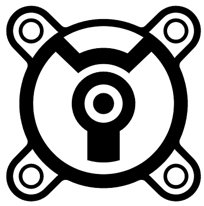
General Notes

- For calculation purposes the rotation speed of the dashpot is given in RADIANS per second (1 radian = 57.3°). The significance of a radian is that if, for example, a 1 metre radius lever rotates through 1 radian, the end of the lever moves 1 metre, a distance equal to the radius.
- Damping RATE is defined here as TORQUE divided by ROTATION SPEED. Note that a dashpot with a high rate may not necessarily be working at a high torque. For example, may have a rate of 100 Nm/rad/s; however, it may be rotated at 1/10 rad/s so that the damping torque produced is 10 Nm which is not numerically equal to the rate.

Dashpot Selection

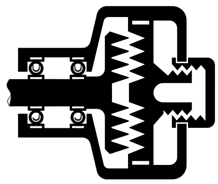
- To select a suitable dashpot for an application, the suggested procedure is to first establish the RATE required. Most applications can be reduced to one of the cases shown opposite. The formula concerned will give the RATE.
- Having established the rate required, the type of dashpot (vane or continuous rotation) must be selected. This usually depends on the angle of travel required.
- It is recommended that initially an adjustable dashpot is used in an application. This allows the exact damping rate to be established. Subsequent units can then be supplied with fixed rates based on measurement of the adjustable unit as set on the application.

Vane Dashpots - (High rate, restricted travel)



- Establish the rate from the formula for one of the cases opposite (or otherwise).
- Check that the maximum shaft torque does not exceed the maximum allowable. Note that max. torque = RATE x max. speed of rotation.
- For a vane dashpot the RATE does not vary much with speed and so can be used to specify the unit.

Continuous Rotation Dashpots - (Lower rate, unlimited travel)



- Establish the rate from the formula for one of the cases opposite (or otherwise).
- Calculate the working speed w in radians/sec.
- Calculate the working torque (RATE x working speed of rotation).
- The rate of a CR dashpot is not constant. It varies with speed. This is because at the high shear rates used by this method of damping the viscosity of the fluid is not constant (Non-Newtonian). The performance of a CR dashpot is thus not specified by a single rate but is specified by a graph showing torque against speed of rotation.
- To select a CR dashpot plot the required working torque against the speed on the graph given on the data sheet. The nearest curve above the point gives the selected dashpot.

Temperature Effects

Damping rate is reduced by increases in fluid temperature (and increased by reduction in temperature). The graph opposite indicates the percentage change in damping rate with temperature, relative to the rate quoted at 20°C.

Dashpots compensated for temperature change, to keep damping rate constant, can be supplied to special order.

In addition to the effect of ambient temperature, heating of the dashpot above ambient is caused by the power absorbed by the damping action. Power dissipation limits are given for 20°C ambient. At temperatures above 20°C these power limits are derated by a factor:

$$(T_L - T_A) / (T_L - 20)$$

where T_L = Limit Temperature and T_A = Ambient Temperature.

Provision is made for temperature expansion of the fluid and no topping up is required during the life of the dashpot.