



TITLE: Icepack freezer: absorption cycle

Specification reference: E03/FZ02.1

Product verification protocol: E03/FZ02-VP.1

Date of origin: 02.08.2007

Date of last revision: Replaces PIS specification E3/FR4. Rev: 01.01.1998

Contents:

1. Scope:	2
2. Normative references:	2
3. Terms and definitions:	2
4. Requirements:	3
4.1 General:	3
4.2 Performance:	3
4.2.1 Operating temperature range:	3
4.2.2 Refrigeration cycle:	3
4.2.3 Icepack freezing capacity:	3
4.2.4 Temperature control:	3
4.2.5 Flame failure device (gas units)	3
4.2.6 Holdover time:	3
4.2.7 Lock:	3
4.2.8 Fuel quality:	4
4.2.9 Fuel consumption:	4
4.2.10 Corrosion resistance:	4
4.2.11 Thermometer:	4
4.2.12 Markings:	4
4.2.13 Vaccine storage advice:	4
4.3 Environmental requirements:	4
4.3.1 Ambient temperature range during transport and storage:	4
4.3.2 Ambient humidity range during transport, storage and use:	4
4.4 Physical characteristics:	4
4.4.1 Overall dimensions:	4
4.4.2 Weight:	4
4.5 Interface requirements:	4
4.6 Human factors:	4
4.6.1 Generally:	4
4.6.2 Control panel and thermometer:	5
4.7 Materials:	5
4.7.1 Refrigerant:	5
4.7.2 Thermal insulation foaming agents:	5
4.7.3 Other restricted materials:	5
4.8 Warranty:	5

4.9	Servicing provision:	5
4.10	Disposal and recycling:	5
4.11	Instructions:	5
4.12	Training:	6
4.13	Verification:	6
5.	Packaging:	6
6.	On-site installation:	6
7.	Product dossier:	6
8.	On-site maintenance:	7
9.	Change notification:	7
10.	Defect reporting:	7
	Annex 1 – Temperature zone symbol for freezers	8
	Annex 2 - R134a symbol	8
	Annex 3 – Kerosene quality	8

1. Scope:

This specification defines the requirements for absorption-cycle icepack freezers. Three temperature zone designations are described: **moderate zone**, **temperate zone** and **hot zone**. These units are not suitable for storing vaccine.

2. Normative references:

BS2869:2006: *Specification for fuel oils for agricultural, domestic and industrial engines and boilers*.

DIN 8985: 1983-05: *Testing the surfaces of installed refrigerators and freezers*.

EMAS: *European Union Eco-Management and Audit Scheme*.

ISO 9001: 2000: *Quality Management Systems – Requirements*.

ISO 14001: 2004: *Environmental management systems - Requirements with guidance for use*.

ISO/IEC 17025: 2000: *General requirements for the competence of testing and calibration laboratories*.

ISO 20282-1: 2006: *Ease of operation of everyday products - Part 1: Context of use and user characteristics*.

3. Terms and definitions:

Holdover time: The time in hours during which all points in the icepack freezing compartment of the freezer remain below -10°C, at the maximum ambient temperature of the temperature zone for which the appliance is rated, after the fuel supply has been disconnected.

Hot zone: Hot zone appliances must operate at a steady +43°C ambient temperature and over a +43°C/+25°C day/night cycling temperature range.

In writing: means communication by letter, fax or email.

Legal Manufacturer: The natural or legal person with responsibility for the design, manufacture, packaging and labelling of a product or device before it is placed on the market under his own name, regardless of whether these operations are carried out by that person himself or on his behalf by a third party.

Moderate zone: Moderate zone appliances must operate at a steady +27°C ambient temperature and over a +27°C/+10°C day/night cycling temperature range.

Montreal Protocol: Montreal Protocol on Substances that Deplete the Ozone Layer.

Reseller: A commercial entity, licensed to act on behalf of a **Legal Manufacturer**, and which carries product liability and warranty responsibilities no less onerous than those carried by the Legal Manufacturer.

Temperate zone: Temperate zone appliances must operate at a steady +32°C ambient temperature and over a +32°C/+15°C day/night cycling temperature range.

4. Requirements:

4.1 General:

Absorption-cycle icepack freezers are used primarily in areas without a reliable electricity supply (i.e. less than 8 hours of continuous electricity per typical day). Manufacturers may offer products suitable for one or more temperature zones. Fuel supply is natural gas, propane or kerosene. Supplementary electric power is allowed but not required. These units are not suitable for storing vaccine.

4.2 Performance:

4.2.1 Operating temperature range:

As indicated on the temperature zone rating sticker attached to the product (see Annex 1).

4.2.2 Refrigeration cycle:

Absorption-cycle unit designed to operate on natural gas, propane or kerosene. Multi-fuelled products, including an electric-powered option are allowed but not required.

4.2.3 Icepack freezing capacity:

Not less than 2.4 kg of icepacks must be frozen per 24 hours. The freezer should accommodate a minimum of 8.4 kg of frozen icepacks.

