

# Refrigeration Contractor M&J Hits the Ground Running to Complete a Fresh Food and Produce Market

**David Goodwin**

**Rescuing a large retailer from making mistakes with its refrigeration plant, M&J Refrigeration was given only six weeks to complete the extensive installation of refrigeration plant and equipment and merchandises and delicatessen display cases.**

Fresh Food and produce markets are a new retail phenomenon in the outer areas of Melbourne. Melton is 40 km north-west of the Melbourne CBD and 60km east of Ballarat. Its mainly blue collar population comes from diverse ethnic backgrounds used to buying fresh food and produce every day.

The Managing Director of M&J Refrigeration, Jos Jeanne, told *Celsius* fresh produce market caters for not only for fruit and vegetables, but has a delicatessen and one of the largest butchery he has seen outside a meat processing plant.

The Western Fresh Wholesale Produce Market is owned by three partners, Frank (Francesco), his brother Marchello Mastroianni and Enzo Lucrellie. They also run several other supermarkets around Melbourne.'



*The Western Fresh Wholesale Produce Market at Melton before it opened*

The partners had been retailing in Melton area for ten years, Frank Mastroianni told *Celsius*: "Our first supermarket was at the Woodgrove Shopping Centre. We have outgrown this location. The management were also asking a \$1000 a m<sup>2</sup> compared to large supermarket chains who were getting \$80 a m<sup>2</sup>.

"We cater for a growing population of young blue collar families in Melton. This is a mortgage-belt area and these people like to buy fresh fruit and vegetables and their meat in bulk and the Melbourne markets are a long way away. We run other supermarkets around Melbourne but this is the first fresh food and produce market. Because of its large fruit and vegetable coolroom we are using it as a distribution and storage area for our

other supermarkets around Melbourne," Frank said.

"We believe our fresh food and vegetables are a higher quality and fresher than the larger supermarkets. Our vegetables are delivered each day from Fitzroy Markets in Melbourne."

M&J picked up this project from one of the supermarkets the partners own in Caringal near Frankston on the Mornington Peninsula. "They have done very well with all the supermarkets they have run," said Jos.

"The two brothers are butchers by trade. They found an ideal location in Melton in a large building that had been a Bunnings hardware outlet. The rent from the landlord who owned the property was good and they started fitting-out and building the five coolrooms and boning room they needed and now there is a huge difference from what the place looked like inside originally."

The job was scheduled to run eight week but the official opening was brought forward two weeks before Easter this year. "There is a long weekend with three big shopping days. In the six weeks we have worked in Melton we have done a lot of work. At one stage I had six staff on the job when all the merchandising and deli cases came in but after that I have had two tradesmen working there doing the compressor work," Jos said.

"The whole building is quite large at 1500 m<sup>2</sup>. The area alone is 1200 m<sup>2</sup>. Before I came on the scene the owners were looking to refrigerate the job with 20 small 4 HP

(2.98 kW) condensing units. I told them if you are going to spend that much money you need to be energy efficient because for a market this size efficiency is very important. The other thing that concerned me was keeping the plantroom noise down because of the residential location.

"We had to hit the ground running on this project when we came back from the Christmas break. There were delays because other contractors were coming in to do work on the floor and the ceiling. There were three weeks we couldn't work."

## The Compressors

The Copeland compressors selected for the project are six cylinder reciprocating compressors and they are quieter and because the plant room is quite exposed on the roof of the building in a built-up area. The Regional Manager Australia/New Zealand, Stuart Smith, at Emerson Climate Technologies in Sydney. Stuart recommended the European designed Standard Reed

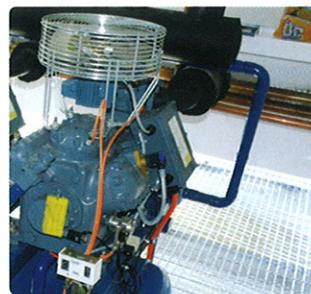
Valve Plate Semi-Hermetic D6SL2-250X- AWM/D six cylinder reciprocating compressors.



*The medium temperature rack with Copeland Standard Reed Semi-Hermetic D6SL2-250 AWM/D Compressors*

"Each D6SL2-250X- AWM/D compressor weighs 216 kg. The dimensions are 740 x 540 mm and a height of 490 mm," Stuart explained.

"The low temperature compressors have additional head cooling from a 70W vertical air-flow fan. There is a 100 Watt internal crankcase heater and discharge temperature protection with a head PTC sensor."



*One of the Copeland low temperature compressors head cooling from a 70W vertical air-flow fan.*

Jos needed 325 hp (242.45 kW) for each cool room. "The refrigerant used in the plant is Freon (R404A)," Jos said.

"I like compressors with multiple head cylinders rather than just two cylinders. I feel they are more balanced as far as vibration is concerned."

