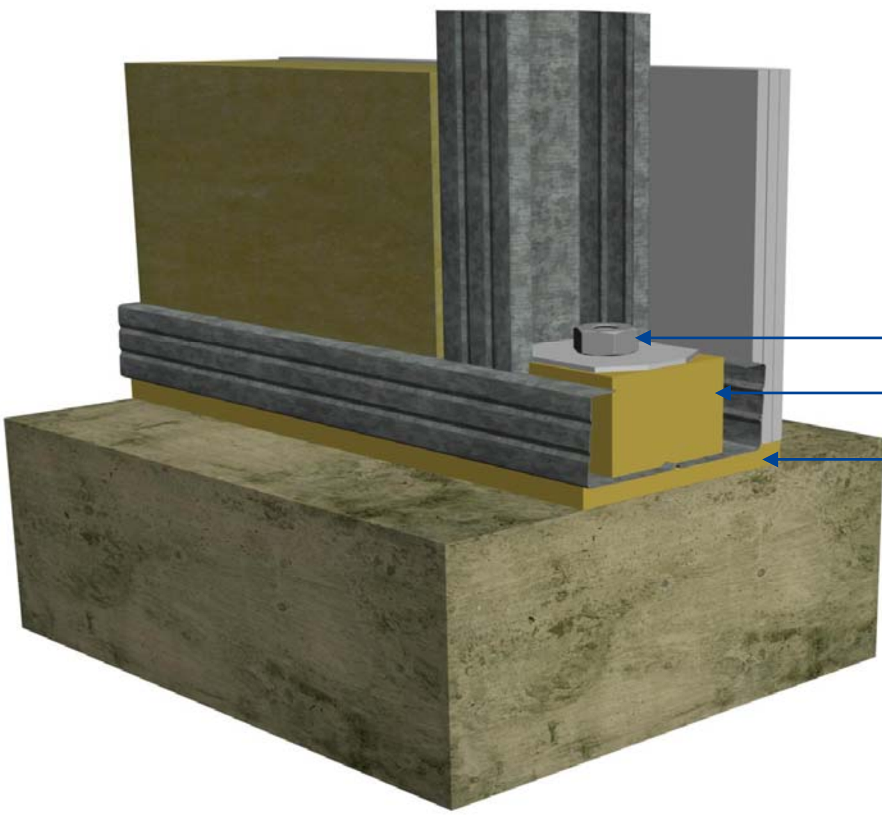
CDM-ISO-STRIP & FIX-WALL

SYSTEM DATASHEET

Base Decoupling For Drywalls
Wall Base Sound Isolation Strip

CDM-ISO-STRIP-WALL Base Sound Isolation Strip is designed to acoustically decouple plasterboard studwalls from the supporting floor structure, hence minimizing flanking transmission of noise. It can be used to create Box-in-Box setups where the walls are not supported off the floating floor.

If necessary, the strip can be supplied with one or two self-adhesive sides. Resilient fixations by means of elastic stabilizers as shown below can be used in case the drywall must be fixed to the supporting floor for stability reasons, but is no necessity.



Required Data for Design:

- required performance, e.g. insertion loss or natural frequency
- imposed permanent and temporary working loads
- contact surface (type and dimensions)

CDM-ISO-STRIP

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noise & vibration control

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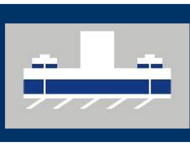

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CDM-ISO-FIX

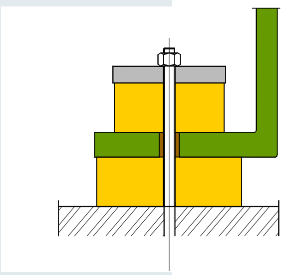
TECHNICAL DATASHEET

Isolated Fixation
Setup of a resilient connection

FIELD OF APPLICATION

CDM-ISO-FIX is a general fixation principle that guarantees a full acoustical decoupling of a (suspended) structure with respect to another (supporting) structure, to which it must be connected, mainly for reasons of stability. If well designed, it ensures an efficient reduction in the transmission of noise & vibration energy. Typical applications are: all kinds of machinery and equipment, guide rail isolation for elevator shafts, automated garage doors, pipe fixations, but also entire building structures (e.g. in steel), etc.

