Accelerometer Mounting

Choosing the optimum mounting arrangement will significantly improve the accuracy.

For best performance, particularly at high frequencies, the accelerometer base and the test object should have clean, flat, smooth, unscratched and burr-free surfaces.

A scratched accelerometer base can be applied to a lapping plate for restoration of flatness. If lapping is not possible, other machining processes such as grinding, spot facing, milling, turning, etc., can produce acceptably flat mounting surfaces.

It is also important to provide a stiff mechanical connection between the sensor and the source of vibration. Sheet metal or plastic parts and other thin and flexible components are unsuited for accelerometer mounting.

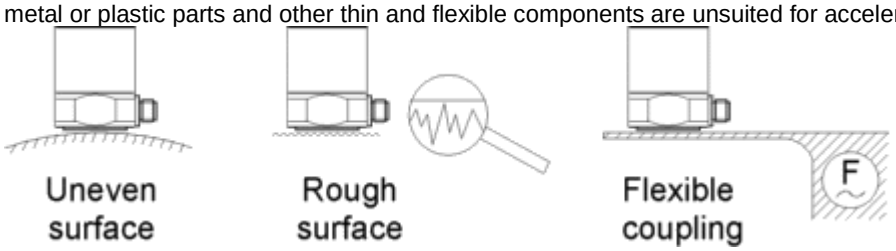


Figure 15: Typical reasons of coupling errors
Errors due to unwanted sensor vibrations can be reduced by symmetric mounting. The weight of the sensor including all mounting components should be low compared to the weight of the test object. As a rule the sensor should not weigh more than 10 % of the test object.
Misalignment of the sensor axis and the measuring directions should be kept as low as possible, particularly if transverse vibration of high magnitude occurs. When using screw mounting, make sure that the screw is not longer than the threaded hole. The must be no gap under the sensor.

The following mounting methods are recommended for accelerometers:

- Stud mounting with stud bolt, insulating flange or adhesive pad
- Magnetic base
- Adhesive by bee wax, cyanoacrylate (e.g. the gel-like Loctite 454) or epoxy glue
- Mounting cube for triaxial measurement with three uniaxial accelerometers
- Accelerometer probe by hand pressure
- Accelerometer with movable probe tip

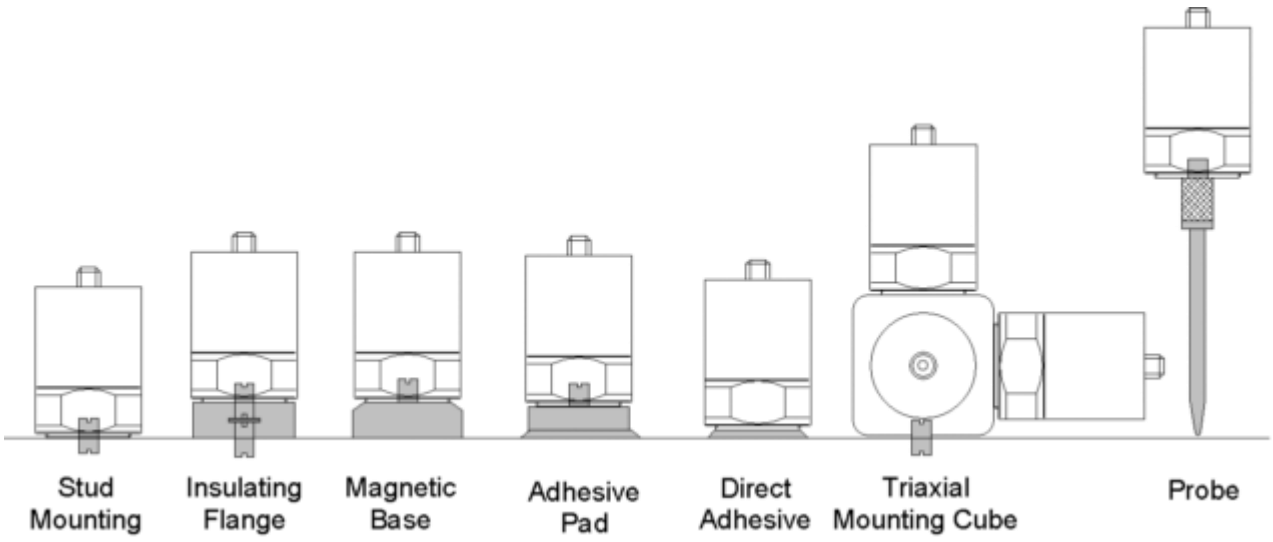
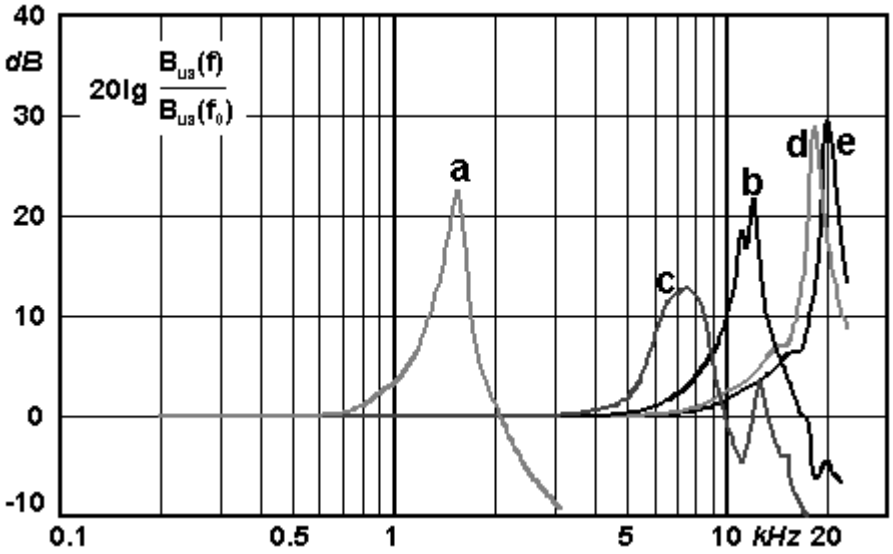


Figure 16: Mounting methods for accelerometers

Figure 17 compares the typical high frequency performance of some mounting methods as a result of added mass and reduced mounting stiffness.



a: probe model 001; b: insulating flange; c: magnetic clamp; d: adhesive; e: stud bolt

Figure 17: Resonance frequencies of different mounting methods

Metra accelerometers may have the mounting thread sizes: M3, M5, M8 and M10.

Many transducers are available with an accessory kit (ordering option "/01") containing all suitable mounting parts.