

Buoyancy of OTT membrane tubediffusers

MAGNUM® membrane tubediffuser
STANDARD® membrane tubediffuser



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OTT tube diffusers have low buoyancy due to the design and the flooded inner compartment of the tubes. However, the material of the diffusers and the air between the diffuser body and membrane cause buoyancy. The attached table shows the weight and the buoyancy of OTT diffusers. It furthermore mentions ballast types and weights that must be used to neutralize the buoyancy of the diffusers.

The buoyancy has been calculated and measured in the laboratory of OTT GmbH. All data is valid for the mentioned products of OTT only and can not be used for other brands.

OTT diffuser types	diffuser weight	Repressed water volume in operation	Resulting buoyancy of diffuser in operation	Minimum ballast made of concrete $\rho = 2 \text{ kg/l}$ $k_{\text{safety}} = 2$	Minimum ballast made of stainless steel $\rho = 7.9 \text{ kg/l}$ $k_{\text{safety}} = 2$
1 MAGNUM 1000 or 2 STANDARD 500	1.6 kg 3.53 lbs	2.6 l	1,000 g 2.20 lbs	4,000 g 8.8 lbs	2,400 g 5.2 lbs
1 MAGNUM 1500 or 2 STANDARD 750	ca. 2.3 kg 5.07 lbs	3.7 l	ca. 1,400 g 3.1 lbs	5,600 g 12.8 lbs	3,300 g 7.2 lbs
MAGNUM 2000 or 2 STANDARD 1000	ca. 2.7 kg 5.95 lbs	4.6 l	ca. 1,900 g 4.2 lbs	7,600 g 17.2 lbs	4,500 g 10.0 lbs

The data in the table are based on complete diffusers as supplied by the factory. The ballast values include a safety factor k_{safety} of 2. The stated weights are sufficient for to neutralize the buoyancy of the mentioned diffusers.

Additional buoyancy of the down pipes and aeration grids (headers) has to be calculated separately, and must be added to the buoyancy of the diffusers. Please, consider also the influence of mixers and possible air lift effects for the design of the ballast. These factors can cause uplifting forces.

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