inMotion
The VLT® Newsletter
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Clean performance for clean blood

ASEM-NPBI is the world leader in products for blood collection and processing. The company is building a new factory in Brazil and the installation of Danfoss VLT® variable frequency converters in the HVAC system is helping to ensure that the factory's Clean Room meets the strict contamination control standards.

For 35 years Henk Scheepstra, Industrial Director for ASEM-NPBI Hospital Products Ltda., has been working in the field of bags for blood collection. Today his biggest challenge is completing the new ASEM-NPBI factory in Itapecerica de Serra, a city in greater São Paulo, Brazil.

There will be more than 1200 square meters of Clean Room space in the new factory, which must meet contamination-free criteria under strict guidelines. The designers of this space, ARDUTEC, were chosen based on their expertise in clean rooms and their experience in developing the clean room for ASEM-NPBI's existing factory, which will close when the new one is opened. Mr. Henk emphasizes, "The clarity of the proposal, the engineering solutions offered, consistent service, and the support of the technical team, led by engineers Heloísa Meirelles Costa and Luiz Augusto Laurino were the deciding factors for choosing ARDUTEC for the project."

ASEM-NPBI is today the leader in the field of making medical products for blood collection and processing. Through several acquisitions over the years, the company has grown the size and scope of its operations, expanded its product line, and worked to produce high quality, lower cost products produced with high efficiency. ASEM-NPBI is ISO 9000 and TUV certified and was the first Brazilian company to earn the CE mark.

ASEM initiated its activities in 1990, with 98 percent Brazilian investment and two percent investment from the Dutch company NPBI. Its first project was to produce bags for collecting blood and filters for removal of leukocytes (white blood cells), utilizing NPBI technology. In 1994 NPBI acquired all the activities of ASEM, which became ASEM-NPBI.

Over the years followed the acquisition of NPBI by FRESENIUS Group and the acquisition of Hemoblu Indústria of Produtos

ASEM-NPBI is the leader in products for blood collection and processing.

Médicos Hospitalares Ltd. Today ASEM-NPBI is a division of FRESENIUS KABI AG, the leader in systems for blood collection, transport, processing and identification.

Millions of bags of blood

ASEM-NPBI's principle clients are public blood centers. By law, each state in Brazil must have its own blood center. These blood centers are responsible for collecting almost 70 percent of donated blood, while 30 percent is collected through private blood banks, and must be authorized by the government.

The biggest blood center in Latin America is the Fundação Pró-Sangue (the Pro-Blood Foundation), next to the Hospital das Clínicas in Sao Paulo. "We estimate that in Brazil about 3.5 million bags of 450 ml and less are collected each year. The discarded blood is about 15 percent (525,000 bags of blood), due to various modern bloodborne sicknesses," says Mr. Henk.

He explains that the blood bags are universal in design and function, varying only in size. The material is PVC plastic, which is very flexible, made with a bag mold and then put together with special machines. The bags are made in a carefully controlled environment and the machine operators, equipment, furniture, and uniforms must be kept extremely clean.

"The blood bags are used for transfusions and hold various blood products, such as plasma, red blood cells and platelets (which assist in blood clotting). There are six different blood products stored in the bags that ASEM produces," Mr. Scheepstra explains.

Conforming with the vigorous norms of NBR ISO 14,644.1, the clean rooms of ASEM are class 7 (formerly class 10,000), in which the environment cannot contain more than 352,000 suspended particles larger or equal to .5 micrometers per cubic meter. In this case there is no differentiation made between living and non-living particles (microorganisms, bacteria, yeast and other pathological agents).

All the personnel that enter the room must pass through an antechamber to put on the proper clothes and booties.

The clean room will always maintain a positive pressure, with a precise antechamber differential. Mr. Scheepstra has used Danfoss pressostats for years to control pressure differentials. "They are very precise and reliable," he says. The clean room air must be renewed a minimum of 20 times per hour, which is carried out through TROX fan coils.

The new ASEM factory will have more than 1200 square meters of clean room and various antechambers for coming and going of the personnel, raw material, uniforms and finished products. In addition, there is a special clean room to control the environment where the uniforms are washed and all contaminants are removed, daily. Up to 100 people at a time work in the clean rooms throughout the day. The Danfoss VLT HVAC 6000 variable frequency converters will be installed to help maintain the desired air quality. In total, 7 Danfoss variable frequency converters will be used in the new area.

Danfoss Drives keep it clean

The KSB pumps will be controlled by VLT HVAC 6000 variable frequency drives. They will be applied to control the water flow for the pumps in the water chillers according to the heating load to maintain the minimum pressure necessary for the water chillers made by TRANE.

VLT® frequency converters in the TROX fan coils

The VLT variable frequency drives have the important task of controlling the motor speed of the fans in the HVAC system

to ensure the proper pressure in the clean rooms 24-hours per day. "We expect that the Danfoss drives performance will achieve this," says Mr. Shceepstra. "The pressure is constantly changing due to opening and shutting of the doors of the clean room and antechambers, with 100 people working in the rooms, and so much equipment, raw material and finished products that come and go throughout the day.

We take care to disinfect all the material such as computers, machinery, maintenance tools, furniture, raw material, and so on, but the air exchange in the clean room is the most delicate component."

Contamination control

Another detail in the clean room is the humidity, which must be between 30 and 70 percent of the norm. ASEM maintains a stable 50 percent, of the norm principally to avoid damage to machinery and also the growth of microorganisms. To do this it is am important role of the VLT variable frequency converter to maintain constant flow so that the humidity remains in the desired parameters. Mr. Scheepstra also explains that the drives help to counteract natural problems in the system.

"Besides the fans there are air filters that over time accumulate particles and make it difficult for the air to circulate in the clean room.

At this time, the variable frequency converters go into action to counter the resistance cause by the pressure lost in the filters increasing the fan velocity to maintain the air flow necessary."

The contamination is evaluated by laser equipment, which count precisely the quantity of particles in the air and also equipment that collects the organisms (fungus, bacteria, yeast, etc.), later counted in the ASEM laboratory. The new ASEM factory will be ready in March of 2006 and we will be there to document the units as they go into service.

ASEM-NPBI's new factory includes more than 1200 square meters of Clean Room space.

ASEM-NPBI is a division of FRESENIUS Kabi AG, the leader in systems for processing blood and blood products, measurement systems, bags for blood collection and transfer, filters for removing leukocytes and agents for blood type identification.

Worldwide, the three divisions of the FRESENIUS Group, Fresenius Kabi, FRESENIUS Medical Care and FRESENIUS ProServe have 68,494 employees and earnings of 8.5 million dollars.

In Brazil, the FRESENIUS group is represented by FRESENIUS KABI, which makes medical products and has factories in Campinas, Sao Paulo and Aquiráz and employs in total 931 people, with earnings of 130 million dollars, in addition to ASEM-NPBI, which makes products and equipment for blood banks in its Itapecerica de Serra and Bluemenau, Santa Catarina factories, which has 420 employees and earnings of 72.73 million dollars and the FRESENIUS Medical Care, which makes machines and disposable needles for hemodyalisis in its factories in Jaguariúna, with 364 employees and earnings of 182 million dollars.