	200-400	500-750	1000-1500	2000-3000
5 - 10%	SMD25	SMD25	SMD50	SMD100	SMG33	SMG75
15 - 20%	SMD33	SMD75	SMD100	SMD200	SMG150	C/F
25 - 40%	SMD50	SMD100	SMG50	SMG100	C/F	C/F
50 - 75% (Ceramic slip)	SMG25	SMG50	SMG100	SMG150	C/F	C/F

1. For "wetting" light solids, position mixer prop near center of tank to produce a vortex.
2. For "flocculation" or "solid dispersion" consult factory representative.
3. Whenever liquid depth to tank diameter ratio exceeds .75 use dual props.

Waste Treatment Mixer Selections

TANK VOLUME GALLONS	WASTE FLOW RATE (GPM)			
	10	25	50	100
100	C/F	SMD25	SMD33	SMD50
250	SMD25	SMD25	SMD33	SMD50
500	SMD33	SMD50	SMD100	SMG33
1000	SMG25	SMG25	SMG33	SMG50
2000	SMG33	SMG50	SMG50	SMG75
3000	SMG50	SMG75	SMG100	SMG 100



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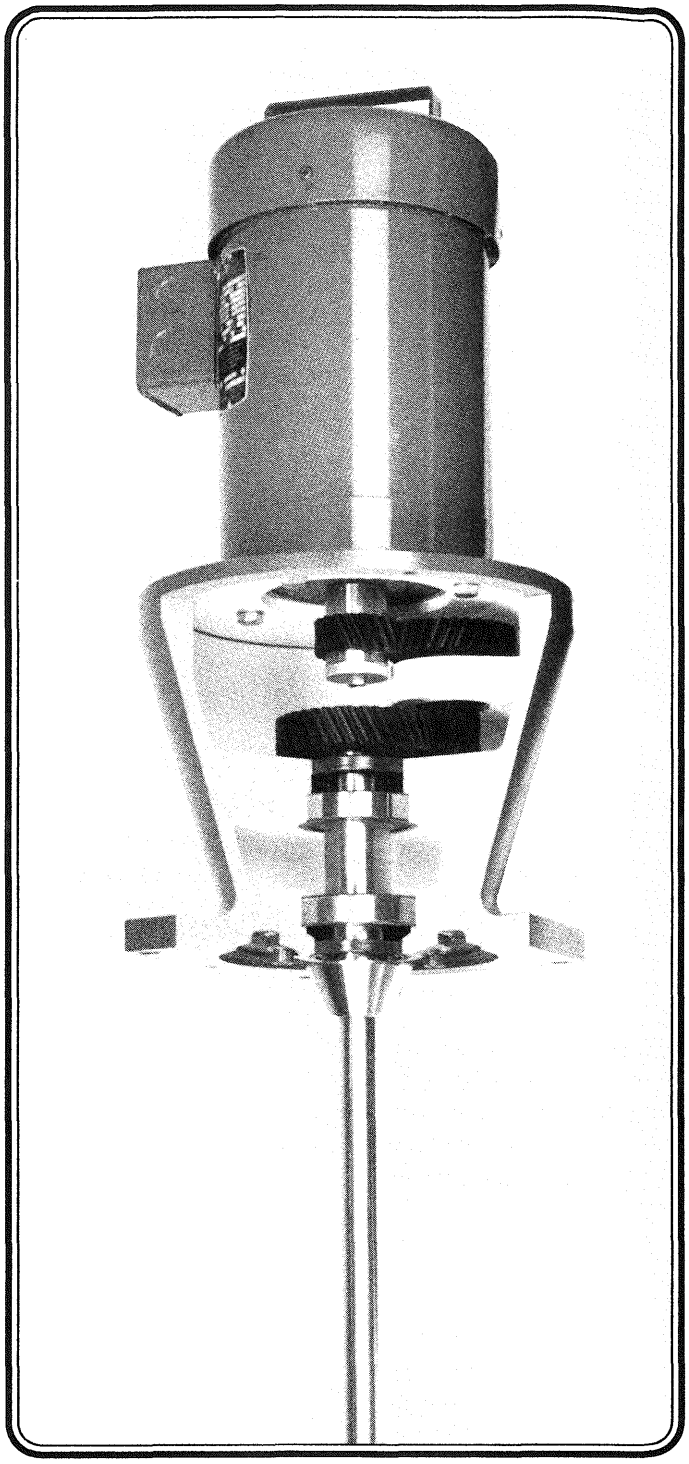

SERIES SMG

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