

ENGINEERING CASE STUDY
Freightquip Pty Ltd

1. INTRODUCTION

Silent operation, minimal operating and maintenance costs are the key positive attributes to this clean and green machine.

A prototype 48' ISO Shipping container was specifically constructed as a prototype test bed for the research and development of a solar power container for use in interstate rail transport of perishable goods. The container is designed to maintain the cargo compartment at a steady +15°C regardless of external conditions.

Summer temperatures are reliably in excess of 50°C under a constant, unrepentent sun.



Roof mounted Solar Array



Front of the Container with external unit and battery pack

2. PROCESS DESCRIPTION

An array of solar cells are located within a roof cavity and provide up to 160 Amps of power to a series of batteries located in a front compartment of the container. The container also includes the power regulator and DC monitoring system.

Cooling is provided by a dc powered reciprocating compressor using R134A as the refrigerant. Twin, speed controlled DC condenser fans draw air over an oversized, air cooled condenser to maintain the optimum condensing condition. A minimum condition is required to ensure the proper feeding of control valves whilst to high a condition results in energy inefficiencies.

The evaporator section uses a natural circulation, extended surface module and requires nil power to operate.

Condensate is captured at either end of the container length and drained to the outside by suitable traps with rubber ends.

The Container is current under going desert trials between Perth-Melbourne and the Adelaide-Darwin routes.



Salt Pan – At home in the desert heat