# Haul Truck Tyre TKPH (Tonne-km per Hour) of the Work Site

Work-site TKPH of haul truck tyres from the empty and loaded tyre loads, cycle length and cycles per shift, to compare with the tyre's TKPH rating.

**Method:** Tyre maker's work-site TKPH method (mean load × mean speed of the shift)

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Load per tyre empty (tonnes) | 8.0000 | |
| Load per tyre loaded (tonnes) | 20.000 | |
| Cycle length (round trip, km) | 6.0000 | |
| Cycles per shift | 18.000 | |
| Shift length (hours) | 8.0000 | |
| Correction for long cycles and hot climate (1 = none) | 1.0000 | |
| Tyre TKPH rating (0 = skip check) | 500.00 | |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Mean tyre load (tonnes) | 14.000 | |
| Mean operating speed of the shift (km/h) | 13.500 | |
| Work-site TKPH | 189.00 | |
| Ratio to the tyre rating | 37.800 | % |

### Notes for this case

• Large earthmover tyres fail from heat build-up, which grows with load and speed. TKPH measures the work: the mean tyre load (average of empty and loaded) times the mean speed over the whole shift, including waiting and loading time. The site TKPH must not exceed the tyre's TKPH rating; tyre makers add corrections for long cycles and hot ambient temperatures (entered here as one factor). Check the most heavily loaded position, usually the rear duals or the front tyres when braking.

## Formula and method

$$Q_m = \frac{Q_e + Q_l}{2}, \quad V_m = \frac{L_c n}{t_s}, \quad TKPH_s = Q_m V_m k$$

### Variables

| | | |
|---|---|---|
| $Q_e$ | Load per tyre empty (tonnes) | - |
| $Q_l$ | Load per tyre loaded (tonnes) | - |
| $L_c$ | Cycle length (round trip, km) | - |
| $n$ | Cycles per shift | - |
| $t_s$ | Shift length (hours) | - |
| $k$ | Correction for long cycles and hot climate (1 = none) | - |
| $TKPH_r$ | Tyre TKPH rating (0 = skip check) | - |
| $Q_m$ | Mean tyre load (tonnes) | - |
| $V_m$ | Mean operating speed of the shift (km/h) | - |
| $TKPH_s$ | Work-site TKPH | - |
| $TKPH_s / TKPH_r$ | Ratio to the tyre rating | - |

### Method and standards

TKPH.

### Assumptions and limits

- Shift averages; corrections from the tyre maker.

### References

Tyre maker's work-site TKPH method (mean load × mean speed of the shift)

## Report details

| | |
|---|---|
| Report reference | FCC-NTHN-J74E (the same inputs always give the same reference) |
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| Calculator | Haul Truck Tyre TKPH (Tonne-km per Hour) of the Work Site |
| 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/automotive/tyres-wheels/tyre-tkph-rating

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.