# SUPERIOR SEISMIC PERFORMANCE

The Knauf Exterior Wall with AQUAPANEL® Technology is ideal for earthquake zones because of its low dead weight. Lightweight structures have a lower risk of failure and less potential for damage in the case of failure. In the event of an earthquake, redevelopment and repair can easily be carried out.

Because steel supporting structures display ductile load-bearing behaviour, they are the first alternative for the loads occurring during an earthquake. In the case of dynamic loads, the energy that is present is dissipated. In addition, there is reduced intrinsic stress perpendicular to the plane of the component and a lower risk of damage/injury.

	Masonry infill	Drylining infill
Dead weight (kN)	8107	6160
Behaviour factor q	2.0	4.0
Earthquake load on base point (kN)	2919	1109

The Knauf Exterior Wall with AQUAPANEL® Technology is stable both "in- plane" and "out-of-plane". The contribution of the screw connection to the ductility of the lightweight construction system can be seen here.
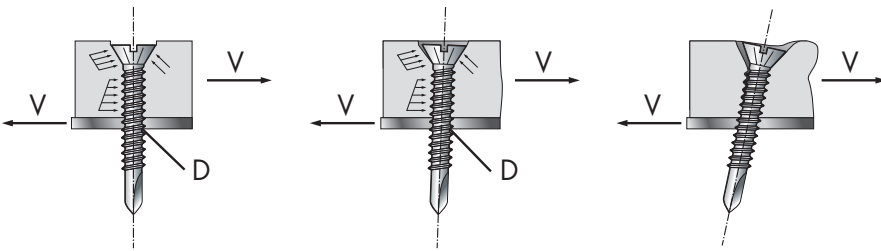
Result: Trials have shown that, due to the positive deformation behaviour and the ductility of the lightweight construction, the force on the conventional wall is 3 times higher in comparison. This is due to the higher weight and stiffness of brick and block wall.
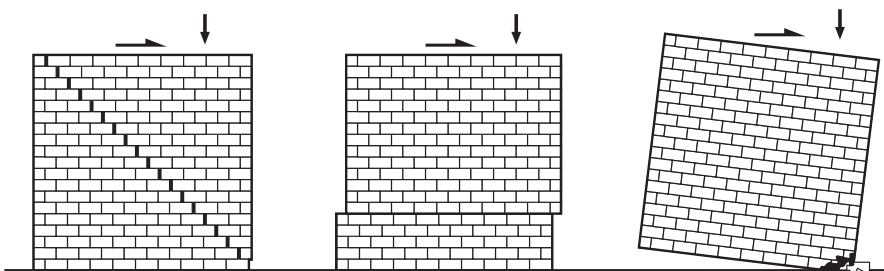
Case study:
Seismic trial – Athens, Greece

A complete two-storey lightweight house was created on a steel structure using a Knauf Exterior Wall.

The house was subjected to rigorous tests:
› Low amplitude sine-sweeps in X-, Y- and Z- directions
› Bi-axial earthquake loading: 100% in horizontal and 70% in vertical direction
› Tri-axial earthquake loading: 100% in both horizontal and 70% in vertical direction
› Peak ground acceleration trial with force of 1 g

With no damage to the structure or façade at even 1 g acceleration, the Knauf Exterior Wall with AQUAPANEL® Technology was proven as the alternative to masonry in seismic zones due to its light weight, its high ductility, and its high resistance to out of plane motion.