C3 STRESS ANALYSIS OF FIXED DOME BIOGAS DIGESTORS

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Stress analysis of a fixed dome biogas digestor was carried out in order to design a digestor considering the different systems of loading to which the digestor is subjected to during construction and use. The digestor is to be constructed using low cost precast blocks such as bricks. The more significant structural components of the digestor are : (a) the dome of the gas holder; (b) the wall of the fermentation tank; (c) the base of the fermentation tank.

The analysis has been completed for (a) and (b). The results indicate that the stresses are high in the region where the dome of the gas holder and the wall of the fermentation tank interconnects. These stresses die out within a short distance on both the fermentation tank and the dome.

References

1. Flugge, W. (1973) Stresses in shells, 2 nd ed., Springer - Verlag, Berlin.
2. Timoshenko, S. & Woinowsky - Krieger, S. (1959) Theory of plates & shells 2nd ed. McGraw - Hill, New York