



Innovative solutions for bitumen logistics



Bitumen Presentation



Innovative solutions for bitumen logistics

Design Consultants & Engineers

serving the

Transport & Energy Industries

WORLDWIDE

Specialising in ...

Terminal & Depot Operations



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Specialist Containers

TEC's design and mechanical engineering team are dedicated to the design of specialised tank containers. This team has designed amongst others, the Bitutainer range of containers- *which has essentially transformed the transportation of bitumen worldwide since the 1990s*

This has been achieved by adopting the philosophy of maximising product carrying capacity within the constraints of a standard ISO shipping slot space. This unorthodox approach is widely accepted as the optimum method for the shipment of non-hazardous liquid products.

Aided by sophisticated computer programs TEC's specialised container design team are able to calculate load and stress tolerances and complete structural analysis. Working closely with the Lloyds certification department in the UK, approvals for all types of containers can be realised within a comparatively short periods

TEC has forged links and partnerships with several heavy steel product and container manufacturers in Europe and Asia. By working closely with these organisations TEC has been able to ensure a high level of quality and workmanship to complement their designs.

Experience in working in the worldwide market has enabled TEC to adapt it's approach to finding the ideal logistical solution to suit the conditions in any region.



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TEC Transportation Containers

Maximising Load Capacity and Conforming to Local Transport Regulations

Fully Intermodal – Ideal for Road, Rail or Sea Transportation





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TEC Project Design and Build

Based in Sussex on the South Coast of England, TEC was incorporated in 1987 and has actively served the transport and oil industries for the past 20 years.

Design and Supply specialised Tank Containers

Engineering and Design Consultancy

Project Manage Services for Major International Energy Companies

The core activities of the company are based around storage and transportation of bitumen and fuels using the Bitutainer™ range of products. The engineering and design consultancy division has a proven track record of leading the design and management of a variety of successful construction projects including bitumen handling / storage facilities, and logistics solutions.

Operating globally on numerous projects in the African continent, the Middle and Far East, Europe and Australia . They have successfully completed projects from initial logistics discussions, design, engineering and procurement to final installation, commissioning and operator training. Chartered engineers are also part of the team of designers and project managers, as well as marketing, sales and financial professionals.

Design : Supply : Installations : Project Management



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Design & Consultancy Services

In-House Resources...

- Chartered Engineering Staff (Mechanical)
- Project Managers
- Commercial Experts
- Logistics Experts
- Autocad - CAD Designer
- Ansys Finite Element Analysis Software
- ISO 9001 Internal Standards
- In-house Process Simulation Software (TECSIM)
- Gas Certified Engineers



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Design & Consultancy Services

Associated Resources...

- Civil Engineers
- Electrical and Electronic Engineers
- Fire System Engineers (Detection and Deluge Systems)
- Process Software Design Engineers



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Facility Installations



Project Engineering & Management



Commissioning Testing & Training



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The 30/70 Shipper Bitutainer™

**20ft x 8ft 6" High
(Fully Insulated)**

Tare Weight 6,000 kg

Capacity 27,00 Litres

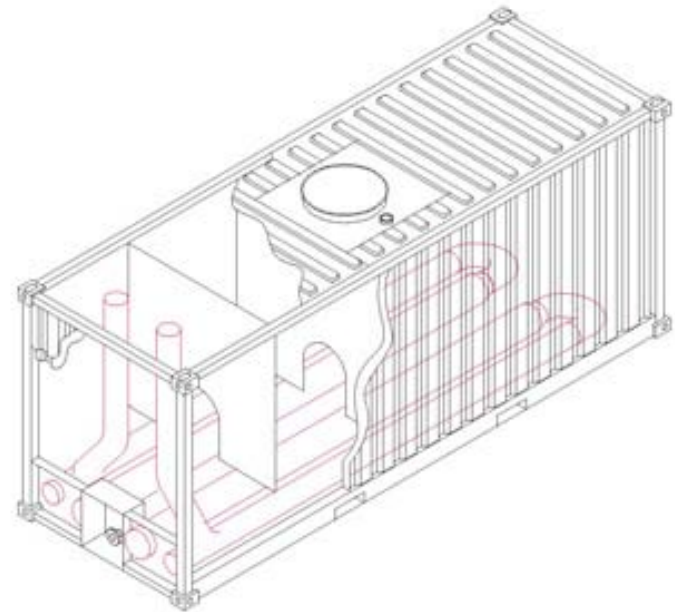


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The Bitutainer™

Bitutainer™ Facts

1. **30/70 Shipper Bitutainer holds the equivalent of 140 drums (28,000 Ltrs.)**
2. **Bitutainer™ is recyclable**
3. **Lower cost handling logistics**
4. **Ease of loading and unloading**
5. **No Health and Safety problems**
6. **Various controllable, low energy heating options available for the unique in-built heating system**
7. **Twin skinned with high value insulation in the sealed roof, floor and wall cavities.**





