Grain Cooling Solutions

Natural Grain Preservation-Guaranteed Quality & Quantity

grainTECHNIK
Each grain matters
Grain Technik Pvt. Ltd. is an Indian company specialized in the field of Grain Cooling technology. The company was formed by a group of technocrats with many years of experience in building heavy duty air conditioners using the latest technology. Together with the support of Indian Institute of Technology & Certified Govt. Agricultural bodies, the company is dedicated to put an end to wastage of grain during storage and to eliminate harmful unhygienic fumigation methods while storing freshly harvested grain.

GrainTechnik is the only Indian company to have invested in this line to provide technology transfer suitable for Indian weather conditions. We design, manufacture and supply grain Coolers and temperature monitoring systems. Our technologies are customized to each site condition. Our product is a result of several years of Research & Development assisted by feedbacks received from prevailing technologies at farmer & milling locations & in depth understanding of grains through reputed Agricultural Universities. Our Primary focus remains to build technology products that are cost effective, sustainable and highly reliable for Preservation of grain.

For us, each grain matters. We are aware of the amount of the nation’s grain that is lost not only in quantity but also quality due to chemical treatment, improper storage techniques with gunny bags, warehouses and silos. Grain Technik’s vision is to accelerate the world’s transformation to natural preservation of grain.
OUR VISION IS TO ACCELERATE WORLD’S TRANSFORMATION TO NATURAL PRESERVATION OF GRAIN

Each grain matters
Our product is a result of several years of Research & Development assisted by feedbacks received from prevailing technologies at farmer & milling locations & in depth understanding of grains through reputed Agriculture Universities. Our Primary focus remains to build technology products that are cost effective, sustainable and highly reliable for Preservation of grain. Our primary focus was to assess the root cause of the nation’s stored crop wastage and the best suitable method to preserve grain without losing its nutritional properties. Our core product, the Grain Cooler utilizes the latest technology in the field of refrigeration to control temperature & humidity levels of the grain, stored in either silos or warehouses. By achieving the desired temperature & moisture levels, the grain can be kept safe from any insects, fungus or any losses associated with drying. The GT-Series Grain Coolers are custom built as per environmental conditions & customer requirements. Using the most up to date techniques such as VFD Driven Motors & Compressor Discharge Recycle, we ensure that our product is not only more efficient in operation but keeps running costs to a minimum.

**Advantages of GT- Cooler**
- Maintaining harvest freshness
- No requirement of fumigation and other chemical treatment for insects
- No risk of fungus
- Eliminating drying substance losses
- Moist grain can also be dried using economical drying mode
- No discoloration of grains
- No risk of hotspots
- Pallets Cooling to eliminate breakage and stress cracks
- High germination quality
- High standards of safety & ease in operation
- Plug and play unit
- Weather independent operation
A food grain, apart from being our most essential staple requirement, is also a high contributing factor to any nation’s wealth. It is farmed and harvested with great care and effort. According to the World Food Organisation, 1.3 billion tons of grains are wasted every year globally. The major causes of wastage are due to insects, fungus and drying. Grain is also a living organism, which means that when it breathes, it releases carbon dioxide, water and heat. This process leads to loss of weight and quality. The natural heat generation depends on various factors, one of them being the moisture level and temperature at which it is stored. A typical storage condition in a humid & tropical country with ambient temperatures in the range of 30-35 Deg C & Grain moisture content of 15% would lead to heat generation of about 1MJ/T per day, continuously increasing every day.

In addition to grain respiration, insect infestation is also a consequence of natural heat generation. The grain infesting insects being very temperature sensitive, multiply rapidly in temperature zones between 23 Deg C to 33 Deg C. Temperature conditions of 15 Deg C & below are ideal to prevent breeding of most insect species. Even more so, 13 Deg C & below keeps the insects in hibernation without any activity.