4.2.4 Temperature control:

No specific requirement, subject to achieving the performance described in clause 4.2.3. The control system must be designed so that it cannot be adjusted by the user. A means for adjustment by a technician is acceptable provided the device is protected from user interference (e.g. by location within the appliance cabinet).

4.2.5 Flame failure device (gas units)

Natural gas and propane units must be fitted with an automatic flame failure device.

4.2.6 Holdover time:

No standard set; however performance data will be published.

4.2.7 Lock:

The door or lid must be fitted with a lock. Two keys are to be supplied with every unit.

- 4.2.8 *Fuel quality:*
If kerosene is used see Annex 3 for recommended fuel quality.
- 4.2.9 *Fuel consumption:*
No standard set; however performance data will be published.
- 4.2.10 *Corrosion resistance:*
Internal and external cabinet, lid and frame protected against corrosion to DIN 8985.
- 4.2.11 *Thermometer:*
Externally readable cabinet-mounted gas or vapour pressure dial thermometer.
- 4.2.12 *Markings:*
The freezer cabinet must be permanently marked with the chemical name of the refrigerant, or with the refrigerant number, formula or proportion (for blended refrigerants). In particular, products operating on R134a refrigerant must be marked with the blue identifying symbol shown in Annex 2.
- 4.2.13 *Vaccine storage advice:*
All units must carry a factory-fitted non-removable label, designed to last the lifetime of the appliance, carrying the words: '*Do not store vaccine in this freezer*' in letters a minimum of 20mm high. The label should be fixed to the lid of chest freezers and near the top of the door on upright freezers. The wording should be in one of the languages specified in clause 4.1.1, as indicated by the purchaser at the time of ordering.
- 4.3 *Environmental requirements:*
- 4.3.1 *Ambient temperature range during transport and storage:*
-30°C to +55°C when the product is inactivated.
- 4.3.2 *Ambient humidity range during transport, storage and use:*
5% to 95% RH.
- 4.4 *Physical characteristics:*
- 4.4.1 *Overall dimensions:*
To allow for manoeuvring through corners, corridors and doorways, the minimum dimension of the product (either length, width or height) should not exceed 830mm, and preferably it should not exceed 710mm. The maximum dimension must not exceed 1700mm and the maximum diagonal (corner to corner) dimension must not exceed 1850mm.
- 4.4.2 *Weight:*
Not critical.
- 4.5 *Interface requirements:*
None
- 4.6 *Human factors:*
- 4.6.1 *Generally:*
The product must be useable by the widest practicable range of active health workers, regardless of age, gender, size or minor disability, including long-sighted

- people without glasses, in accordance with the general principles laid out in ISO 20282-1: 2006.
- 4.6.2 *Control panel and thermometer:*
The control panel must be positioned on the front of the unit. The thermostat and thermometer dial must be positioned at the front of the unit and as close to eye level as possible within the constraints of the cabinet design. The gas isolating valve/kerosene burner control knob must be easily accessible to the operator without need to move the unit.
- 4.7 *Materials:*
- 4.7.1 *Refrigerant:*
HFC (hydro fluorocarbon) or HC (hydrocarbon) refrigerant. CFC (chlorofluorocarbon) and HCFC (hydrochlorofluorocarbon) gases are not acceptable. The suitability of alternative refrigerant gases will continue to be assessed.
- 4.7.2 *Thermal insulation foaming agents:*
Any gas complying with the limitations and deadlines set by the [Montreal Protocol](#) on the elimination of ozone-depleting chemicals.
- 4.7.3 *Other restricted materials:*
The product and its constituent components must not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated biphenyl ethers (PBDE).
- 4.8 *Warranty:*
The product is to be covered by a two year replacement warranty in the event of any component failure arising from defective design, materials or workmanship.
- 4.9 *Servicing provision:*
The product is to be designed to achieve a maintenance-free life of not less than 10 years apart from re-fueling, wick replacement and trimming (kerosene units), flue cleaning, routine de-frosting and cleaning.
- 4.10 *Disposal and recycling:*
The manufacturer is to provide information to the buyer on the hazardous materials contained within the system and suggestions for resource recovery/recycling and/or environmentally safe disposal.
- 4.11 *Instructions:*
User and maintenance instructions in Arabic, English, French, Mandarin Chinese, Russian and Spanish. The instructions are to be written for users and repair technicians and are to cover the following topics:
- installation procedures;
 - temperature adjustments (if applicable);
 - simple daily, weekly and monthly maintenance tasks;
 - periodic preventative maintenance checks;
 - diagnostic and repair procedures;

- itemized list of spare parts including part numbers;
- end-of-life resource recovery and recycling procedures.

4.12 Training:
Not required.

4.13 Verification:
In accordance with PQS Verification Protocol **E03/FZ02-VP**.

5. Packaging:

Materials used for packaging the finished product are to be free of ozone-depleting compounds as defined in the [Montreal Protocol](#). The general specification of shipping containers will be subject to agreement with the individual procurement agencies.

6. On-site installation:

Not required.