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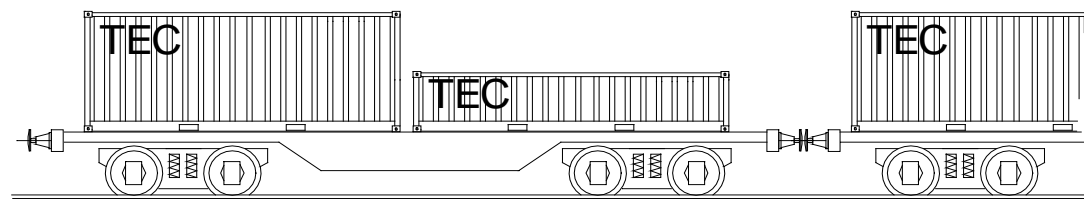
Full **Intermodal** Transportation



Road



Sea



Rail



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Bitutainer™ Handling



Container Lifters



Fork lift



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Bitutainer™ Handling



Container to Truck Handling



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Bitutainer™ Operations

Heating Systems

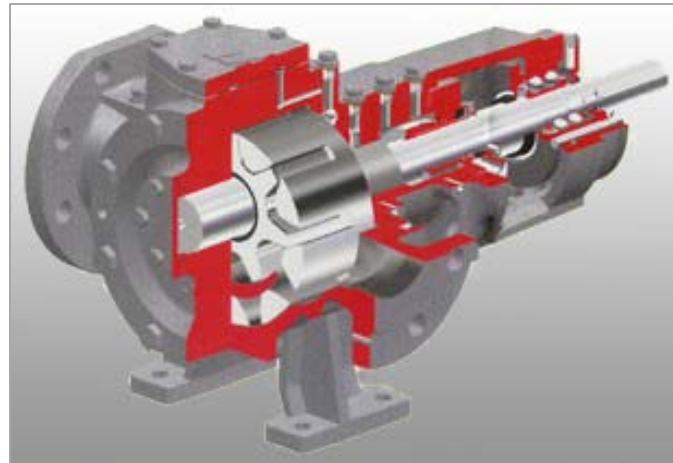
- **Diesel Direct Fire**
- **Thermal Oil**
- **LPG**
- **Electrical**



