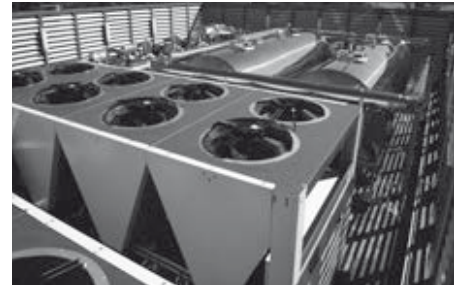




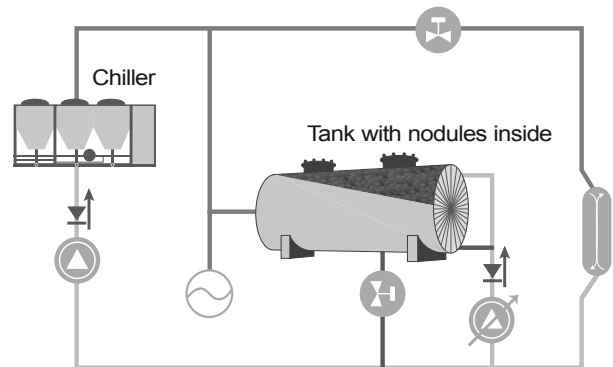
*For your systems  $\geq 500$  kW  
CIAT optimizes the design and the operation of your installation for all applications in both commercial and industrial buildings*



## HVAC SYSTEM WITH STORAGE

The Thermal Energy Storage (TES) system along with your chillers is composed of one or several tanks filled with spherical elements called nodules that contain the Phase Change Materials (PCM). The use of PCM in nodules provides very high energy density and power exchange.

	<p><b>Nodules</b> Core TES Technology Encapsulation of PCM</p>	▶	<p>Reliability Competitiveness</p>
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## UNIQUE GLOBAL PCM EXPERTISE

- PCM (formulation, nucleation, characterization, durability, recyclability)
- Packaging and encapsulation of PCM
- Envelope materials (material compatibility, ageing)
- Industrial manufacturing processes

## MONITORED & CONTROLLED SYSTEM

The control and monitoring system optimizes the operation of the installation. It helps contractors and owners to optimize energy consumption, lower CO<sub>2</sub> and greenhouse gas emissions and reduce operating costs.

### Controls

- Operating modes automatic management
- Thermal equipment regulation
- Stored energy optimization

### Monitoring

- Local and remote monitoring
- Alarm notification
- Real-time view of operating parameters

### Auto-adaptative module

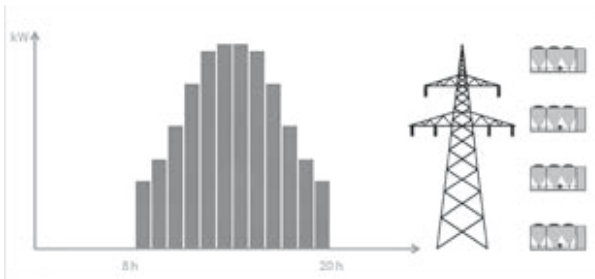
- Daily optimization
- Predictive calculation of the daily cooling demand
- Permanent operating adaptation

# Thermal Energy Storage

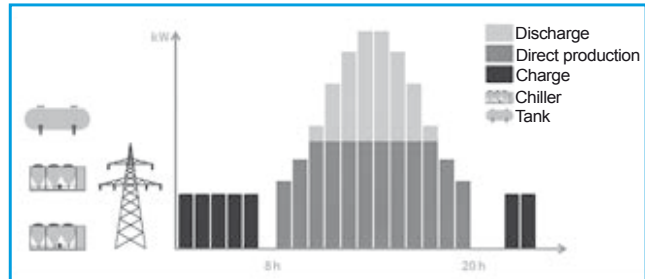
## SHIFT YOUR ELECTRICITY CONSUMPTION FROM PEAK TO OFF PEAK HOURS

### Histogram Of A Building's Daily Cooling Needs And Its Electricity Consumption Profile

Without Thermal Energy Storage



With Thermal Energy Storage



## OPTIMAL COOLING

### The expertise to tailor-make your cooling solution

#### Turnkey solution

CIAT supports consulting engineers by customizing the hydraulic layout for each project: application, operating conditions and specific customer needs. When necessary, complementary technologies such as free cooling or energy recovery are integrated.

#### Proven technology

CIAT has unique expertise in Phase Change Materials (PCM) based on over 30 years of Research & Development in partnership with universities and technical centers in Europe. This Thermal Energy Storage (TES) solution by latent heat allows TEWI\* benefits from 15% to 40%\*\*.

#### Unique expertise

CIAT engineers have unique and proven expertise, including in-depth knowledge of dual cooling and automation. The team collaborates closely with Sophia-Antipolis, Europe's largest technology park and is involved in several European research and innovation projects.



## OPTIMIZED SAVINGS

### Smart energy use for operational optimization

#### Reduced operating costs

By storing thermal energy during the night and releasing it during the day, the Thermal Energy Storage system consumes electricity at lowest prices and avoids peak times. By spreading thermal energy production over 24 hours, this solution can reduce chiller capacity by 30 to 70%\*\*\*.

#### Non-stop support

CIAT expert engineers advise and support you daily. Thanks to regular monitoring and follow-up you can optimize the operation of your cooling installation. CIAT also offers additional services (training, on-site intervention, trending...) throughout the lifecycle of your installation.

#### Smart-grid ready

By shutting down electricity-hungry energy producers on demand and forcing the discharge of the system, the TES system regulates equipment to respond to peak electricity alerts on the power grid. This solution can also be combined with renewable energy (wind turbines, photovoltaics).

\*TEWI: Total Equivalent Warming Impact - \*\* / \*\*\*Source: Measured differences between equivalent systems designed with and without TES.



→ A sustainable approach to buildings



→ A sustainable approach to buildings

# Thermal Energy Storage

This document is non-contractual. As part of its policy of continual product improvement, CIAT reserves the right to make any technical modification it feels appropriate without prior notification.

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