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Guide to Calculating OTR Tires TKPH



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(Tonne Kilometre Per Hour)

Introduction:

TKPH, or Tonne Kilometre Per Hour, is a critical metric for evaluating the performance of Off-The-Road (OTR) tires. It reflects the load capacity of a tire in relation to heat generation, which is essential for ensuring optimal performance and longevity.

Importance of TKPH:

Understanding TKPH is vital for selecting the appropriate tire for specific operational conditions. A tire's TKPH rating helps predict its performance under various loads and speeds, allowing operators to avoid overheating and premature wear.

Formula for Calculating TKPH:

The basic formula for calculating TKPH is as follows:

$$TKPH = \frac{(Q_{loaded} + Q_{empty})}{2} \times (N \times L) / H$$

Where:

Q_{loaded} = Load per tire on the loaded vehicle (in kg)

Q_{empty} = Load per tire on the empty vehicle (in kg)

N = Number of cycles per working day

L = Length per cycle in kilometers (round trip)

H = Number of operating hours per day



Example Calculation

1. Determine Loads and Parameters:

- Loaded weight per tire: 15,000 kg
- Empty weight per tire: 9,000 kg
- Operating hours per day: 8 hours
- Number of cycles per day: 15 cycles
- Distance per cycle: 14 km

2. Calculate Average Load:

$$\text{Average Load} = \frac{(15,000 + 9,000)}{2} = 12,000 \text{ Kg}$$

3. Calculate Average Speed:

$$\text{Average Speed} = \frac{(14 \text{ Km} \times 15)}{8} = 26.25 \text{ Km h}$$

4. Calculate TKPH:

$$\text{TKPH} = 12,000 \text{ kg} \times 26.25 \text{ kg h} = 315,000 \text{ Kg Km h}$$

*Converting to tonnes:

$$\text{TKPH} = 315 \text{ TKPH}$$



Important Considerations

Tire Specifications:

Ensure that the selected tire's TKPH rating exceeds the calculated TKPH to avoid overheating and premature wear.

Environmental Factors:

Adjust calculations based on ambient temperature and other operational conditions. For instance, if temperatures exceed 38°C, reduce the TKPH by approximately 2% for each degree above this threshold.

Conclusion

Calculating TKPH is essential for optimizing tire selection and ensuring operational efficiency in heavy machinery. By following the outlined steps and considering environmental factors, operators can make informed decisions that enhance tire performance and reduce costs.