



# E007

## Cold Chain Accessories

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The products in this category include miscellaneous cold chain accessories. IMD-PQS specifications for single-phase and three-phase voltage stabilizers and energy harvest systems have now been published and manufacturers have been invited to submit products for prequalification.

Details regarding the products included in each sub-category of E007, as well as guidelines, performance specifications and verification protocols for this category, can be accessed through the drop-down sections below.

### **E007.1: Voltage stabilizers for refrigerators and freezers**

Fluctuations in the voltage and frequency of mains supply power can cause serious damage to refrigerators, freezers and other powered appliances and devices. Frequent episodes of under- and overvoltage can compromise the functioning of critical refrigerator components like the compressor, electronic controls and thermostat.

To protect such appliances from damage, voltage stabilizers are used to reduce and correct fluctuations of input voltage and frequency and to thereby ensure a stable, safe electricity supply for refrigerators and freezers.

WHO requires every mains-powered refrigerator and freezer to be provided with either an integrated or a standalone voltage stabilizer. Single-phase voltage stabilizers must be prequalified to [WHO IMD-PQS specification E007/VS01.6](#) or latest version. Three-phase voltage stabilizers must be prequalified to [WHO IMD-PQS specification E007/VS02.1](#) or latest version.

#### ***E007.1.1: Voltage stabilizer types***

There are several different types of technology for automatic voltage stabilization, with the most common being electromechanical for small single-phase appliances, and three-phase voltage stabilizers for Walk-in Cold/Freezer Rooms.

Tap-changing voltage stabilizers are commonly used and suitable for refrigeration equipment. Two common types of tap-changing technology are relay-based and servo-based voltage stabilization. Solid state relay-based tap changing technology has no moving parts

and uses switching relays and a transformer to correct input voltage. Servo-based devices use motors to change the taps on the transformer to correct the voltage.

Given relay-based devices have no moving parts, they are less subject to mechanical breakdown and may require less maintenance compared to servo-based devices. However, servo-based devices have benefits over relay-based devices, including higher correction speed, higher precision of output voltage and greater ability to withstand inrush currents.

For single-phase devices, the simplest arrangement is to supply one single-outlet unit with each appliance. NEVER use an adaptor to connect more than one appliance to a regulator's electrical outlet and never use an adaptor to connect more than one regulator to a wall socket. Under IMD-PQS, all models are prequalified for powering both compression and absorption types of equipment.

For three-phase stabilizers, the device may be configured for star or delta connections in various different national grid utility tensions in countries.

Any associated electronic temperature monitoring equipment and computers should, ideally, be connected to a separate voltage-regulated circuit; this type of equipment is particularly sensitive to voltage fluctuations and to lightning-induced power spikes.

## **E007.2: Solar direct drive surplus energy harvest controls**

Energy harvest is a new technology that provides a limited amount of electricity to health facilities where there is unreliable electricity (weak-grid) or no electrical service (off-grid). Weak-grid facilities may use energy harvest as a backup power system for lights, communications and more. Off-grid facilities may use energy harvest as their only sure source of electricity.

During the course of most days, solar direct drive (SDD) vaccine refrigerators and/or water-pack freezers (i.e. appliances) cannot consume all the solar electricity available. That excess solar electricity is wasted unless it can either be captured and used immediately, or stored for later use. Energy harvesting was developed to capture this excess energy. This technology now enables facilities to power fans directly, recharge batteries in cell phones and lights and store power for nights in separate batteries that can be used in many ways, including equipment monitoring systems (EMS) and select medical devices.