7. Product dossier:

The [legal manufacturer](#) or [reseller](#) is to provide WHO with a pre-qualification dossier containing the following:

- Dossier examination fee in US dollars.
- General information about the [legal manufacturer](#), including name and address.
- Unique identification reference for the product type.
- Brand name of the product.
- Full specifications of the product being offered, covering all the requirements set out in this document, including details of product marking and traceability.
- A comprehensive set of photographs showing all external surfaces of the unit, the interior layout, the compressor and a close-up of the thermometer, the thermostat and the burner controls.
- Certified photocopies of all type-approvals obtained for the product, including CE marking and the like.
- Certified photocopies of the legal manufacturer's ISO 9001: 2000 or more recent quality system certification. Note: Companies that are not ISO 9001-certified will be granted a period of 18 months following the date of publication of this document in which to achieve certification.
- Where relevant, certified photocopies of the [legal manufacturer's](#) ISO 14001:2004 certification, EMAS registration or registration with an equivalent environmental audit scheme. Conformity with an environmental audit scheme is not mandatory; however preference will be given to manufacturers who are able to demonstrate compliance with good environmental practice.
- Where available, laboratory test report(s) proving conformity with the product specifications.
- Indicative cost of the product per unit, per 10 units and per 100 units, EXW (Incoterms 2000).

8. On-site maintenance:

Maintenance will be carried out by the end-user and/or his agents.

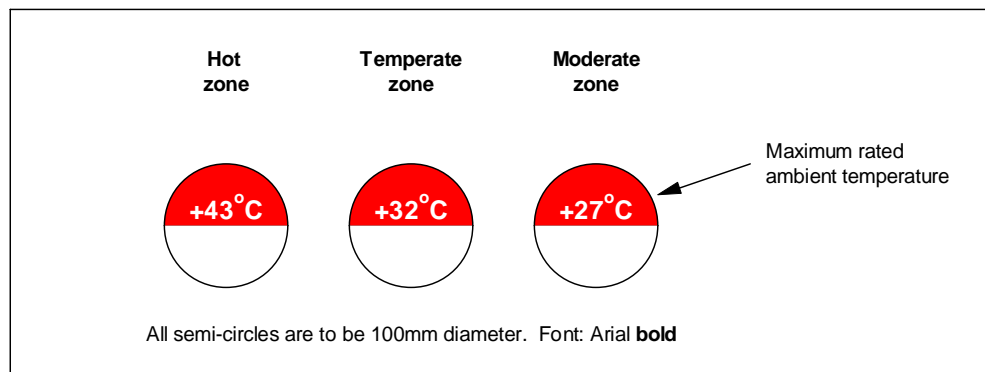
9. Change notification:

The [legal manufacturer](#) or [reseller](#) is to advise WHO [in writing](#) of any changes which adversely affect the performance of the product after PQS pre-qualification has taken place. Any change that WHO considers would alter the test results obtained against the PQS verification protocol **E03/FZ02-VP** will result in a request for the product to be retested.

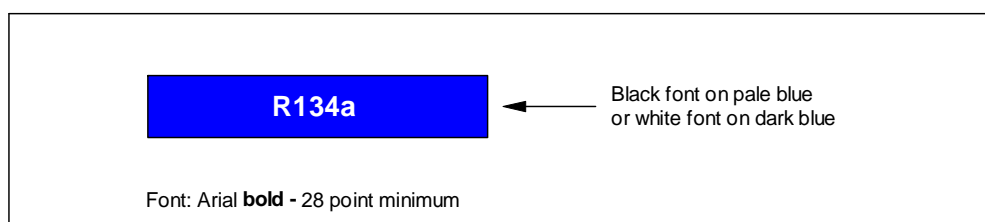
10. Defect reporting:

The [legal manufacturer](#) or [reseller](#) is to advise WHO and the UN purchasing agencies [in writing](#) in the event of safety-related product recalls, component defects and other similar events. If requested to do so by WHO/UNICEF, the manufacturer is to submit a report to WHO/UNICEF stating the number of affected systems and the number of component repairs/replacements provided, together with copies of any associated field reports.

Annex 1 – Temperature zone symbol for freezers



Annex 2 - R134a symbol



Annex 3 – Kerosene quality

The quality of kerosene recommended for wick burning stoves and refrigerators should have the following characteristics:

Minimum smoke point:	35 mm
Maximum char value:	10 mg/kg
Distillation: maximum % recovery at 200°C:	60%
Flock test:	Negative
Maximum sulphur content:	0.04%

Note: Specification details for kerosene to BS2869, Class C1 have been altered in the current 2006 version of the standard. After consultation with industry, and to reflect field conditions in the developing world, the standard set out in the 1998 PIS Annex 6 has been retained as the minimum required. Kerosene to this old standard should be used for testing appliances.

Revision history:			
Date	Change summary	Reason for change	Approved
23.05.2007	General edit with additional clauses plus Annexes 1, 2 and 3.	Final revisions to PQS format.	UK
31.05.2007	SMc comments incorporated. 4.2.4: Temperature control method clarified.		UK
02.08.2007	4.2.7: Lock spec changed. 4.4.1: Dims clarified. Annex 3 wording changed back to 1998 PIS wording. Clarification note added	In response to comments from manufacturers.	UK