

Aeration Systems

Conversion Chart For Upgrading Systems With Advanced Technology Diffuser Units

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Bulletin Brief**Technical Presentation**

Systems operating with the following types of diffuser systems are proper candidates for economical upgrade to EDI Advanced Technology Membrane Diffuser Units:

1. Coarse Bubble Systems Major Energy Savings Are Possible When Converting All Coarse Bubble Units Including:
 - a. Static Tubes
 - b. Wide Band
 - c. Snap Cap
 - d. All Others

Projected energy savings is approximately 50 to 70% from use of EDI advanced technology membrane diffusers!

2. Ceramic Diffusers – because of low air flow limitations of ceramic diffusers, more membrane diffusers can be added to reduce flux rate with major efficiency gains. Note, membrane diffusers may also be selected to reduce maintenance of existing ceramic systems. Membranes are routinely replacing ceramic diffusers for high efficiency on/off operation.

Projected energy savings of 10 to 30%.

3. Medium Bubble Diffusers-major energy savings are available with projected savings of 25 to 50%

4. Existing Fine Bubble Membrane Systems
 - a. Minimum number of diffusers at high air flow each.

Fine pore units at high flux rates operate at similar efficiencies of medium bubble units. Increasing area of high quality diffusers (reduced air flux) greatly improves oxygen transfer.

Potential energy savings of 25 to 50%.

b. Fine Pore diffusers with Lift Out Side Roll Configuration –

The geometry of diffuser placement has major impact on diffuser efficiency (See EDI Technical Bulletin Number 139 for more details). Proper distribution of diffusers into grid or uniform floor cover can produce major energy savings of 15 to 25%.

Note: a combination of item 4a and 4b can result in energy savings of 30 to 50%.

Any time energy savings are available an analysis will determine if it is economical to convert to high efficiency advanced technology membrane diffusers by EDI. See EDI Technical Bulletin Number 126 for economic evaluation details.

A chart shown below shows energy savings resulting from each horsepower (0.746 Kwh) of power saved when converting to EDI high efficiency systems.

Energy Cost In cents/Kwh	Annual Savings per Hp energy saved *
4¢	\$261/yr
5¢	\$327/yr
6¢	\$392/yr
7¢	\$457/yr
8¢	\$523/yr
10¢	\$653/yr
12¢	\$784/yr
14¢	\$915/yr

*1 Hp Saving = 0.746 Kwh (\$/kwh) (8760 hr/yr)

Example - Conversion of existing system from coarse bubble to EDI advanced technology membrane diffusers reduces horsepower use at the plant from 300 Hp to 150 hp. Power @8¢/KwH. Annual Savings = 150 Hp (\$523/yr)=\$38,460/yr.

Proper economic evaluation requires present worth analysis of energy savings versus upgrade cost. A typical present worth analysis* for interest rate of 6% over 20 years shows you can spend up to \$441,136 for converting your plant to EDI high efficiency diffusers to save 150 Hp with energy at 8¢/KwH.

*Present Worth Factor for interest at 6% over 20 year life is 11.47 x annual savings.

For specific information on aeration system selection considerations and detailed present worth analysis, contact Environmental Dynamics Inc. at (573) 474-9456.

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