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Bitutainer™ Operations

Diesel or LPG Fired Heaters and Heated Pump Units

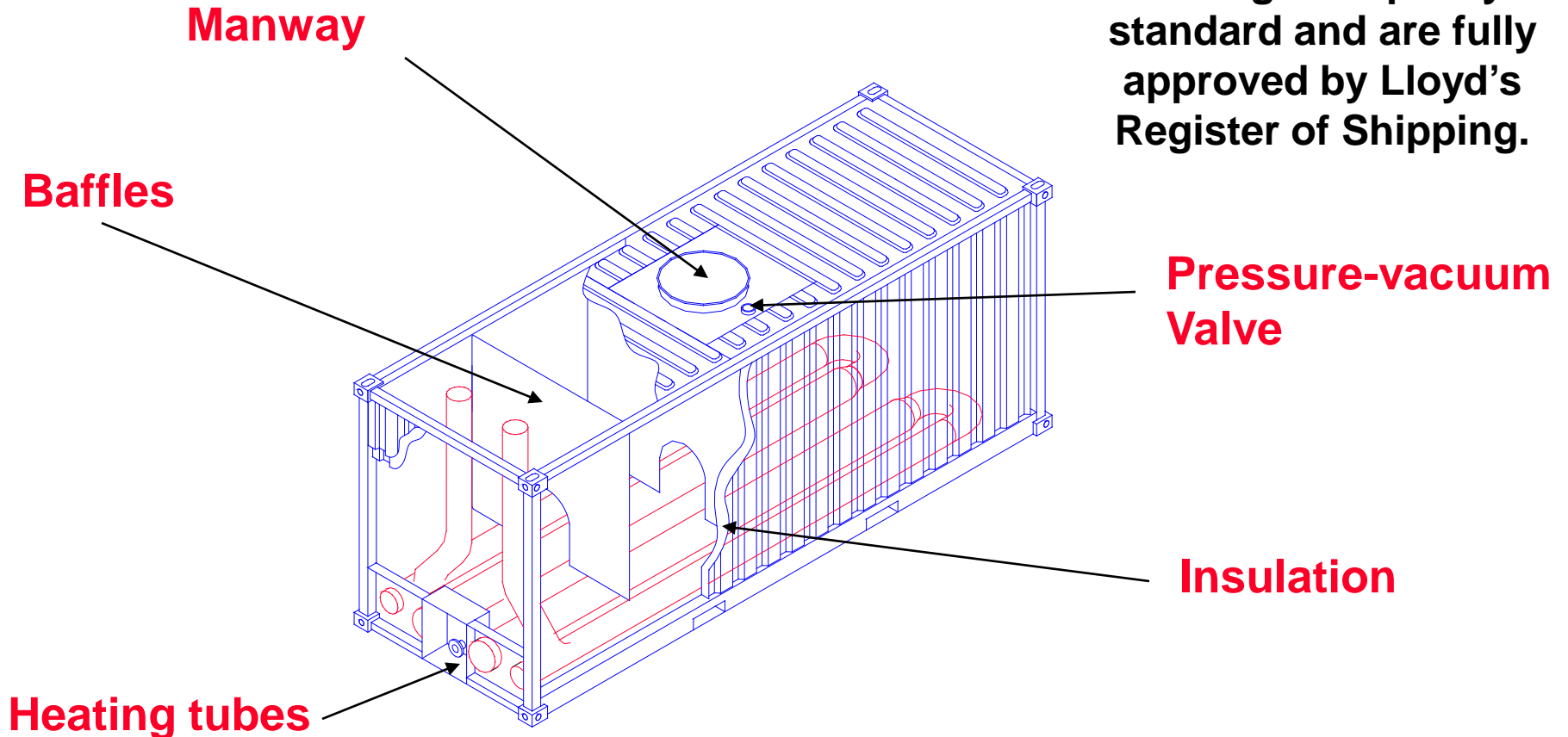




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Key Parts of Bitutainer™

Bitutainers™ are built to the highest quality standard and are fully approved by Lloyd's Register of Shipping.

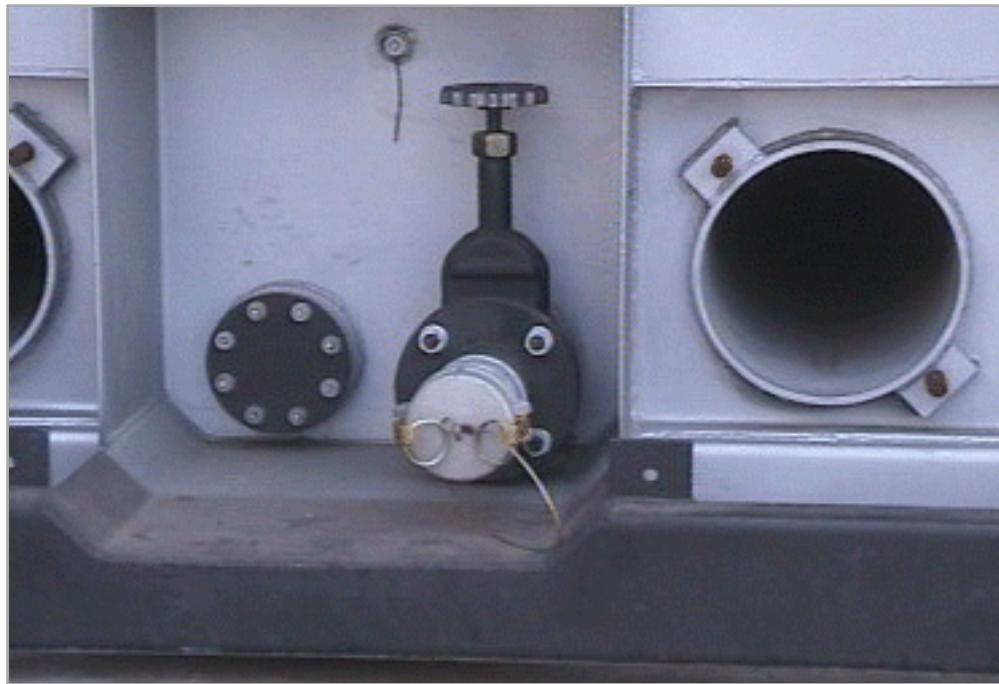




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Bitutainer Operator Interfaces

