Flywheel – It is used in machines to serve as a reservoir which store energy during the period when the supply of energy is more than the requirement and released it during the period when the requirement of energy is more than the supply.

Types of Flywheel:

(1) Disc type.
(2) Rim type.

Energy stored by flywheel

Let

N_1 = Maximum speed during the cycle

N_2 = Minimum speed during the cycle

N = Mean speed of flywheel

$$= \frac{N_1 + N_2}{2}$$

and

C_s = Co-efficient of fluctuation of speed

$$= \frac{N_1 - N_2}{N}$$

The mean kinetic energy of the flywheel

$$E = \frac{1}{2} I \omega^2 = \frac{1}{2} m k^2 \omega^2$$

$$\boxed{I = mk^2}$$

The maximum fluctuation of energy of flywheel

$$\Delta E = \text{Maximum } KE - \text{Minimum } KE$$

$$= \frac{1}{2} I \omega_1^2 - \frac{1}{2} I \omega_2^2 = \frac{1}{2} I (\omega_1^2 - \omega_2^2)$$

$$= \frac{1}{2} m k^2 (\omega_1 + \omega_2)(\omega_1 - \omega_2)$$

$$m k^2 \left(\frac{\omega_1 + \omega_2}{2}\right) \frac{\omega_1 - \omega_2}{\omega} (\omega)$$

$$= m k^2 \omega^2 C_s \qquad \left(\because C_s = \frac{\omega_1 - \omega_2}{\omega}\right)$$

$$= m k^2 \left(\frac{2\pi N}{60}\right)^2 C_s$$

$$\boxed{\Delta E = \frac{\pi^2}{900} m k^2 N^2 C_s}$$