

Important Scraper Production Formulas PDF



Formulas Examples with Units

List of 25 Important Scraper Production Formulas

1) Bank or Quantity of Scrap Produced Formula

Formula

$$B = \left(\frac{W_{\text{load}}}{\rho_m} \right)$$

Example with Units

$$9.4 \text{ m}^3 = \left(\frac{10.34 \text{ kg}}{1.1 \text{ kg/m}^3} \right)$$

Evaluate Formula 

2) Cycle Time given Trips per Hour for Excavating Scrap Formula

Formula

$$C_t = \left(\frac{W_T}{f} \right)$$

Example with Units

$$5.7 \text{ h} = \left(\frac{22.8}{4 \text{ rev/h}} \right)$$

Evaluate Formula 

3) Density of Material given Quantity of Scrap Produced Formula

Formula

$$\rho_m = \left(\frac{W_{\text{load}}}{B} \right)$$

Example with Units

$$1.0551 \text{ kg/m}^3 = \left(\frac{10.34 \text{ kg}}{9.8 \text{ m}^3} \right)$$

Evaluate Formula 

4) Haul Distance in Feet given Variable Time Formula

Formula

$$H_{ft} = \left(T_v \cdot 88 \cdot S_{\text{mph}} \right) - R_{ft}$$

Example with Units

$$66.396 \text{ ft} = \left(0.2 \text{ min} \cdot 88 \cdot 0.045 \text{ mi/h} \right) - 3.3 \text{ ft}$$

Evaluate Formula 

5) Haul Distance in Meter given Variable Time Formula

Formula

$$h_m = \left(T_v \cdot 16.7 \cdot S_{\text{kmph}} \right) - R_{\text{meter}}$$

Example with Units

$$6.8043 \text{ m} = \left(0.2 \text{ min} \cdot 16.7 \cdot 0.149 \text{ km/h} \right) - 1.49 \text{ m}$$

Evaluate Formula 

6) Load Given Production of Scrap by Machines Formula

Formula

$$L = \left(\frac{P_s}{f} \right)$$

Example with Units

$$18.75 \text{ m}^3 = \left(\frac{75.00 \text{ m}^3/\text{hr}}{4 \text{ rev/h}} \right)$$

Evaluate Formula 

7) Number of Scrapers Needed for Job Formula

Formula

$$N = \left(\frac{P_s}{P_u} \right)$$

Example with Units

$$6.8182 = \left(\frac{75.00 \text{ m}^3/\text{hr}}{11 \text{ m}^3/\text{hr}} \right)$$

Evaluate Formula 

8) Number of Scrapers Pusher can Load Formula

Formula

$$N_p = \left(\frac{T_s}{T_p} \right)$$

Example with Units

$$2.392 = \left(\frac{7.2 \text{ min}}{3.01 \text{ min}} \right)$$

Evaluate Formula 

9) Production of Scrap by Machines Formula

Formula

$$P_s = (L \cdot f)$$

Example with Units

$$72.8 \text{ m}^3/\text{hr} = (18.2 \text{ m}^3 \cdot 4 \text{ rev/h})$$

Evaluate Formula 

10) Production per Unit Given Number of Scrapers Needed for Job Formula

Formula

$$P_u = \left(\frac{P}{N} \right)$$

Example with Units

$$2.4776 \text{ m}^3/\text{hr} = \left(\frac{4.98 \text{ m}^3/\text{hr}}{2.01} \right)$$

Evaluate Formula 

11) Production Required given Number of Scrapers Needed for Job Formula

Formula

$$P_s = N_s \cdot P_u$$

Example with Units

$$77 \text{ m}^3/\text{hr} = 7.0 \cdot 11 \text{ m}^3/\text{hr}$$

Evaluate Formula 

12) Production Required to Determine Number of Scrapers Formula

Formula

$$P_s = \left(\frac{B_{sp}}{t_{hr}} \right)$$

Example with Units

$$73.0159 \text{ m}^3/\text{hr} = \left(\frac{184 \text{ m}^3}{2.52 \text{ h}} \right)$$

Evaluate Formula 

13) Pusher Cycle Time given Number of Scrapers Pusher can Load Formula

Formula

$$T_p = \left(\frac{T_s}{N_p} \right)$$

Example with Units

$$0.6 \text{ min} = \left(\frac{7.2 \text{ min}}{12} \right)$$

Evaluate Formula 

14) Quantity given Production Required Formula

Formula

$$B_{sp} = (P_s \cdot t_{hr})$$

Example with Units

$$189 \text{ m}^3 = (75.00 \text{ m}^3/\text{hr} \cdot 2.52 \text{ h})$$

Evaluate Formula 



15) Return Distance in Feet given Variable Time Formula

Formula

$$R_{ft} = (T_v \cdot 88 \cdot S_{mph}) - H_{ft}$$

Example with Units

$$2.776 \text{ ft} = (0.2 \text{ min} \cdot 88 \cdot 0.045 \text{ mi/h}) - 66.92 \text{ ft}$$

Evaluate Formula 

16) Return Distance in Meter given Variable Time Formula

Formula

$$R_{meter} = (T_v \cdot 16.7 \cdot S_{kmph}) - h_m$$

Example with Units

$$1.8943 \text{ m} = (0.2 \text{ min} \cdot 16.7 \cdot 0.149 \text{ km/h}) - 6.40 \text{ m}$$