**Discharge
Valve**



Bitutainer™ heating tubes, discharge valve with camlock and point for product recirculation



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Closed for custom sealing



Easy Access

Manway





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**Pressure Vacuum
Protection**



All containers protected from over-pressure and vacuum – Bursting disk provide ultimate protection



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**Ultimate Over pressure
Protection Approved by
Lloyds**



Bursting disk located under the manway making inspection simple.



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Flue Stack Operation when Heating



Ready to Ship



Ready to Heat

To minimise rain water ingress to the heater pipes and to allow customs sealing a unique lift out flue has been designed.



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Comparing the various methods of
moving bitumen products
with the **TEC Bitutainer™**



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Bitumen Delivery

By Drums

Advantages

1. Suitable for small quantities
2. Suitable for intermittent deliveries
3. Suitable for locations with difficult access



Only 80 drums fit into a 20ft shipping container



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Disadvantages of Bitumen Delivery by Drums

The Costs of Drumming

- 1. Purchase cost of Drums and Caps**
- 2. Cost of Drum Filling**
- 3. Cooling time**
- 4. Storage Space and Handling Costs**

The Costs of Decanting

- 1. Cost of Drum Decanting Equipment**
- 2. High Energy Inputs**
- 3. HSE Issues**
- 4. Environmental Issues (Drum Disposal, Spillage around Decanter)**





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Bitumen Delivery by Hot Ship

Advantages

- 1. Ideal for large parcel bulk deliveries**
- 2. Suited to existing bitumen terminals**

Disadvantages

- 1. Lack of Hot Ship availability.**
- 2. High cost of erecting unloading jetty and pipework**
- 3. Customer may not wish to invest in relatively high volume shipment**
- 4. Availability of storage tanks may restrict number of grades which can be supplied or tanks are not of large enough capacity**
- 5. Frequency of delivery may have an adverse effect on heating costs**
- 6. Large quantities of product must be kept heated**



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Bitumen Delivery by Bitutainer™

The Bitutainer™ Solution

- 1. Use the Bitutainer™ fully intermodal transport version to deliver by container ship and create a storage depot.**
- 2. Bitutainer™ Storage Tanks for fast track relocatable storage depot with a choice of 30 M³ and 60 M³ capacity container tanks.**
- 3. Where a ship to shore pipeline is not available, TEC's unique hot ship unloading module (transfers to inland storage or temporary Bitutainer™ Storage Tanks) is the ideal solution.**
- 4. Storage depot can then decant into local tank trucks or TEC's half height Bitutainers™ for delivery to difficult access sites.**
- 5. Use self contained Bitutainer™ with onboard heating for hot product delivery to remote sites.**



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Bitumen Delivery by Bitutainer™ by Comparison

Features to consider include:

- 1. Sloping floor for maximum withdrawal.**
- 2. Double locked manway with safe dipping point.**
- 3. Reliable discharge valve.**
- 4. Facility for single or double temperature sensing points.**
- 5. Very strong double skin construction with insulation on all sides**
- 6. Protection around the sensitive loading and unloading positions.**
- 7. Cost advantage of transporting 28 tonne versus 19/20 tonnes in the same slot.**
- 8. Cost comparison between the Bitutainer™ and other conventional ISO containers or dedicated truck tankers.**



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40ft Bitutainers™ for Storage and Distribution Facilities



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**40ft
Bitutainer™
Storage
Tanks**