Energy harvesting is an option only with some SDD appliances. In order to be granted IMD-PQS prequalified status, an Energy Harvest Control device (EHC) must be coupled to a specific IMD-PQS prequalified SDD, and the combination of EHC-SDD must then also pass laboratory tests and field evaluation. Four general types of EHC systems are currently available: (1) a standalone "kit" including some electrical devices (e.g. a battery, cabling, lights and other electrical consuming load devices); (2) basic "integrated" functionality (i.e. users to provide plug-in devices for USB, 12 Volt or other loads); or (3) "custom" where the surplus electricity can be directed for other uses (e.g. 12-volt battery recharging to power user supplied 5 vdc and 12 vdc loads or an inverter to power limited 120/220 vac user

supplier loads, or (4) "basic USB" which is strictly limited to a 1A 5 vdc (maximum of 5W) USB-A port integrated into the appliance. Energy production from the EHC can be as little as 5 to 60 Wh/day for a "Basic USB" EHC, to over 500 WH/day for a "kit" or "custom" EHC. All types must be tested and prequalified. However, only "kits" will be identified with an IMD-PQS code number. IMD-PQS does not lab-test load devices like lights, fans, other peripheral optional items or customized systems (e.g. inverters, medical equipment).

Additional information is provided in the "Comments" section of the relevant SDD product data sheet(s). Product data sheets can be found in the IMD-PQS Catalogue section E003: Refrigerators and freezers.

Furthermore, it is technically possible to increase the energy harvest (Wh/days) both with more efficient harvest of single compressor appliances, harvest from dual compressor appliances as well as multiple SDD + EHC harvesting in parallel (e.g. to charge a larger battery or run other motors).

### **E007.3: Refrigerator and freezer spare parts and kits**

Refrigerator and freezer spare parts are listed in the IMD-PQS Catalogue on the same page of each relevant prequalified appliance.

## **CATEGORY DOCUMENTATION, GUIDANCE FOR MANUFACTURERS/SUPPLIERS & SUPPORTING INFORMATION FOR USERS**

### **Performance specifications**

[PQS performance specification E007/EHC01.1: Solar direct drive surplus energy harvest control](#)

[PQS performance specification E007/EHC02.1: Solar Direct Drive Basic Energy Harvest Control devices](#)

[PQS performance specification E007/VS01.6: Single-phase voltage stabilizer for AC-powered refrigerators and freezers](#)

[PQS performance specification E007/VS02.1: Three-phase voltage stabilizer for AC powered Walk-In Cold & Freezer Rooms](#)

### **Verification protocols**

[PQS Self-testing verification protocol E007/VS02-VP.1: Three-Phase Voltage Stabilizers for AC powered Walk-In Cold and Freezer Rooms](#)

[PQS independent type-testing protocol E007/VS01-VP.6: Single-phase voltage stabilizer for AC-powered refrigerators and freezers](#)

[PQS independent type-testing protocol E007/EHC02-VP.2: Solar Direct Drive Basic Energy Harvest Control devices](#)

[PQS independent type-testing protocol E007/EHC01-VP.1: Solar direct drive surplus energy harvest control devices](#)

### **Guidance for manufacturers or suppliers**

[IMD-PQS Guidelines for Prequalification Holders](#)

[Generic guide for the field evaluation of new technologies for WHO PQS prequalification  
GENERIC/GUIDE 1.1](#)

### **Supporting information for users**

[Solarization: Access to modern energy services for health facilities in resource-constrained settings](#)



## E007 VS: Cold chain accessories



<b>Product name:</b>	SVS04E-22
<b>IMD-PQS Code:</b>	E007-004
<b>Status:</b>	Prequalified
<b>Date of acceptance:</b>	23 May 2019
<b>Appliance type:</b>	E007
<b>Product description:</b>	Single Phase Voltage Stabiliser - Extended Range
<b>Manufacturer:</b>	Sollatek (UK) Limited
<b>Manufacturers Reference:</b>	SVS04E-22
<b>Country of Manufacture:</b>	United Kingdom
<b>Address:</b>	Sollatek House, Waterside Drive, Langley SL3 6EZ, United Kingdom United Kingdom of Great Britain and Northern Ireland
<b>Telephone:</b>	+441753214500
<b>Email:</b>	<a href="mailto:maan.allos@sollatek.com">maan.allos@sollatek.com</a>
<b>Website address:</b>	<a href="http://www.sollatek.com">www.sollatek.com</a>
<b>Valid until:</b>	31 May 2026

