



CLEAN

Hypermarkets, the giant retail outlets thousands of square metres in size, have become a phenomenon in France. Selling everything from vegetables to clothing to hardware, each of the 700 hypermarkets in France employs dozens of workers who restock the shelves whilst crews from cleaning contractor companies clean the floors with electric scrubbing machines.

A hypermarket typically stays open from 9am to 10pm, which makes the late night hours best for floor cleaning. However, managers prefer to save on overnight electricity costs by scheduling restocking and cleaning in the hours just before the market opens.

This causes crowding among the restocking and cleaning staff, and the boxes and pallets on the floor hinder the efficient cleaning of the hypermarket. A better solution would involve a robotised floor scrubber which can work overnight in the dark and silent hypermarket.

Supported by EUREKA project EU 1094, Robosoft has developed a cleaning machine that can work independently, provide traditional cleaning services, and adapt to the constraints imposed by hypermarkets. The project participants include one of France's largest contract cleaning companies (Group Services France, or GSF), a French robotics development company (Robosoft), a world leader in chemical products from Germany (Henkel Ecolab) and a leading cleaning machine manufacturer from Italy (Comac).

More Efficient Cleaning

"The cleaning contractors are working with people who are doing a lot of different things, so there is a problem in properly cleaning the floor," explains Mr. Vincent Dupourque, the project leader from Robosoft. "A robot, however, can work by itself. The basic idea is to clean the floor during the night with an automatic machine, and finish it before opening the hypermarket."

The CLEAN system, which is based on Comac's C-100 floor scrubber, resembles and cleans the same as a typical scrubbing machine. It has been enhanced with a number of advanced technologies, however, including a navigation system for steering, ultrasound sensors for collision avoidance, lasers for location recognition, and, of course, an on-board computer. The robot records the series of steps needed to clean the floors, and then can be programmed to repeat the steps.

Slippage on the floor or other problems may cause the machine to go off course, so the CLEAN system determines its position by shooting laser beams at various wall markers. If the ultrasound system encounters a pallet or a person on the floor, the machine stops until the obstruction is removed.

Slower Progress, Greener Solutions

Because typical cleaning crews tend to work faster (up to 5km/hr), their scrubbing machines need very efficient and very abrasive cleaning solutions. To minimise the damage from collisions, the CLEAN machine travels at slow speeds – about 30-55 cm per second (1-2 km/hour). Consequently, Henkel Ecolab developed greener cleaning products with a slower acting chemical formula for the CLEAN scrubber.

Working together for many years, Robosoft and GSF wanted to transfer their theoretical research into cleaning robots to applications in the cleaning industry. They found Comac and Henkel Ecolab, one of their stockholders, to complete their partnership.

In the first phase of the project, Robosoft experimented with algorithms for defining the variety of tasks the robot will perform, Comac conducted research and development on a scrubbing machine capable of working with or without robotics and Henkel Ecolab tested and developed new cleaning products. After the development of a prototype, GSF conducted testing of the CLEAN machine.

Teaming Up With Large Partners

According to Mr. Dupourque, small companies such as Robosoft often need to work with much larger firms. "We are involved in a new area with a very difficult market to understand", he explains. "Only leading companies with long-term policies in robotics can create solid R&D projects involving this technology. Robosoft got in touch with such powerful partners, so this is a very strong consortium."

The partners say the CLEAN scrubber can save hypermarket cleaning crews up to 20 minutes a day, which increases productivity and adds up to large savings in time and money each year. Such a machine costs around 60% more than the standard model.

Mr. Dupourque stresses the importance of developing partnerships with international customers. "We will catch any opportunity to do it again", he concludes. "When you are familiar with international business, forming partnerships with other European countries gives you a better chance for success."

Project Profile

EU 1094
Acronym: CLEAN
Title: Independent Floor Cleaning Machine For Hypermarkets
Main Contact: sales@robosoft.fr
Estimated Cost: 1.50 MECU
Time Scale: 2 years

Participants:

France: Groupe Services France SA (www.gsf.fr)
Robosoft SA (<http://www.robosoft.fr>)
Germany: Henkel Ecolab GmbH (www.ecolab.com)
Italy: Comac SPA (www.comac.it)

