Important Capacity of Distribution Reservoir Formulas PDF

Formulas
Examples
with Units

List of 8
Important Capacity of Distribution Reservoir Formulas

1) Average Domestic Demand given Total Storage Capacity Formula

Evaluate Formula

Formula

$$D = \frac{T - \left(\left(\frac{10}{24}\right) \cdot \left(F - P\right)\right)}{a + b + \left(\frac{10}{24}\right)}$$

Example with Units

$$134.9953\,\text{L/d} = \frac{505.08\,\text{L/d} - \left(\left(\frac{10}{24}\right) \cdot \left(1100\,\text{L/d} - 120\,\text{L/d}\right)\right)}{0.2 + 0.1 + \left(\frac{10}{24}\right)}$$

2) Fire Demand given Reserve Storage Formula

Evaluate Formula

Formula

$$F = \left(\frac{V_R}{t}\right) + P$$

Example with Units

$$1100\,\text{L/d} = \left(\frac{1960\,\text{L}}{2\,\text{d}}\right) + 120\,\text{L/d}$$

3) Fire Demand given Total Storage Capacity Formula

Evaluate Formula

Formula

$$F = \frac{T - \left(\left(a + b + \left(\frac{10}{24}\right)\right) \cdot D\right) + \left(\left(\frac{10}{24}\right) \cdot P\right)}{\frac{10}{24}}$$

Example with Units

$$1099.992\,\text{L/d} = \frac{505.08\,\text{L/d} - \left(\left(0.2 + 0.1 + \left(\frac{10}{24}\right)\right) \cdot 135\,\text{L/d}\right) + \left(\left(\frac{10}{24}\right) \cdot 120\,\text{L/d}\right)}{\frac{10}{24}}$$

4) Fire Demand given Value of McDonald Coefficient Formula

Evaluate Formula

Formula

$$F = \frac{T - \left(\left(0.2 + 0.1 + \left(\frac{10}{24}\right)\right) \cdot D\right) + \left(\left(\frac{10}{24}\right) \cdot P\right)}{\frac{10}{24}}$$

Example with Units

$$1099.992\,\text{L/d} = \frac{505.08\,\text{L/d} - \left(\left(0.2 + 0.1 + \left(\frac{10}{24}\right)\right) \cdot 135\,\text{L/d}\right) + \left(\left(\frac{10}{24}\right) \cdot 120\,\text{L/d}\right)}{\frac{10}{24}}$$

5) Fire Duration given Reserve Storage Formula

Evaluate Formula

Formula

$$t = \frac{V_R}{F - P}$$

Example with Units

$$2\,\text{d} = \frac{1960\,\text{L}}{1100\,\text{L/d} - 120\,\text{L/d}}$$

6) Reserve Fire Pumping Capacity given Reserve Storage Formula

Evaluate Formula

Formula

$$P = F - \left(\frac{V_R}{t}\right)$$

Example with Units

$$120\,\text{L/d} = 1100\,\text{L/d} - \left(\frac{1960\,\text{L}}{2\,\text{d}}\right)$$

7) Reserve Storage Formula

Evaluate Formula

Formula

$$V_R = (F - P) \cdot t$$

Example with Units

$$1960\,\text{L} = (1100\,\text{L/d} - 120\,\text{L/d}) \cdot 2\,\text{d}$$

8) Total Storage Capacity of Reservoir Formula

Evaluate Formula

Formula

$$T = \left(a + b + \left(\frac{10}{24}\right)\right) \cdot D + \left(\frac{10}{24}\right) \cdot (F - P)$$

Example with Units

$$505.0833\,\text{L/d} = \left(0.2 + 0.1 + \left(\frac{10}{24}\right)\right) \cdot 135\,\text{L/d} + \left(\frac{10}{24}\right) \cdot (1100\,\text{L/d} - 120\,\text{L/d})$$

Variables used in list of Capacity of Distribution Reservoir Formulas above

- **a** Numerical Coefficient a
- **b** Numerical Coefficient b
- **D** Average Domestic Demand *(Liter per day)*
- **F** Fire Demand *(Liter per day)*
- **P** Capacity of Pump *(Liter per day)*
- **t** Duration of Fire *(Day)*
- **T** Total Storage Capacity *(Liter per day)*
- V_R Reserve Storage *(Liter)*

Constants, Functions, Measurements used in list of Capacity of Distribution Reservoir Formulas above

- Measurement: **Time** in Day (d)
  Time Unit Conversion
- Measurement: **Volume** in Liter (L)
  Volume Unit Conversion
- Measurement: **Volumetric Flow Rate** in Liter per day (L/d)
  Volumetric Flow Rate Unit Conversion

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