

™Turbofin TM

Nitrogen refrigerant technology for small scale LNG



Why Turbofin™?

Turbofin[™] provides the optimal Total Cost of Ownership for small scale applications.

Flexibility

Benefit from smooth nitrogen cycle operation, guaranteed by:

- Proven and reliable machinery with low maintenance
- Single component, non-flammable and widely available gaseous refrigerant
- · Large turndown range and fast start-up and shutdown.

Streamlined permitting

Turbofin[™] makes siting and permitting easy with its standard Nitrogen cycle.

Brought to you by the leader in cryogenics

Air Liquide's cryogenic technologies have been at the heart of the company for more than 110 years, including 50+ years of experience in LNG (pioneering base load in Algeria).

We offer:

- Operational know how, through vast experience our company has with 400 large scale plants.
- A full range of cryogenic expertise from design and manufacturing of the equipment to start-up and operation.
- Unique manufacturing competencies through our own world class manufacturing centers for lean cold boxes fabrication.
- Global sourcing capabilities, including purchasing, quality management, logistics.
- A complete range of services throughout the lifetime of the plant: spare parts, site services, production support, engineering services and long-term services agreements.

Turbofin[™] 75: 75,000 tpa / 120,000 gpd Turbofin[™] 150: 150,000 tpa / 250,000 gpd

Standard design

Off-the-shelf to minimize cost and delivery time

Fully packaged

Optimized logistics and plug-and-play installation

Lean project execution

Supply chain, manufacturing and factory acceptance tests are performed at Air Liquide workshops, securing schedule and quality.

Aftermarket Services

Extended post commissioning / start-up support and operators training



Standard Turbofin™ 150 liquefier

Designed with cutting edge technology

Cold Box

In-house design and manufacturing of the cold box and the brazed aluminium heat exchanger with full spectrum of competencies

Machines

Best machine frames optimization between pressures and cycle flows

Integration

Leveraging all possible synergies with the site environment, infrastructure and off-take

References

Number one in LNG peak shaving applications in the Americas

Feed Gas Gas Treatment HC Condensates Brazed Aluminium Heat Exchanger LNG Storage

Turbofin™ technical snapshot

- Turbofin[™] solution uses a Brazed Aluminium Heat Exchanger fitted into a compact Cold Box and Turbo-Expander as key equipment.
- The fluid used in the single refrigeration cycle is Nitrogen.
- Nitrogen is compressed, precooled and let down in two stages through two expanders coupled with compressors (Turbo-Expander).
- The work generated by the expansion is recovered to contribute to the compression of the Nitrogen.
- The let-down of Nitrogen generates cooling duty that is exchanged in the Cold Box and allows Natural Gas pre-cooling, liquefaction and sub-cooling.



