

Aseismic Bearing with Partially or Totally Curved Sliding Surface and with Angular Corrector

The aseismic system that uses the proposed bearing has the following characteristics:

- interruption of the solidarity between the building and the ground-foundation complex and the positioning of bearings with the double function of being fixed bearings in the absence of an earthquake and of being movable multidirectional bearings, with sliding or rolling friction, during an earthquake;
- the sliding surface of each bearing is formed by two parts: the central part, circular, is flat and horizontal. During an earthquake, its function is to keep the building in a perfectly vertical position, almost motionless and non-deformed with respect to the horizontal traverse of the ground-foundation complex. The perimetric part, on the other hand, has a curved vertical section and its function is to allow a spontaneous and partial centering of the building if the horizontal displacement of the bearing exceeds that laid down in the design. If the bearing has a completely circular section sliding surface, on the other hand, at the end of the earthquake the building is subject to a spontaneous and complete centering, while during the earthquake it is subject to a variable vertical movement in function with the curvature of the sliding surface;
- unlocking and locking of the building, respectively at the beginning and end of the earthquake, effected by electronically controlled electromechanical devices;
- presence in each bearing of an angular corrector able to compensate for any eventual rotation of the building on its own axis and to allow locking at the end of the earthquake;
- a moderate level of seismic energy in the building, equal to approximately 1% of the weight of the building, using sliding friction bearings; this is negligible, on the other hand, if rolling friction bearings are used;
- total or partial psycho-physical unease for the inhabitants, according to whether the sliding surface is partially or totally curved;
- economic competitiveness with conventional systems and with similar base isolation systems. The higher cost for the bearings is amply compensated by the lower cost of the building structures;
- system completely independent from the seismic frequency, with the possibility of applying it to structures with very low resonance thresholds.