

Daikin boosts efficiency

Reefer container machinery manufacturer Daikin Industries is planning to make a number of hardware and software upgrades to its established LXE-10E scroll/R134a machine to provide a further boost in energy efficiency.

According to David Marjoram, general manager of the refrigeration business unit at Daikin's global sales agent, Itochu Europe, the enhancements include an improved condenser fan motor and evaporator fan deck design, and a new version of the Daikin Temperature Management System (DTMS) software, which will once again reduce the LXE-10E's power consumption.

The latest LXE-10E design will be on display at the Intermodal 2010 exhibition in Amsterdam on November 30-December 2 alongside a concept model of a completely new machine Daikin is working on,



New technology will further boost the energy efficiency of the LXE-10E unit

which incorporates these and other new technologies.

Though full details have not been released, Marjoram said the concept model will be the first scroll-platform unit in the reefer container industry to incorporate

inverter technology to allow infinitely variable capacity control by adjusting the compressor's power supply frequency.

It will also feature a reluctance DC compressor motor, which is claimed to be around 20% more

energy efficient than conventional AC or DC electric motors.

"The technologies being developed in the concept unit will provide power consumption reductions in the order of 35% without any further software enhancements," Marjoram said.

Daikin will also use the Intermodal 2010 exhibition to unveil details of other new products under development, including an air purification system and a low cost controlled atmosphere (CA) system based on the use of a nitrogen or carbon dioxide-selective membrane, which will allow the oxygen level inside the container to be regulated without the need to introduce external gases.

Daikin has over 180,000 reefer units in operation with over 130 customers, the vast majority being the LXE-10E unit, which was launched in 2001. Ongoing hardware and software enhancements since that time have seen the latter's energy consumption reduce by close to 50%.

Towards waterborne container coatings

In an effort to introduce more eco-friendly processes to the container manufacturing industry, China International Marine Containers (CIMC) has announced that its Dalian plant will become the first container factory in China to abandon the use of traditional solvent-borne coatings.

According to CIMC, the use of solvent-borne paint was suspended at the end of September following a decision to modify the Dalian coatings line to facilitate waterborne paint application.

The move follows the modification of one of the paint lines at CIMC's Taicang factory with the cooperation of US coatings manufacturer Valspar earlier this year. As reported in the February 2010 issue of *WorldCargo News*, the modified line has successfully applied Valspar's Aquaguard waterborne coating to a run of 100 x 40ft high cube containers built for lessor Triton Container International.

Container coatings are one of the major issues of concern for the container manufacturing industry as the emission of Volatile Organic Compounds (VOCs) from solvent-borne paint damages natural resources and can have harmful effects on human health. CIMC says waterborne paint can help reduce the emission of VOCs by over 70%, which equates to a reduction of 200,000t of CO₂ emissions per year based on an annual output of 2M TEU.

As early as the 1990s, a wave of waterborne paint application

was undertaken by container manufacturers in the US, Europe and the Far East but none was successful.

CIMC itself started research on waterborne paint and its application in 2003 and between 2004 and 2009 committed substantial investment in both manpower and materials to carry out over 100 trial applications using coating systems from new manufacturers such as VABC and Valspar.

Waterborne coatings are now gaining rapid acceptance as an alternative to solvent-borne paint in a wide range of industrial applications and offer a more environmentally-friendly option, which can better satisfy legislative requirements, as well as reduce health and fire risks, CIMC says.

In what it describes as a strategic approach, CIMC says that following the upgrade of the Dalian factory, it will modify the coatings lines at its other plants in a systematic way in order to allow waterborne coatings to be applied.

The move towards waterborne coatings is the latest in a series of environmental initiatives undertaken by the world's biggest container manufacturer and follows the replacement of tropical hardwood plywood flooring with bamboo, larch/birch and eucalyptus plywood alternatives.

CIMC has also pioneered the use of high tensile steel in standard box production, which reduces the tare weight of a 40ft high cube by around 550 kg.

New protective coating for door gear

Saejin Container Components Co, which operates three container door hardware manufacturing plants in China, has developed a new aluminium ceramic coating system as a more environmentally-friendly alternative to hot dip galvanizing for the protection of locking gear and hinges.

Widely used in the aviation and space industries, the new coating is claimed to produce a higher quality finish than zinc galvanizing, whilst at the same time improving corrosion resistance and eliminating the toxic emissions released by the hot dip galvanizing process.

According to Saejin, China's rapid economic growth in recent years has led to increasing pollution problems. The State Council has now mandated that domestic projects and foreign-funded ventures in all major cities will be scrutinised in future to determine whether their production processes will generate hazardous gases or waste water, which pollute the environment.

In the container business, the zinc galvanizing of locking devices is an extremely polluting process as zinc is a highly volatile, toxic metal. Each phase of the hot dip galvanizing process – degreasing, rinsing, acid pickling,

galvanizing, cooling and chromating – generates highly toxic pollutants. Chromating, in particular, produces potassium dichromate and sulphuric acid, which cause severe pollution of the atmosphere as well as great harm to human health.

Under the supervision of China's environmental protection agencies, small-scale zinc galvanizing plants are being closed down, while larger scale facilities have been put under the direct management of State agencies.

"In the foreseeable future, we will see a sharp decrease in the number of zinc galvanizing factories. No one can know for sure

where the future of the zinc coating industry lies," Saejin says.

Saejin's R&D department in Korea has conducted a series of tests on the new aluminium ceramic coating, including a 480 hour salt spray test in which no indication of corrosion was detected. The system has also passed a series of environmental tests conducted by the Korea Test & Research Institute (KTR).

Patents are currently pending on the new process in Korea and China and an international patent is also being applied for. Saejin plans to introduce the coating at its Guangzhou, Taicang and Qingdao plants next year.

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