Evaluate Formula 

17) Scraper Cycle Time given Number of Scrapers Pusher can Load Formula

Formula

$$T_s = (N_p \cdot T_p)$$

Example with Units

$$36.12 \text{ min} = (12 \cdot 3.01 \text{ min})$$

Evaluate Formula 

18) Speed at Haul and Return in Kilometer per Hour given Variable Time Formula

Formula

$$S_{kmph} = \frac{h_m + R_{meter}}{16.7 \cdot T_v}$$

Example with Units

$$0.1417 \text{ km/h} = \frac{6.40 \text{ m} + 1.49 \text{ m}}{16.7 \cdot 0.2 \text{ min}}$$

Evaluate Formula 

19) Speed at Haul and Return in Miles per Hour given Variable Time Formula

Formula

$$S_{mph} = \frac{H_{ft} + R_{ft}}{88 \cdot T_v}$$

Example with Units

$$0.0453 \text{ mi/h} = \frac{66.92 \text{ ft} + 3.3 \text{ ft}}{88 \cdot 0.2 \text{ min}}$$

Evaluate Formula 

20) Trips per Hour for Excavating Scrap Formula

Formula

$$f = \left(\frac{W_T}{C_t} \right)$$

Example with Units

$$3.8 \text{ rev/h} = \left(\frac{22.8}{6 \text{ h}} \right)$$

Evaluate Formula 

21) Trips per Hour given Production of Scrap by Machines Formula

Formula

$$f = \left(\frac{P_s}{L} \right)$$

Example with Units

$$4.1209 \text{ rev/h} = \left(\frac{75.00 \text{ m}^3/\text{hr}}{18.2 \text{ m}^3} \right)$$

Evaluate Formula 

22) Variable Time when Haul and Return Distance is in Feet Formula

Formula

$$T_v = \frac{H_{ft} + R_{ft}}{88 \cdot S_{mph}}$$

Example with Units

$$0.2015 \text{ min} = \frac{66.92 \text{ ft} + 3.3 \text{ ft}}{88 \cdot 0.045 \text{ mi/h}}$$

Evaluate Formula 



23) Weight of Load Given Quantity of Scrap Produced Formula

Formula

$$W_{\text{load}} = (B \cdot \rho_m)$$

Example with Units

$$10.78 \text{ kg} = (9.8 \text{ m}^3 \cdot 1.1 \text{ kg/m}^3)$$

Evaluate Formula 

24) Working Time given Production Required Formula

Formula

$$t_{\text{hr}} = \left(\frac{B_{\text{sp}}}{P_s} \right)$$

Example with Units

$$2.4533 \text{ h} = \left(\frac{184 \text{ m}^3}{75.00 \text{ m}^3/\text{hr}} \right)$$

Evaluate Formula 

25) Working Time given Trips per Hour for Excavating Scrap Formula

Formula

$$W_T = (f \cdot C_t)$$

Example with Units

$$24 = (4 \text{ rev/h} \cdot 6 \text{ h})$$









Evaluate Formula 



Variables used in list of Scraper Production Formulas above

- **B** Bank in Scraper (Cubic Meter)
- **B_{sp}** Bank in Scraper Production (Cubic Meter)
- **C_t** Cycle Time (Hour)
- **f** Trips per Hour (Revolution per Hour)
- **H_{ft}** Haul Distance in Feet (Foot)
- **h_m** Haul Distance (Meter)
- **L** Load in Scraper Production (Cubic Meter)
- **N** Number of Scraper
- **N_p** Number of Scraper a Pusher
- **N_s** Number of Scraper in Scraper Production
- **P** Production Required (Cubic Meter per Hour)
- **P_s** Production Required in Scraper Production (Cubic Meter per Hour)
- **P_u** Production per Unit (Cubic Meter per Hour)
- **R_{ft}** Return Distance in Foot in Scraper Production (Foot)
- **R_{meter}** Return Distance in Meter (Meter)
- **S_{kmpH}** Speed in Kmph in Scraper Production (Kilometer per Hour)
- **S_{mpH}** Speed in Miles per Hour in Scraper Production (Mile per Hour)
- **t_{hr}** Time in Scraper Production in Hour (Hour)
- **T_p** Pusher Cycle Time (Minute)
- **T_s** Scraper Cycle Time (Minute)
- **T_v** Variable Time in Scraper Production (Minute)
- **W_{load}** Weight of Load Scrap (Kilogram)
- **W_T** Working Time in Scraper Production
- **ρ_m** Density of Material in Scraper Production (Kilogram per Cubic Meter)

Constants, Functions, Measurements used in list of Scraper Production Formulas above

- **Measurement: Length** in Foot (ft), Meter (m)
Length Unit Conversion 
- **Measurement: Weight** in Kilogram (kg)
Weight Unit Conversion 
- **Measurement: Time** in Hour (h), Minute (min)
Time Unit Conversion 
- **Measurement: Volume** in Cubic Meter (m³)
Volume Unit Conversion 
- **Measurement: Speed** in Mile per Hour (mi/h), Kilometer per Hour (km/h)
Speed Unit Conversion 
- **Measurement: Frequency** in Revolution per Hour (rev/h)
Frequency Unit Conversion 
- **Measurement: Volumetric Flow Rate** in Cubic Meter per Hour (m³/hr)
Volumetric Flow Rate Unit Conversion 
- **Measurement: Density** in Kilogram per Cubic Meter (kg/m³)
Density Unit Conversion 



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