**Motor Calculations**

**- Calculation of the motor maximum rpm:**

The vehicle is required to operate at a speed ≥ 5 [m/min]

The diameter is 65 mm

Since,

**w =** = = 2.56 [rad/sec]

Since the motor rpm **N =**

The motor rpm **N** = = 24.45 [rpm]

**- Calculation of the motor required torque :**

The friction force applied on each tire (**Fr**) is calculated from the following equation:

**Fr = Cr × Fn = Cr ( )**

Where:

**Cr:** coefficient of friction between wheel and floor

**W:** is the mass which wheel carry

**r:** number of tires

**Fn:** reaction force

For a rubber tire on dry concrete **Cr** = 0.68 (using friction table for different tire materials and road qualities)

Weight = 3.2 kg

**Fr** =

Motor torque

**Note**: Since the vehicle speed is small , the air resistance was neglected.