**60 m3
Useable
Capacity**

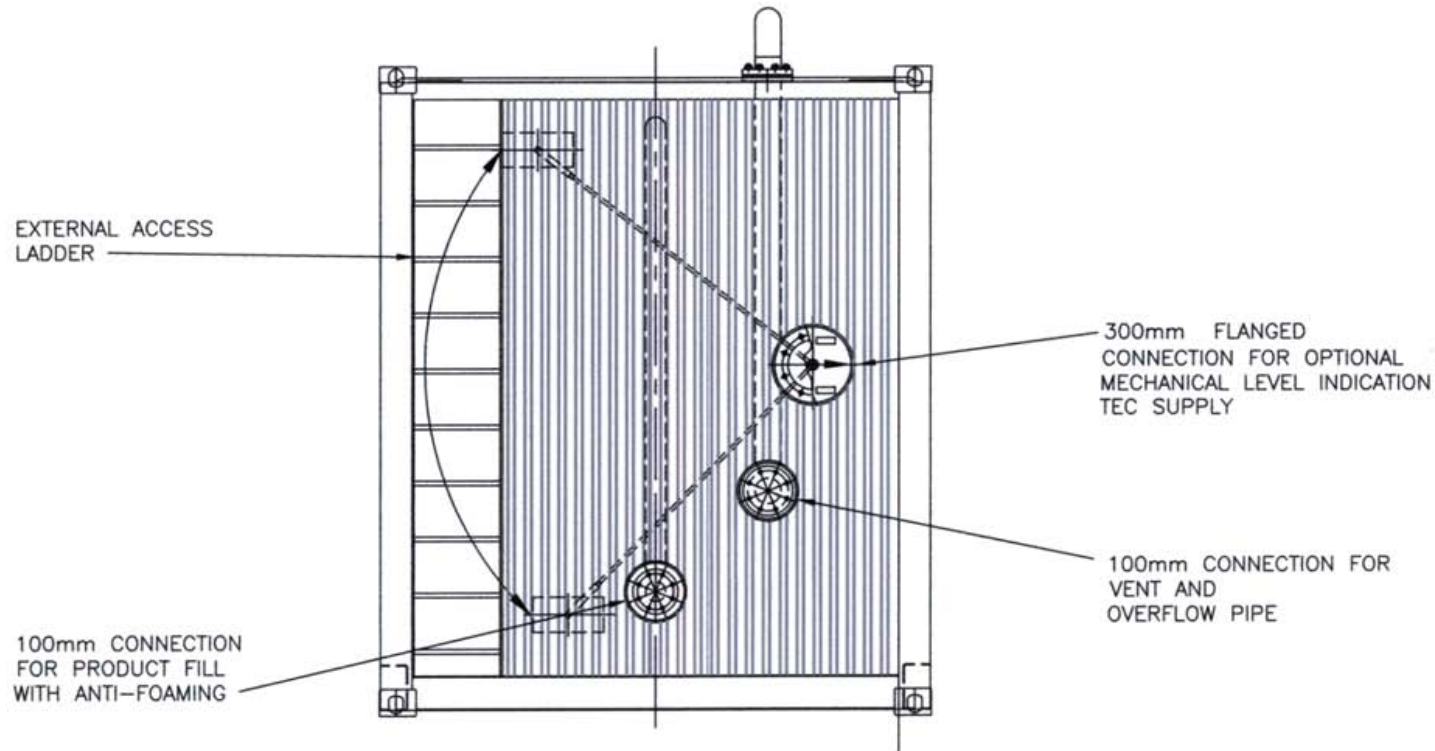


Bitutainer™ Storage Tanks



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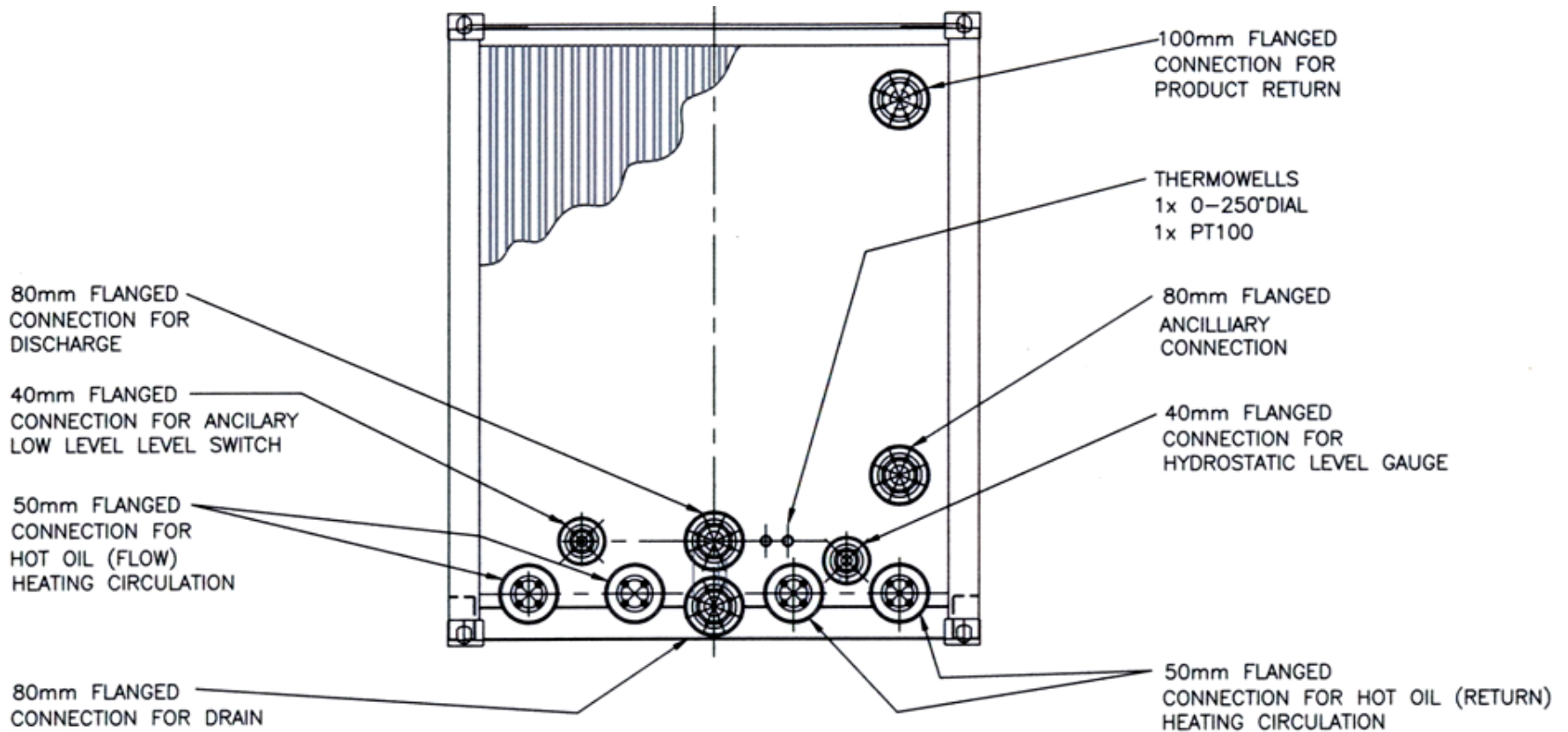
60Mt Storage Bitutainer™



Front end connection points



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Rear connection points



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Pipework and Control System Installations

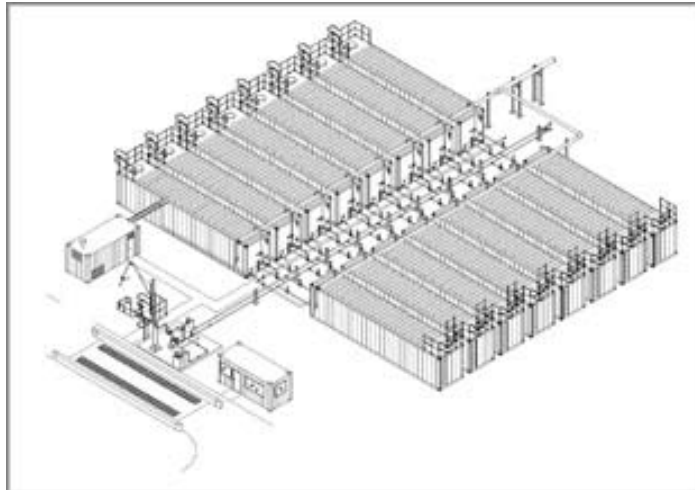


Civil, Mechanical and Electrical Disciplines



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Storage & Product Transfer Facilities using 40ft Storage Bitutainers™



Full Design, Civil, Mechanical and Electrical Assistance



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Head Office

**Hill Brow, Mill Lane,
High Salvington, Worthing,
West Sussex, BN13 3DE, UK.**

Tel: +44 (0)1903 830033 Fax: +44 (0)1903 830044

E-mail: info@tecint.co.uk Web: www.tecint.co.uk