Fungus development is another factor contributing to wastage of grains & is also mostly influenced by temperature, humidity and grain moisture content. When warm air from the centre of a bulk/ bin meets cold grain at the surface, condensation may occur. Moisture at the surface or in damp pockets in the bulk will encourage moulds and sprouting. These are toxic for human and animal consumption. Mycotoxin formation is also most likely between temperatures of 16 Deg C and 25 Deg C. By controlled humidity and temperature conditions, the risk of insects and fungus infestation is eliminated.

Do not let your hard earned harvest go to waste. Learn why Preservation of grain through Cooling is a must!

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Grains are relatively warm post-harvest – ideal for insect breeding and other activity. Grain, being a good insulator, loses heat very slowly which signifies that once the grain is cold it remains cold for a longer period of time.

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Effect on Insects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least</td>
<td>0°C</td>
</tr>
<tr>
<td>Greatest</td>
<td>50°C</td>
</tr>
<tr>
<td></td>
<td>Death in Week</td>
</tr>
<tr>
<td></td>
<td>Development slows</td>
</tr>
<tr>
<td></td>
<td>Maximum Insect Development rate</td>
</tr>
<tr>
<td></td>
<td>Development slows</td>
</tr>
<tr>
<td></td>
<td>No Breeding of most insect species</td>
</tr>
<tr>
<td></td>
<td>No Activity</td>
</tr>
<tr>
<td></td>
<td>Least</td>
</tr>
<tr>
<td></td>
<td>13°C</td>
</tr>
<tr>
<td></td>
<td>Death in Hours</td>
</tr>
</tbody>
</table>

Effect of different temperatures on insect
Cooling in a silo
The cooled air is distributed in the silo/flat storage through a duct system in the bottom of the silo/flat storage. As the cooled/conditioned air moves up through the grain mass the temperature in the grain is reduced, eventually reaching the set value. Grain being an excellent insulator, once cooled to a low temperature, will remain cool for a substantial time period.

## Technical Data

<table>
<thead>
<tr>
<th></th>
<th>9T-100</th>
<th>9T-250</th>
<th>9T-450</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Storage Size / Silo</strong></td>
<td>Upto 1500T</td>
<td>Upto 4000T</td>
<td>Upto 7000T</td>
</tr>
<tr>
<td>**Refrigeration Nominal Cooling Capacity *  **</td>
<td>14TR</td>
<td>40TR</td>
<td>80TR</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>3Φ, 380/415V, 50/60Hz</td>
<td>3Φ, 380/415V, 50/60Hz</td>
<td>3Φ, 380/415V, 50/60Hz</td>
</tr>
<tr>
<td><strong>Supply Air Setting Range</strong></td>
<td>10 - 20 Deg C</td>
<td>10 - 20 Deg C</td>
<td>10-20 Deg. C</td>
</tr>
<tr>
<td><strong>Refrigerant</strong></td>
<td>R-407C / R-134a (High Temp)</td>
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<td>R407C/R134a (High Temp.)</td>
</tr>
<tr>
<td><strong>Air Flow @ 1000 Pa Static Pressure</strong></td>
<td>6000 m³/hr</td>
<td>15000 m³/hr</td>
<td>25000 m³/hr</td>
</tr>
<tr>
<td><strong>Approx Dimensions (L X W X H) in mm</strong></td>
<td>2800 X 1200 X 1850</td>
<td>3400 X 1800 X 2200</td>
<td>3552 X 2300 X 2292</td>
</tr>
<tr>
<td><strong>Approx Weight</strong></td>
<td>900 Kg</td>
<td>1900 Kg</td>
<td>3600 Kg</td>
</tr>
</tbody>
</table>

* Nominal Cooling Capacity is based on following conditions:

- Ambient Temperature @ 30 Deg C
- Relative Humidity @ 60%
- Static Pressure @ 1000 Pa
- Air Supply Set Temperature @ 13 Deg C
Highly reliable combination of Semi-Hermetic compressor with automatic capacity regulation and heavy duty heat exchangers using environmentally friendly R-407C refrigerant.

Angled condenser design facing upwards with high quality fan guarantees most efficient heat exchange. Louvers on the side panels ensure air flow and restrict water entering the unit.

