White paper

Labeling in a Clean Room Media Supplies

Intermec by Honeywell

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What is a Clean Room?
Clean rooms are no longer confined to the healthcare industry. Products, processes and a variety of industries such as aerospace, telecommunications, semiconductors, chemicals, computers, integrated circuits, food and pharmaceuticals can benefit from the control of airborne contaminates. Even auto manufacturers are painting in clean rooms to obtain a higher quality, longer lasting paint finish.

Clean rooms must be clean of nearly all particulate. Particulate can be airborne such as pollen, bacteria, or windblown dust. Combustion processes, chemical vapors, cleaning agents, soldering fumes and friction caused by manufacturing equipment also introduce particles. People produce particles in the form of skin flakes, lint, cosmetics and respiratory emissions.

Classification of Clean Rooms
Federal Standard 209 has been widely used for over 20 years; ISO/TC209 has now taken its place. Regardless of the standard, the concept is unchanged: clean rooms are measured primarily by the quantity of airborne particulate per unit of air volume. Because people and processes inherently introduce contamination, the air in a clean room is constantly replaced with freshly filtered air to reduce particulate concentration. However, this airflow only reduces particles that are already in the clean room. As such, it is essential to minimize particle generation by choosing products and processes suited to this type of controlled environment.

Labeling in a Clean Room
Bar coding has brought many benefits to industry, including increased product tracking ability for quality purposes, improved data accuracy due to eliminated data entry errors, enhanced process awareness, and real time product visibility. Electronics, pharmaceuticals and other industries operating in clean rooms can realize the same benefits by implementing bar code and auto ID technologies. However, labels used in clean rooms can cause contamination if they are not designed for this environment. Dust particles can be released from the label facesheet, the liner or from the core upon which the labels are wound; flaking of thermal transfer ribbons can also create contaminating particulate. In addition, out-gassing from the adhesive can release contaminating chemicals into the air, potentially leading to problems with airborne molecular contamination. In situations where the label must be removable, adhesive residue can further contaminate the product by allowing particulate to stick to the residue, leading to contamination further along in the process.

Label Requirements in the Pharmaceutical and Electronics Industries
Pharmaceutical companies are concerned with the spread of bacteria and viruses. For this reason, some companies test the propensity of labels to breed bacteria by culturing them in laboratory Petrie dishes. Intermec's clean room labeling solutions tested in this manner by pharmaceutical companies did not breed bacteria and, therefore, passed the test. Dirt and dust particles also provide an environment for bacteria to grow, and must also be controlled; bar code labels used to identify and track pharmaceutical products must not increase the risk of generating particulate. To further reduce the risk of microbial contamination, some pharmaceutical products are sterilized to kill any organisms that may be present. Sterilization may require subjecting the product to high temperatures; gamma radiation and gas are two additional methods of sterilization. In the gamma radiation process, gamma rays pass through a package of products such

as sterile bandages or pills, killing any living organism. In the gas sterilization process, poisonous gas is released into a room containing the product. The gas penetrates the product packaging and kills any bacteria or germs that are present. Labels are often required to withstand any or all of these sterilization processes.

In the electronics industry, particulate itself can cause damage. The smallest dust particle can damage a silicone wafer or semi-conductor during processing. In wafer manufacturing, bar code labels are used to track products through the manufacturing process. A removable label is applied to a tote or container that is employed to protect the wafer from airborne particles as it moves through the manufacturing process. Any adhesive residue remaining once the label is removed will attract dust and potentially corrupt the products.

Intermec's Clean Room Solution
Intermec offers five clean room labeling solutions, each designed to keep clean room environments free from potentially damaging particles and contaminates. The following features reduce the risk of contamination:

- Synthetic facesheet
- Labelsandtagsfurnishedonnon-dust-generatingsynthetic liners
- Labels and ribbons wound on plastic cores instead of corrugated cores to eliminate paper dust generation
- "Glove-friendly" adhesives that do not stick to laboratory gloves
- TMX3200 ribbons that are abrasion-and flake-resistant

Intermec's Clean Room Products
Clean Room Permanent High Tack Label
Aggressive adhesive that is engineered to adhere to low surface energy substrates.

Clean Room Ultra Removable Label
An adhesive with excellent removability from most substrates.

Clean Room Standard Removable Label
Adheres to totes and carriers as they move through the clean room, but leaves little to no residue when removed.

Clean Room Tag
Developed for clean room applications where there is zero tolerance for out-gassing from adhesive residue.

Clean Room Ribbon
Designed to reduce the risk of contamination, this ribbon is wound on a plastic core and is resistant to flaking and smearing.

Intermec's Success
Intermec clean room solutions have been placed in all classes of clean rooms. Our customer list includes leading electronic and pharmaceutical companies.

For more information on clean room applications, call the Applications Analysts at the Media Supplies Division of Intermec Technologies Corporation (513-874-5882).

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