

# ANAEROBIC DIGESTER

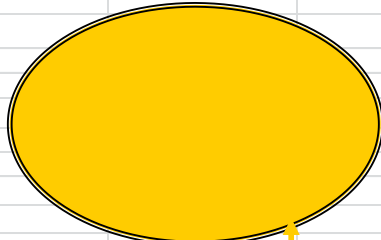
## GAS PRODUCTION

1) GAS PROD BASED ON BOD LOAD	Value	Unit
BOD5thickened sludge	3,990	kg/d
BODLo of thickened sludge	5,868	
SRT of Anaerobic Process	20.00	d
Px (of digestion)	165	kg/d
Volume of methane	1,766	m <sup>3</sup> /d
Digester gas produced (based on BODL)	2,944	m <sup>3</sup> /d
2) GAS PROD BASED ON VSS LOAD		
Gas production Rate, m <sup>3</sup> /kg VSS load	0.6	(0,5-0,75)
Gas Produced	4,446	m <sup>3</sup> /day
3) GAS PROD BASED ON VSS DESTROYED		
Gas production Rate, m <sup>3</sup> /kgVSS destroyed	0.9	(0,75-1,12)
Gas Produced	3,468	m <sup>3</sup> /day
4) GAS PROD BASED ON CAPITA		
Gas production Rate, m <sup>3</sup> /capita	0.032	(0,03-0,04)
Gas produced	26,667	m <sup>3</sup> /day
Selected Digester gas produced	123	m <sup>3</sup> /h
Min	2,944	m <sup>3</sup> /day
Max	4,446	m <sup>3</sup> /day

$$= Y \cdot \text{Effic} \cdot \text{BODL} / (1 + kd \cdot \text{SRT})$$

$$= (m^3 \text{CH}_4 / \text{kg BODL}) \cdot (\text{Effic} \cdot \text{BODL}_{\text{sludge}} - 1.42 \cdot P_x)$$

$$= \text{Vol CH}_4 / (\% \text{ CH}_4 \text{ in Dig Gas})$$



GAS STORAGE SPHERE	
Total Gas Storage Days:	3 d
Total Gas Stored(at STP; 0oC,1atm)	8831.450597 m <sup>3</sup>
No of Storage Tanks:	1
Storage Pressure:	5 atm
Storage temp:	50 oC
Storage Volume	2089.786478 m <sup>3</sup>
Diameter of Sphere:	15.86234625 m
Selected Diameter:	45 m
Calculated Volume of Sphere	47713.05 m <sup>3</sup>

DIGESTER GAS COM PRESSOR	
Gas Produced at STP:	0.034095139 kg/s
Gas Compressed/Gas Productn Rat	1.5
Gas Compressed	0.051142709 kg/s
High Press Gas Compres Power:	11.70568016 kW
	15.63878869 hP

Digester Gas, m<sup>3</sup>/h=  
**123**

SensibeHeat req for raw sludge **22,024,800,000** J/d **254.9** kW