

## **Operational Guidelines**

The following are qualitative descriptions of housekeeping standards. The intent is to help the operation visualize the day to day standards that need to be met. These were originally applied to handling respiratory allergens and are probably also applicable to nano material handling.

1. No visible dust and no nano sized aerosols detected by instruments capable of detecting point sources (e.g. P Trak). <sup>(1)</sup>
2. No visible dust on surfaces. <sup>(2)</sup>
3. No recurring spills of nano raw material or product containing nano raw material.
4. Spills are cleaned immediately with central vacuum systems or portable vacuum cleaners equipped with HEPA filters.
5. No temporary repairs of equipment. <sup>(3)</sup>
6. Treat empty containers as full. <sup>(4)</sup>

### **Notes:**

- (1) If the nano material is added to a larger powder then containment should be such that no visible dust is observed by the eye or by back lighting. If only nano material is present dust may not be visible but should be detectable via instruments such as the P Trak.
- (2) One interpretation of no visible dust on surfaces is the white glove test. If you put on a white glove and ran your finger across a surface your glove should remain dust free.
- (3) In some operations when something goes wrong a temporary fix is made to keep the system running for a time. For example putting flexible ducting in place until the machine shop fabric a new elbow to replace the original metal elbow that failed in use. Very often these temporary repairs can be left in place for a considerable time – effectively they become permanent. This should not be allowed to happen when handling nano materials.
- (4) Even when a raw material container is emptied it could contain residual material. Removal/discarding of the empty container is a potential source of exposure. Risk can be minimized by connecting the container to a central or portable vacuum cleaner to remove residual material. If the container is a bag it can be folded on itself when still connected to the vacuum. Thus material and air is removed from the bag which is folded into a minimum size and can be placed in a plastic bag or sealable drum for disposal.