

# ISCEON® MO29

ISCEON® MO29 cools Italian sausages  
Refrigeration in food production

## CASE HISTORY

*Food preparation is one of the sectors where refrigeration is indispensable. This is where the refrigeration chain starts a chain which should then be maintained during transportation of the goods, presentation at the supermarket (or butcher) and right the way through to the consumer's refrigerator. One of the refrigerants which has been used in virtually all the links in the refrigeration chain, is R-22. This will soon end, as from 31.12.2009 it is prohibited to use or sell this common refrigerant in its virgin form for the maintenance of any installed equipment.*

Refrigeration is indispensable for Cesare Fiorucci, one of the leading manufacturers of cooked meats and sausages in Italy both for the daily production process as well as the storage of the manufactured product. Whole production halls, large and small cold stores right through to refrigerators are cooled around the clock. There are very diverse methods employed, but the majority of cooling demand falls to chillers over a range of performance capacities. Almost all machines are running today on R-22. That is about to change. Oreste Pace, Energy Manager at Cesare Fiorucci explains: "We have several tons of R-22 in use at this production plant and cannot on any account run the risk that our machines fail because of lack of refrigerant. The production is subject to strict hygiene standards, among which is maintaining the appropriate temperatures. If maintenance is required then the necessary refrigerant must be available. Otherwise we are gambling with the name and the quality of our products." Marco Valeri, Technical Director at Fiorucci, adds: "Our Engineering Team is extremely sensitive to environmental issues. Therefore, when the problem of R-22 replacement arose, we decided to make a move ahead of the official deadlines and to entrust our best

technicians with the task – with the support also of external experts such as DuPont. As a consequence, we put in place an internal project team, successfully led by Oreste Pace and comprising several experts from our maintenance department. By working with Oreste, our internal refrigeration team (directed by Sergio Manzini, responsible for the maintenance of the refrigeration plants at Fiorucci) and supported by DuPont, I was sure that the conversion of the chosen installation would be a success. I am very satisfied with the results and with the trial itself. Having verified all technical and economical parameters, we decided to put in place an action plan for the step-by-step replacement of R-22 in all of our company's installations. We chose DuPont's refrigerant ISCEON® MO29, which has been developed to replace R-22 in existing installations."

Pace confirms: "We now want to roll-out some pilot projects with the R-22 replacement ISCEON® MO29. If they are successful, we shall change over all plants in the next five years."

## Action plan

Within this action plan, an initial retrofit project commenced on 28th June 2007 in the Fiorucci production plant near Rome. The conversion was carried out by Fiorucci technicians. An external refrigeration company, Impianti e Controlli, who has worked with Fiorucci in maintenance for many years, was also present, together with representatives from DuPont, manufacturer of the ISCEON® refrigerant range, and Rivoira, supplier of the products in Italy. First a chiller of 29 kW nominal capacity and a refrigerant charge of about 100 kg was selected. The machine provides cooling for a large cold room where pork for the production of sausages is prepared. The temperature in the cold store is about 4°C. When evacuating the plant, the technician found an abnormality: "Despite taking care in removing the refrigerant the pressure did not fall enough according to the gauge display. At first we could not explain what was causing it", said Sergio Manzini.

Shortly afterwards we had the solution to the puzzle. The shaft seal on the twenty year old chiller had not survived the evacuation. Manzini said: "Now we are doubly relieved that we decided to changeover our existing R-22 plants. Maintenance work is fundamentally always inconvenient. At least now we do not have to spare a thought as to whether there is enough refrigerant available."

## Cost efficiency

After repairing the seal, the conversion was carried out quickly and there were no problems. The plant continues to run with mineral oil and, apart from changing the filter dryer, no other technical modifications were necessary. Oreste Pace is satisfied with the result: "After this successful pilot project we want to convert a somewhat larger plant. We are ideally prepared for the impending R-22 ban and are at the same time making our contribution to protecting the ozone layer."

## Plant data

Company: Cesare Fiorucci s.p.a.  
Plant: Water cooled Dell'Orto / Frigomeccanica Chiller, year of construction 1981  
Cold room for meat preparation for sausages  
Oil: Mineral oil Castrol Icematic 29  
Compressor: Open STAL piston compressor, Model P4, 29 kW nominal capacity

Parameter	R-22	ISCEON® MO29
Cold store temperature	4 °C	5 °C
Charge	100 kg	85 kg
Compressor discharge temperature	70.3 °C	54 °C



### Charging (Sergio Manzini)

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### Fiorucci

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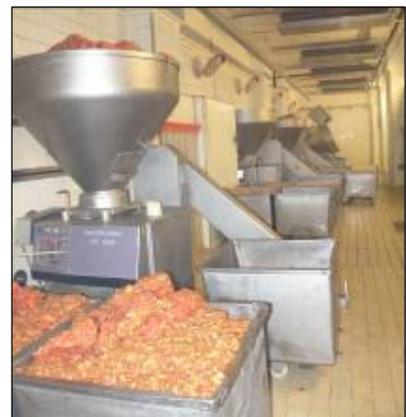


### Sausage

Whole production halls, large and small cold stores right through to refrigerators are cooled around the clock. There are very diverse methods employed, but the majority of cooling demand falls to chillers over a range of performance capacities. Almost all machines are running today on R-22.

### Meat process

For the first conversion to ISCEON® MO29, a chiller of 29 kW nominal capacity and a refrigerant charge of about 100 kg was selected. The machine provides cooling for a large cold room, where pork for the production of sausages is cut up and prepared. The temperature in the cold store is about 4°C.





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