

Material Identification: The First Step in the Process Safety System

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▲ Most containers of the same type look similar, such as drums, intermediate bulk containers (IBCs), flexible intermediate bulk containers (FIBCs), and railcars (Images 1–4, respectively). This makes proper labeling critical.

Chemical containers often look very similar, requiring operators and engineers to be vigilant during their shifts. For example, an operator was adding a raw material to a process unit from several drums. The drums were black with white ends and had blue and white labels. After adding the contents of approximately 20 drums, the operator noticed a drum that looked identical to the others but had a different name on it. The drum contained a different material than was specified for addition. The operator called an engineer who advised not to add the drum and to isolate it until proper handling could be determined.

A serious incident could have occurred if the operator had added that material. At a minimum, it would have caused a major quality problem that would have reduced profit and perhaps prevented the company from fulfilling an order.

Safeguards are in place to prevent situations like this. However, the supplier made an error when loading drums onto the pallets. The person receiving the material at the company warehouse also made an error by not noticing that at least one drum received in that shipment was different. These safeguard systems rely on personnel following their procedures and paying attention to details.

Similar to this example, many chemical handling operations rely heavily on personnel performing their jobs correctly. Many process safety systems in the chemical process industries (CPI) rely on materials being properly labeled. Electronic scanning of incoming materials can help verify that chemical shipments are correct, but only if drums and other containers are properly labeled by the supplier.

Did You Know?

- Chemical receiving systems rely on administrative controls. Personnel must follow procedures and be attentive to details at all times. A brief lapse in attention can cause a serious event.
- Humans make mistakes, despite fully focusing their attention on a task. Even highly trained personnel such as pilots and astronauts perform their tasks correctly only 99% of the time.
- Some companies use the four-eyes approach, in which another person observes the setup or operation to verify that the procedure is followed correctly.
- Several incidents have occurred because a bulk material was pumped into the wrong tank. This can cause serious consequences, such as overfilling and spills, reactions, fatal toxic releases, contamination of the tank, and financial loss.
- Many bulk loading or off-loading events have been caused by using incorrect equipment, such as the wrong type of hose or the wrong fork truck to move semi-bulk containers.

What Can You Do?

- Follow procedures for handling bulk materials or containers of materials. If a procedure has errors, make note of them and communicate them to your supervisor for editing.
- Use only approved equipment for chemical transfer.
- Pay extra attention to labels — those from the vendor and those that are applied for internal use. Even very small containers (*e.g.*, laboratory samples) must be properly labeled.
- Bulk shipments have different types of labeling.

When receiving bulk shipments, verify the contents before off-loading. Some companies sample the shipment for lab analysis to verify the contents rather than accepting shipping paperwork. When shipping bulk containers, verify that the documentation is complete and correct.

Properly receiving chemicals is a critical step that protects all downstream processes.

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