

**STARTING RESISTANCE** is the force required to set the wheel in motion from a stationary position.

**ROLLING RESISTANCE** is the force required to keep the wheel in constant motion. This resistance is dependent upon the load, wheel diameter, tread material, bearing type, caster offset and floor surface and temperature.

**SWIVEL RESISTANCE** is determined by the swivel bearing sizes, ball diameters and ball race diameters.

**HARD WHEELS** will not flatten under load, thus better rollability. However, the hard wheel has difficulty starting with particles, holes or obstacles in or on the floor.

**RESILIENT WHEELS** move more easily over obstruction as they deform and roll over the obstructions. On the other hand a flat area, instead of a line, is in contact with the floor and thus the resistance to rolling is greater.

In general, the larger the wheel, the easier it rolls. Wheels with Precision Ball Bearings carry greater loads and are the easiest to roll. Roller bearing wheels carry heavy loads, but do not roll as easy. When possible, use the largest precision wheel for the best rollability. Any of these factors have an impact on the mobility and easy handling of the equipment or machine. Listed below is a comparative chart regarding rolling resistance of different type treads

**TRACTIVE RESISTANCE** is the effort required to either push or pull a cart or truck along in a straight line or to maneuver it in confined spaces.

The following table should be an aid to determine how many people are required to move and control a cart or truck in normal workshop conditions.

Wheel Type	Tractive Resistance
Steel or Nylacron™	Less than 1%
Urethane	Less than 2%
Elastic Rubber	Less than 3%

The above figures are based on roller bearing wheels 8" diameter. Wheels with proper size precision bearing wheels have lower tractive resistance, since they have better rollability.

Tractive Resistance will vary approximately in inverse proportion to the diameter, down to a minimum of 5".

It should be noted that a typical person is capable of maintaining a horizontal force of 26 lbs increasing to about 40 lbs from a standing start.

Urethane wheels if left standing for a long time, could require at least twice the force to initiate movement and its tractive resistance will increase momentarily up to about seven times the figure given above.