## The Coolrooms

The coolrooms were built first by a separate contractor. According to Jos Jeanne there are six coolrooms, including a freezer room 9.4 x 8.9 m by 3.8 m highly and fish and delicatessen coolrooms are both 4x 4.8 m and 3.8 m high. There is a poultry coolroom is 6 x 8.9 m and 3.8 m high and alongside it the meat coolroom is 8.4x 8.9 m and 3.8 m high and a ripening room 6.5 x 9 m and 4.8 m high. The large fruit and vegetable storage room where produce for other of the company's other supermarkets is stored is 10 x 9 m and 4.8 m high.

The IGA meat cool room at St Albans (March 2007 *Celsius*) was a quarter the

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size of this. "The big meat prep and boning room is the biggest I've seen in any retail application I have worked on. It is a massive 28 x 6.9 m x 3.8 m high and there are times when the room is packed full of carcasses with fifteen butchers," Jos said.

**The Condensers**

The project needed quiet and energy efficient condensers so Jos Jeanne asked John Mignano to recommend a various models "The extraordinary efficiency of the EHV 63 F 234 model was suggested, This model can be mounted horizontally suiting the roof area of the market.

"The performance of the heat exchanger is given by a combination of fins and a special tubes configuration. The new heat exchanger give high performance and need less air flow. Quiet motors produce low noise operation reduces internal circuit volume and needs less refrigerant.



*the eight fan LU-VE EHV 63 F condenser unit on the roof of the market*

"LU-VE's patented coil suspension system eliminates tube contact with the condenser frame giving full protection for the coil tubes during the condenser transport, installation and operation

"We have selected a LU-VE model EHV 63F 234 condenser giving an output of 530 kW. The 10 Hidria fans in this unit are HEF sickle blade 318-4-0014 model 630 mm diameter axial fans with 1,360 r/min, on high speed and 1,000 r/min on low speed," John said.

"New high efficiency fan shrouds eliminate air back-flow reducing noise. Each fan section is separated from the others fan guards conforming to safety standards.

"The smaller low temperature condenser is an EHV 63F with an output of 325 kW and eight Hidria HEF fans and a T of 15. The medium temperature condenser weighed 942 kg and the low temp 776 kg. These were placed on the roof by crane."

"Because the supermarket is in a built-up area we tried to keep the unit as quiet as possible At night the noise level needs to be 48dBA. The unit is fitted with the new HEF Hidria sickle blade fans. We needed a very small GD for a very quite operation. With the Hidria fans it is an added bonus," Jos said.

**The Evaporators**

The evaporators selected by LU-VE in the meat preparation area are some

of the biggest in the range the SHDS 368N32. They draw the air up in the middle of the unit and blow it out across the ceiling and away from staff and gently down the side.



*The beef coolroom with LU-VE SCH3272 E50 Unit Cooler evaporators*

There were various models selected for the project depending on the temperature range and the size of the room and these have certain features in common, according to John Mignano. "The combination of ripple finned tube and "Turbofin" has been optimised to give good heat exchange coefficient. Our hitec LU-VE Unit Coolers are manufactured with the following features : low motor consumption reduction of internal circuit volume and refrigerant volume and overall dimensions reduced," said John.



*The large meat boning room has a LU-VE SHDS 368N32 evaporator which moves air up through its centre sending cold air out the sides and not directly onto staff below.*

"High performance and low energy consumption fan motors are lubricated for life and thermally protected. Steel galvanised casing on each unit cooler is epoxy- polyester powder coating for corrosion resistance.



*The freezer room with two LU-VE NHI 336 E4 Unit Coolers*

"Other features include: reduced dehumidification; reduced frost formation; increased air throw; greatly reduced internal volume; low noise levels; low energy consumption and very compact overall dimensions."

**System Control**

All the units at the supermarket are rated for 43°C ambient conditions. It is very hard to set it up for 12 L/min

head pressure so we will use a Danfoss controller with a variable speed drive," said Jos.

The fans controlled by Danfoss electronic EPR's ( Evaporator Pressure Regulator). "All the controls including the racks and temperature controls are connected to the Danfoss the EPR system. It's a good system and we have used it in the past and it's easy to program and monitor. If an electronic part fails it's not always easy to get a replacement the same day or on a weekend. It's not the sort of part to keep in stock so we can back it up with a normal solenoid temperature control.



*The fresh fruit displays and dairy cases*

"With the Danfoss EPR we also have remote communication by PC and if there is a power failure the system puts out an alarm for the power and the refrigeration. There is at least 400 amps if all the coolrooms go down.

"All my keys for the system are in the roof so we don't have to make adjustments down stairs.



*The large fresh food and produce storage coolroom with LU-VE S3HC 362E 50 Unit Coolers top right*

"I was very worried about the noise which was a big issue. The system is fairly quiet at night giving a noise level of just 48 dBA. I'm very happy with the noise level of the equipment," said Jos.

"Since opening the partners have been very happy with the plant and equipment and Frank Mastroianni said it was even better than he expected."

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