11 Vibration-damping elements - Guidelines for the choosing

Basic data required

- Disturbing frequency: the frequency of the disturbing vibration produced by an on-duty machine. In general, it is obtained by the number of rotations of the engine [Hz=r.p.m./60];
- The load applied to every single vibration-damping element [N];
- The isolation degree required [%];
- The deflection value of the vibration-damping element under a given load [mm];
- The stiffness [N/mm], that is to say the load that applied to the vibration-damping element produces a deflection of 1.0 mm.

How to choose the vibration-damping element

- With reference to the diagram for checking the isolation degree, intersect the disturbing frequency value with the isolation degree required (each isolation degree corresponds to a line in the diagram) and define the deflection [in mm];
- Divide the load applied onto the vibration-damping element by the deflection value to obtain the required stiffness of the vibration-damping element;
- Compare the stiffness obtained with the stiffness shown in the table and choose the vibration-damping element which presents the nearest value (lower) to the calculated one (the stiffness values reported in the table refer to the maximum load values);
- The designer must verify that the article chosen through this selection criterion is suitable for the application required, in any case. For this purpose on request for each article, non-linear graphs of the spread (according to the applied load) are available.

Example

Conditions of use:
- Disturbing frequency= 50 Hz (3,000 r.p.m.);
- Load applied on each vibration-damping element 120 N;
- 90% isolation required;
- Diagram shows that with a 50 Hz disturbing frequency and an isolation degree of 90%, the deflection obtained is 1.0 mm;
- Divide the load applied by the deflection obtained to define the rigidity required, which is 120/1.0 = 120 N/mm;
- Compare the rigidity value obtained (120 N/mm) with the values reported in the table;
- The values reported in table, for type DVA.1, show that the vibration-damping element which should be used is DVA.1-25-20-M6-18-55.

Diagram for checking the isolation degree of the vibration-damping element