

RMS CLEAN ROOM

By Rob King, Senior Design Engineer

When rotating equipment is overhauled, cleaning of all the parts is a typical step in the process to facilitate inspection and preparation for reassembly, so that the equipment is returned free from oil, grease, and debris. However, due to safety concerns associated with unique processes, some machinery applications require a much more rigorous level of cleanliness, necessitating the use of a “clean room.”



Figure 1

A clean room is a purpose-built dedicated clean working area, isolated from the typical machine shop/assembly floor environment. Access doors for the clean room have seals to minimize air exchange with shop, and are kept closed as much as possible. An overhead crane located within the room is a necessity for performing maintenance on larger sized equipment. A dedicated air-handling unit for temperature and humidity control, with separate outside air exchanges is also needed

to keep the environment within the clean room free from typical oil/hydrocarbon vapors that tend to be present in shop environments. In order to minimize rusting of clean carbon steel components, humidity must be controlled as well. Humidity control is also important when servicing machinery that utilizes seal inserts made from materials such as Fluorocin, as these materials will absorb moisture and swell in high humidity conditions, causing dimensional changes to the parts.

Two examples of machinery applications that require the use of clean rooms are for equipment in oxygen service, and chlorine service. Chlorine compressors have been part of the RMS AC-Compressor fleet for over 50 years. Chlorine gas can react with hydrocarbon oils and greases, and in certain conditions, can be explosive. Additionally, chlorine gas will support combustion if ignition is triggered, potentially causing dangerous equipment fires. During chlorine compressor overhauls, extra precautions are applied throughout manufacturing process to reduce/eliminate contact with hydrocarbons, and the use of a clean room for compressor assembly is the final step for ensuring the necessary level of cleanliness. The clean room provides the right conditions for final part cleaning and verification using black light inspections for any trace hydrocarbons. If trace amounts of oils or greases are found, parts can be cleaned within the room using appropriate cleaners. Once parts are validated clean, the room environment eliminates risk of further contamination as the remainder of assembly is completed. When final compressor assembly is complete, a nitrogen gas purge is typically applied to equipment to ensure the clean gas environment is maintained within during storage.

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