TORONTECH


# LOW TEMPERATURE COOLING CHAMBER FOR DWTT IMPACT SPECIMENS

Low Temperature Cooling Chamber for DWTT Impact Specimens DWTT-LTC80 is a newly developed compressor refrigeration system designed by our company to meet the low-temperature device requirements outlined in ASTM E436, ASTM E208, JB-5376-1991, Technical Requirements of Low Temperature Constant Temperature Tank, Steel-Drop-Weight Tear Test Method.

DWTT-LTC80 utilizes cascade compressor refrigeration technology, the heat balance principle, and a circulating stirring method to achieve uniform cooling and maintain a constant temperature for test specimens. It fully complies with the various temperature control specifications required by relevant standards.

DWTT-LTC80 features single-chip microcomputer technology for precise control, with a digital temperature display, automatic temperature regulation, timing, and alarms. It is simple and safe to operate, offering fast cooling speeds, large capacity, and high accuracy in temperature control. This makes it the ideal equipment for cooling and preserving metal material samples during low-temperature impact tests. Additionally, it can be used for other low-temperature detection and testing purposes.

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## APPLICATIONS

### Applicable Standards

1. ASTM E436-2003: Standard Test Method for Drop-Weight Tests of Ferritic Steels
2. ASTM E208-2017: Standard Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels
3. JB-5376-1991: Technical Requirements for Low Temperature Constant Temperature Tank

## FEATURES

- **User-Friendly Design:** DWTT-LTC80 is designed with a split structure, forming an "L" shape with a high and low side. The high side houses the control panel, making it easy to observe, set temperatures, and operate. The low side contains the freezing tank, which is convenient for placing and securing samples. The height is aligned with the impact testing machine, allowing quick placement of samples in the specified position.
- **Advanced Refrigeration System Components:** DWTT-LTC80 is equipped with high-end components, including the original France Tecumseh fully enclosed compressor. These high-quality core components ensure long-term stable operation and a long service life. The high-efficiency external rotor condensing fan offers a long life with low noise. The brazed plate heat exchanger is compact and highly efficient. Additionally, the system features solenoid and expansion valves, and the refrigerant is environmentally friendly.
- **High Temperature Control Accuracy:** DWTT-LTC80 includes a high-precision temperature control instrument with automatic PID adjustment for maintaining a constant temperature. It features a high-performance platinum resistance PT100 sensor with a stainless steel probe for stable performance and high precision. The stirring motor is fully enclosed, with low noise and long life, and is capable of operating in low-temperature, high-humidity environments. The medium in the tank is forcibly stirred for good fluidity, and the high-quality stainless steel heater is safe and durable. These high-quality components ensure minimal temperature fluctuations and good uniformity.
- **Large Sample Capacity:** DWTT-LTC80 comes with two specimen baskets and can freeze up to 22 standard specimens of size (305±5) x (762±1.5) x (plate thickness 3~40) in a single cycle. It can also accommodate different numbers of NDT samples based on the available freezing space:
  - P-1: (360±1) x (90±2) x (25±2.5)
  - P-2: (130±1) x (50±1) x (20±1)
  - P-3: (130±1) x (50±1) x (16±0.5)
- **Convenient Operation:** DWTT-LTC80 is equipped with universal casters at the bottom, making it easy to move. The sample baskets facilitate easy placement and removal of samples. A liquid discharge port allows for convenient recycling of the cooling medium and cleaning. The system also includes temperature alarms and insulation timing, helping the operator to manage tasks efficiently.
- **Comprehensive Protection Features:** DWTT-LTC80 includes various protection functions such as overload protection, leakage protection, phase loss protection, phase sequence protection, grounding protection, compressor overload protection, system pressure protection, medium over-temperature protection (anti-drying), and a unique

expansion system.

## TECHNICAL SPECIFICATIONS

| Configuration | | |
|---|---|---|
| Compressor | Tecumseh with original packaging fully enclosed compressor | Two sets |
| Condensing device | High efficiency finned condenser | One piece |
| | External rotor condensing fan | One piece |
| Plate heat exchanger | | One piece |
| Dry filter | | Two pieces |
| Solenoid valve | Solenoid valve | One piece |
| Throttling device | Danfoss thermal expansion valve | One piece |
| Refrigerant | Fluorine-free environmentally friendly refrigerant | |
| Heat preservation | Rigid polyurethane foam | |
| Stirring device | | One set |
| Temperature control device | High-precision intelligent digital temperature control instrument | One piece |
| | High-precision platinum resistance stainless steel probe | One piece |
| | Stainless steel heater | One piece |
| Stainless steel sample basket | | Two pieces |

## Dimensions

Low Temperature Cooling Chamber for DWTT Impact Specimens

| | Technical Specification | |
|---|---|---|
| Temperature control range | +30～ -80℃ | |
| Temperature control accuracy | ≤±0.5℃ | |
| Temperature uniformity | ≤2℃ | |
| Cooling speed (when room temperature is 25℃) | Room temperature～ 0℃ | About 1.3℃/min |
| | 0℃～ -40℃ | About 1.1℃/min |
| | -40℃～ -60℃ | About 1.0℃/min |
| | -60℃～ -80℃ | About 0.8℃/min |
| Heating speed | About 2℃/min | |
| Size of cooling tank | About 60L | |
| Digital timer | 1 minute ~ 9999 minutes, resolution: 1 minute | |
| Effective size of cooling tank | 570×390×230mm (length x width x height) | |
| Specimen basket | 2 pieces | |
| Number of specimen can be placed | 22 pieces (Falling impact specimen size : 305×76.2mm, thickness is according to original material; Specified specimen size in national standard, : 305±5×76.2±1.5mm) | |
| Digital timer | 1 minute ~ 9999 minutes, resolution: 1 minute | |
| Cooling medium | Absolute ethyl alcohol | |
| Dimension | 1510×1010×1160mm (length x width x height, not including the protuberant part) | |
| Power supply | Three phases five wires, 380V, 50HZ | |

| | Technical Specification |
|---|---|
| Power | 14kW |
| Operating environment temperature | 5℃～ 30℃ |

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