Completely sealed electrical cabinet with user friendly Siemens PLC console programmed to handle 11 different types of grains. Auto & manual operation modes. Angled ducting cap for smooth air flow.

Heavy duty IP-54 protection blower with Variable Frequency driven Siemens Motor. Fan speed is adjusted automatically through Variable Frequency Drive for optimized Air Flow.
GT - CLOUD
GRAIN TEMPERATURE MONITORING SYSTEMS

GT - Remote monitoring
A GT Grain Cooler is controlling both temperature and the relative humidity of the cooled air — regardless of ambient conditions — no need for using highly toxic chemicals to protect grain in storage from being damaged by insects.

The ‘GT-CLOUD’ Temperature Monitoring System can also prove to be very advantageous to our customers. The system is designed for heavy duty, highly reliable and daily remote monitoring use. Using automated live feeds to show the grain temperature & capacity, the user can adjust Cooling set points remotely to ensure efficient Cooling of stored grains.

**GT-CLOUD CABLE**

Heavy duty design cable comes with two steel cable ropes to increase tensile strength. The cables are dust and explosion proof.

The two layer heavy duty grade cable with special design ensures that replacing sensors is simple. The inner cable can be easily pulled out instead of replacing the entire cable. The unique design of the cable bracket makes for secure installation & weather proofing.

GT-CLOUD system is offered in three different versions:

**Basic Version**: The user can read the grain temperature and historical data using smart phone and computer remotely.

**Advanced Version**: Computer based monitoring that allows the user to check wide range of data in a control room. Features include temperature monitoring, grain capacity, graphical temperature change and checking historical temperature record of over a year. The system shows silo information and grain temperature. The results are displayed level wise indicated by different colors corresponding with the current temperature condition enabling the user to immediately identify if the temperature is low or high & accordingly take action.

**Silo Information**: The system shows silo information and grain temperature. The results are displayed in color that each level of temperatures. So that user will be able to quickly find out the temperature is low or high. (see Fig.1)

**Grain Capacity**: The system can collect data and calculate the grain capacity or loading in each silo. This avoids the need of unnecessary climbing on silo. (see Fig.2)

**Graphical Information**: The graph shows the change of temperature in a specified time frame. It allows the user to evaluate the historical changing pattern and assists in forecasting the future trend. (see Fig.3)

**Historical Data**: Automatic recording of grain temperature data is done on an hourly basis. The user can check the historical grain temperature at any instant. (see Fig.4)
Cloud Business Version: This version is targeted for individual business owners or corporate headquarters which have multiple sites to manage. The status of each site is reported & can accordingly be controlled nationally or internationally. The user gets all the tools of the advanced version and additionally all the benefits of the cloud monitoring system. With these features, the user can access the data from a smart phone, computer, or tablet in any part of the world, through an internet connection. Additional features like alarm / text / email notifications relating to temperature increase are available in this version.

Guaranteed Quality & Quantity
Our Service

Grain Technik Service compliments our wide range of Air Conditioning Products. We believe in supporting our customers across the world through our wide array of service networks.

- **Trial Run Services**
  We offer grain Cooler for trial run exclusively for customers in India before going for purchase.

- **Installation and Commissioning Services**
  GrainTechnik service team takes complete scope of grain Cooler installation and commissioning. Our team ensures that the users can independently & Safely operate the units.

- **Remote Monitoring Services**
  The unit can be remotely monitored with facility of displaying any faults at location of your choice. Our service team will assist in troubleshooting.

- **Annual Maintenance Contract**
  The first benefit of preventive maintenance is that it increases the efficiency & life of your equipment. It conserves energy and prevents breakdown of the equipment during critical times of operation. Regular servicing & checks on all refrigerant components ensure they are only replaced after completing their lifecycle & not before.

- **Unit Health Check**
  Our trained service professionals are always available to visit your site to perform a detailed unit health check. Recommended at least once in every year.

- **General Recommendations**
  Regular cleaning practice & checking of electrical connections. Fortnightly cleaning of filters. Clean outdoor Condenser Coil only with Compressed Air/Air Blower/ Cleaning Brush
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