DESCRIPTION



Basically, any of the **CDM-SOLIDS** materials can be used for this application, and one can even play with different pad types and sizes.

There's always 3 essential components to be designed:

1. The isolator (lower yellow element)
2. The stabilizer(s) → 1 per fixation bolt (upper yellow element)
3. The flexible washer(s) → 1 per fixation bolt (inside the green structure at the bolt shaft)

The isolator element is always situated in between the two structures which are to be decoupled. The stabilizer(s) is (are) located under the head of the fixation bolt(s), and the flexible washer(s) is (are) situated inside, to ensure decoupling between the fixation bolt shaft and the surrounding structure. To be able to introduce such a washer, the hole must usually be made larger, e.g. by drilling. This washer is of essential importance in case there's possible transmission of structure-borne noise through the considered connection (especially at frequencies superior to 100Hz).

Each stabilizer normally needs to be covered by a load distribution plate (e.g. galvasteel or stainless steel), to avoid unacceptable local deformation when tightening up the fixation bolt. This plate should fit exactly to the surface of the stabilizer. One can use the following formula relating the required turning momentum (M), in case a "momentum key" is used, to the precompression force (F) on the stabilizer: $M = F * d / 5$ (with d = the nominal bolt diameter). From a static point of view (when putting the precompression), the isolator and stabilizer act as a "serial spring combination", so the precompression force over all the stabilizers is equal to the precompression force over the isolator.

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RECOMMENDATIONS

• The **(initial) precompression force** typically corresponds to a deflection of the stabilizer equal to 20% of the unloaded thickness.

• The equivalent static stiffness of the stabilizer(s) Kss ("parallel combination of springs" here, so Kss is equal to the sum of the individual static stiffnesses of all the stabilizers involved) should be **corresponding** "more or less" to the (equivalent) static stiffness of the isolator Ksi. However, as the available surface of the stabilizers is usually smaller than the available surface for the isolator element, the grade of the stabilizers should be equal (or higher) than the grade of the isolator.

• The **time of installation** is often important for the design of the components: in case the precompression is only applied at the start, before any gravitational load is supported by the isolator, then there will be a deflection of the isolator taking place during the installation of the mass (e.g. during a construction process of a building), thereby de-stressing the stabilizers. The design should be such that the stabilizers don't come loose and that the fixation remains stable at any moment later on. In case it is possible to put the precompression after the full graviational load has been applied on the isolator, the grade of the stabilizer(s) can be taken equal or even lower than the grade of the isolator. In some cases it might even be best to tighten up the bolts once at the start and once at the end of the works. To do so, it is essential that all components remain well accessible at all times.

• From the viewpoint of transmission of noise & vibration energy, an **ISO-FIX** setup acts as a **"parallel combination of springs"**: the energy will partly be transmitted via the isolator and partly via the stabilizer(s). So here the equivalent dynamic stiffness of the global fixation Kd equals the sum of the dynamic stiffness of the isolator Kdi and the dynamic stiffness of the stabilizer(s) Kds. As a result, the presence of the stabilizers increases the resonance frequency (when compared to the resonance frequency of the isolator alone). Roughly one can estmate this increase with a factor = $\sqrt{2}$ in case the unloaded thickness of isolator and stabilizer(s) are (almost) identical.

• The **ISO-FIX** setup can also be used to fix **vertically**: against a wall, like for elevator guide rails, or the guide rails of automated garage doors. In that case it is recommended to (elastically) support the structure which is to be fixed also from underneath, to avoid that the isolated fixation needs to take up all shear forces. Otherwise the flexible washer element(s) inside would be squeezed excessively due to the small dimensions and concentrated loads.

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