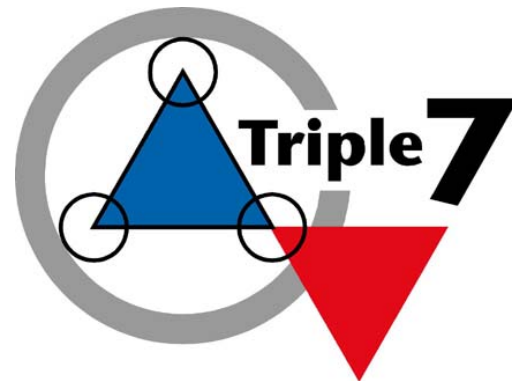


Triple-7: Today's High Capacity Coil Pattern

Lordan, developers and manufacturers of finned coil heat exchangers, have introduced the Triple-7 — an advanced coil pattern providing higher capacity than any other coil pattern in the market. According to Jano Tyroler, Lordan's marketing manager, the Triple-7 coil pattern owes its exceptional merits to —



- 7-mm tubes — smallest possible tube diameter for finned coils
- Equilateral tube arrangement
- Optimal ratio between tube diameter and tube distance

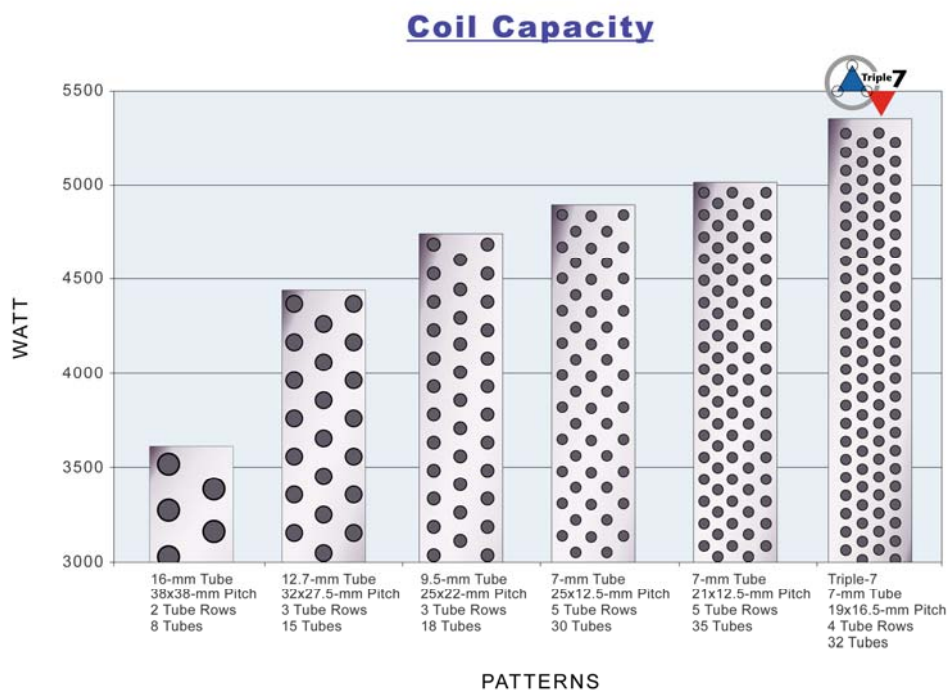
Towards small diameter tubes

Finned coils appeared with the introduction of the first air conditioners. Since then, the capacity of finned coils has been improved by manufacturing the coils with smaller diameter tubes.

The first four columns in the graph below show the capacity of four coils with decreasing tube diameter. Coil capacity increases as tube diameter decreases.

- Decreased tube diameter, combined with reduced distances between the tubes, results in more tubes per fin cross section.
- The increase in the number of tubes provides greater primary surface and the reduced distances between tubes leads to higher fin efficiency.

These properties are responsible for the higher capacity of small diameter tubes.



Note: Capacity is calculated for evaporators with 0.05m² face area and same depth, operated with a high performance fan. The calculation assumes louvered fins and rifled tubes. Condensers and heater coils yield the same results.

"It is interesting to note that the first three coil patterns are still largely used in the market, despite the advantages offered by small diameter tube coils," notes Tyroler. He says that some in the industry believe that large coils should be produced with large diameter tubes, and likewise, small diameter tubes are only suitable for small coils.

"This belief stems from concerns relating to excessive refrigerant or water pressure drop in large coils with small diameter tubes. However, pressure drops can be reduced by applying more flow circuits," says Tyroler. In fact, Lordan produces high performance, 2.5 m long condensers, evaporators and heaters using its proprietary Triple-7 coil pattern.

Improved capacity by better air pressure control

The first 7-mm tube coil with a tube pitch of 25 x 12.5 mm was introduced about 10 years ago, and was followed by the introduction of a 21 x 12.5 mm tube. These two tube pitches are the most common among the new 7-mm tube coil patterns available today. (See the last three columns of the graph.)

The Triple-7 coil pattern provides a significant capacity improvement compared to other 7-mm patterns. "Its unique design stems from better understanding of the variables affecting air pressure drops," says Tyroler. "Resistance to airflow in a coil is proportional to the number of rows deep. In effect, the Triple-7 coil, with four rows deep, has a 20% lower air pressure drop compared to five rows deep coil."

In addition, resistance to airflow depends on the amount of space between two adjacent tubes. The Triple-7 has the largest gap between two adjacent tubes resulting in the lowest resistance to airflow.

"With the Triple-7 coil, lower resistance to air flow allows higher air velocity using the same fan." In other words, the three 7-mm tube coils have the same fin area and nearly the same tube area, but the Triple-7 provides increased performance due to higher airflow.

***Higher airflow results
in better performance***

The Triple-7 coil's increased capacity also results from the arrangement of the tubes in an equilateral pitch. For the same number of tubes in a given fin size, the equilateral pitch produces the highest fin efficiency. Simply put: the heat travels the shortest possible distance from the fins to the tubes.

The Triple-7 coil provides higher capacity and occupies less volume than any other coil. "With its light weight and reduced refrigerant requirements, it represents a substantial saving – both in space and cost," concludes Tyroler.