# Bulldozer and Ripper Production per Hour

Dozer blade load in bank measure, push-spread-return cycle and hourly production, and ripper production from pass length, spacing and depth.

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Blade capacity (loose) | 22.000 | m³ |
| Swell factor (bank per loose) | 0.75000 | |
| Dozing method | Single blade | |
| Load (cut) time | 0.30000 | min |
| Push distance | 60.000 | m |
| Push speed | 1.2000 | m/s |
| Spread time | 0.10000 | min |
| Return speed | 2.2000 | m/s |
| Operating efficiency | 75.000 | % |
| Ripping pass length | 100.00 | m |
| Spacing between ripper passes | 1.0000 | m |
| Ripper penetration | 0.80000 | m |
| Ripping speed | 30.000 | m/min |
| Turn time per pass | 0.25000 | min |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Dozer load (bank) | 16.500 | m³ |
| Dozer cycle time | 1.6879 | min |
| Dozer production (bank) | 439.90 | m³/h |
| Ripper cycle time | 3.5833 | min |
| Ripper production (bank) | 1,004.7 | m³/h |

**Notes for this case**

- Pushing is in first or second gear at 0.8-1.7 m/s and reversing at about 2.2 m/s for crawlers; production dozing is economical to about 80 m. Ripping runs at 25-40 m/min with 0.20-0.35 min turns (Hays).

## Formula and method

$$L_h = C_{bd}\,SF\ (\times 1.2 \text{ slot}), \quad P_d = \frac{60 L_h E}{T_{ld} + D/V_p + T_{sp} + D/V_r}, \quad P_r = \frac{60\,l\,w\,d\,E}{T_{cr}}$$

### Variables

| | | |
|---|---|---|
| $C_{bd}$ | Blade capacity (loose) | m³ |
| $SF$ | Swell factor (bank per loose) | - |
| $\text{method}$ | Dozing method | - |
| $T_{ld}$ | Load (cut) time | s |
| $D$ | Push distance | m |

| | | |
|---|---|---|
| $V_p$ | Push speed | m/s |
| $T_{sp}$ | Spread time | s |
| $V_r$ | Return speed | m/s |
| $E$ | Operating efficiency | - |
| $l$ | Ripping pass length | m |
| $w$ | Spacing between ripper passes | m |
| $d$ | Ripper penetration | m |
| $V_{rip}$ | Ripping speed | m/s |
| $T_t$ | Turn time per pass | s |
| $L_h$ | Dozer load (bank) | m³ |
| $TC_{ch}$ | Dozer cycle time | s |
| $P_d$ | Dozer production (bank) | m³/s |
| $T_{cr}$ | Ripper cycle time | s |
| $P_r$ | Ripper production (bank) | m³/s |

### Method and standards

Dozer and ripper production.

### Assumptions and limits

- Level ground; grades and material change the load.

## Report details

| | |
|---|---|
| Report reference | FCC-JBNV-GMC6 (the same inputs always give the same reference) |
| Generated | 23 November 2026, 17:26 UTC |
| Calculator | Bulldozer and Ripper Production per Hour |
| Method last reviewed | 17 November 2026 |
| Software release | FireCAD Calc, release of 22 November 2026 |
| Release checks | 3 reference cases of this calculator, computed independently, are checked on every release |

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

### This calculator online

https://calc.firecad.com/civil/mine-design/dozer-ripper-production

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.