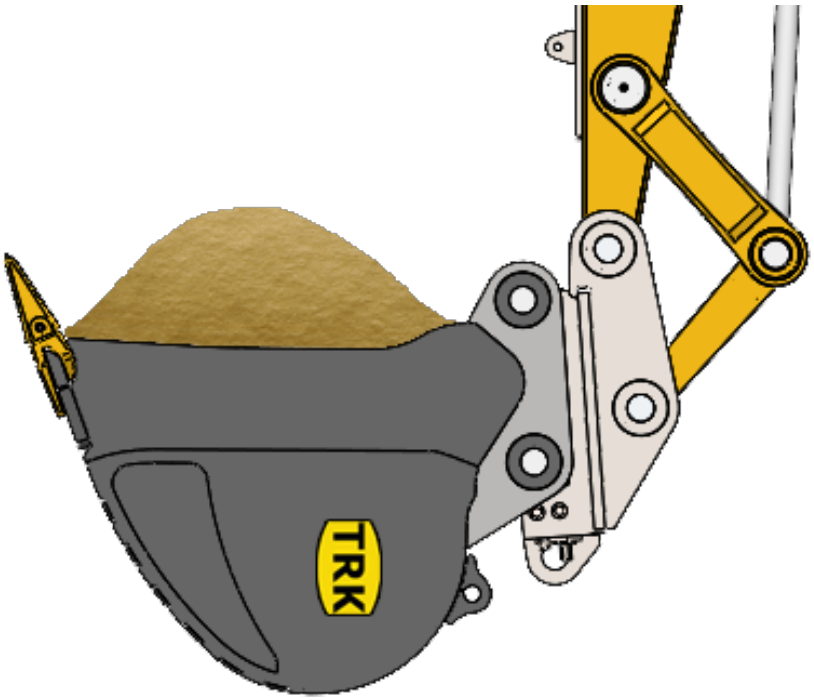
TECHNICAL ARTICLE
TA-TRK-004

# HOW TO CALCULATE BUCKET CAPACITY

## Choosing the right bucket for the job




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Bucket capacity is the volume of material an excavator bucket is designed to hold. It is one of the primary specifications used to describe and compare buckets.

One thing to keep in mind is that the published capacity of any bucket is a theoretical maximum. The actual fill is often lower due to material type, operator technique, and digging conditions.

### 1) Calculate Cycles:

When the bucket starts digging in, start timing and stop the timer when it starts digging on the next load. Divide 60 by the number of minutes. This will give you the cycles per hour. For example, if the digging operation takes 0.75 minutes, you have 80 cycles per hour.

### 2) Calculate the Required Load per Cycle:

Divide the hourly production demand by the number of cycles per hour. For example, if 600 tons are required to be moved per hour and the average is 80 cycles per hour, you will need to move 7.5 tons per cycle.

### 3) Determine Material Density and Fill Factor:

Using a reliable source, find the standard weight of the material you will need to lift as well as the fill factor for the bucket. Based on material density, these values will indicate how much of a certain material the bucket can hold.

### 4) Find the Nominal Capacity:

Divide the per cycle payload by the material density found in the last step. This will give you the nominal capacity of the bucket.

### 5) Calculate the Required Bucket Capacity:

Divide the nominal bucket capacity from Step 4 by the fill factor for the bucket from Step 3. This will give you the required bucket capacity for whatever material you will be moving.

Bucket capacity is measured in two different ways; Heaped capacity for materials that build up into piles, and Struck capacity for moist materials that spread out and lie flat. See figure 1 and 2 below.

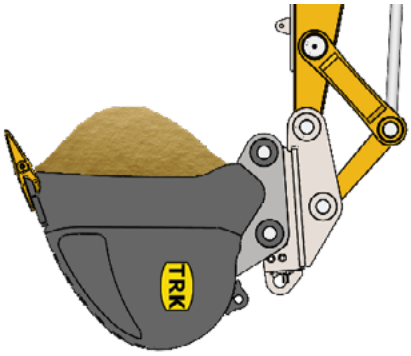



Figure 1 shows heaped capacity, which is the bucket volume plus unlevelled material volume.

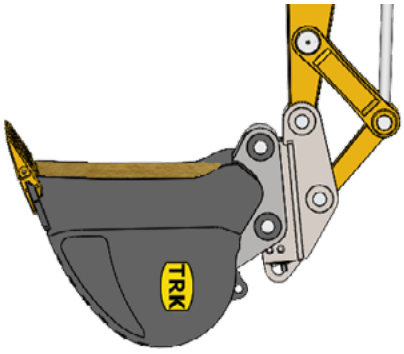



Figure 2 shows struck capacity, which is the bucket's volume upon leveling across the strike plane/bucket top.