## Specifications

### PRODUCT SPECIFICATIONS - ADDITIONAL

<b>Nominal Input Frequency (Hz)</b>	60.00	<b>Nominal Input Voltage (V)</b>	155.00
<b>Nominal Output Frequency (Hz)</b>	60.00	<b>Nominal Output Voltage (V)</b>	285.00
<b>Power Rating (kVA)</b>	1.00	<b>CE marking</b>	Yes

### QUALITY STANDARD

<b>Specification Reference</b>	Applicable PQS specification: E007/VS01.5 Applicable PQS VP(s): E007/VS01_VP.5
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### PRODUCT SITES

<b>Organization name</b>	Sollatek (UK) Limited
<b>Address</b>	Sollatek House, Waterside Drive, Langley SL3 6EZ, United Kingdom United Kingdom of Great Britain and Northern Ireland

<b>Current PQS status:</b>	<i>Prequalified</i>	<b>Valid until:</b>	<i>31 May 2026</i>
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Note: If Current PQS status is 'Suspended' or 'Withdrawn', this product is NOT to be purchased.



## E007 VS: Cold chain accessories



<b>Product name:</b>	<b>HVS-1000</b>
<b>IMD-PQS Code:</b>	E007-005
<b>Status:</b>	Prequalified
<b>Date of acceptance:</b>	11 May 2019
<b>Appliance type:</b>	E007
<b>Product description:</b>	Single Phase Voltage Stabiliser
<b>Manufacturer:</b>	Qingdao Haier Biomedical Co., Ltd
<b>Manufacturers Reference:</b>	HVS-1000
<b>Country of Manufacture:</b>	China
<b>Address:</b>	No.280 Fengyuan Road High-tech Zone Qingdao Shandong China
<b>Telephone:</b>	+86-15066227057
<b>Email:</b>	<a href="mailto:tianhui.yu@haierbiomedical.com">tianhui.yu@haierbiomedical.com</a>
<b>Website address:</b>	<a href="http://www.haiermedical.com">http://www.haiermedical.com</a>
<b>Valid until:</b>	31 May 2026

## Specifications

### PRODUCT SPECIFICATIONS - ADDITIONAL

<b>Nominal Input Frequency (Hz)</b>	60.00	<b>Nominal Input Voltage (V)</b>	230.00
<b>Mode of operation</b>	Other	<b>Mode of operation (Other)</b>	Servo-Induction Mechanical tap-changing
<b>CE marking</b>	Yes		

### PRICE AND SHIPPING

<b>Price</b>	70 USD	<b>Year of base price</b>	2021
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### QUALITY STANDARD

<b>Specification Reference</b>	Applicable PQS specification: PQS/E007/VS01.5 Applicable PQS VP(s): E007/VS01-VP.5
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### PRODUCT SITES

<b>Organization name</b>	Qingdao Haier Biomedical Co., Ltd
<b>Address</b>	No.280 Fengyuan Road High-tech Zone Qingdao Shandong China

<b>Current PQS status:</b>	<i>Prequalified</i>	<b>Valid until:</b>	<i>31 May 2026</i>
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Note: If Current PQS status is 'Suspended' or 'Withdrawn', this product is NOT to be purchased.



## E007 VS: Cold chain accessories



<b>Product name:</b>	<b>WHT-230ER</b>
<b>IMD-PQS Code:</b>	E007-007
<b>Status:</b>	Prequalified
<b>Date of acceptance:</b>	26 Apr 2022
<b>Appliance type:</b>	E007
<b>Product description:</b>	Single Phase Voltage Stabiliser - Extended Range
<b>Manufacturer:</b>	SAGAR ELECTRICALS
<b>Manufacturers Reference:</b>	WHT-230ER
<b>Country of Manufacture:</b>	India
<b>Address:</b>	14A Industrial Estate, Jagadhri Road, Ambala Cantt, Haryana 133001, India
<b>Telephone:</b>	+91 171 2699445
<b>Email:</b>	<a href="mailto:nkthapar@electrogard.com">nkthapar@electrogard.com</a>
<b>Website address:</b>	<a href="http://www.electrogard.com">www.electrogard.com</a>
<b>Valid until:</b>	31 May 2026

## Specifications

### PRODUCT SPECIFICATIONS - ADDITIONAL

<b>Nominal Input Frequency (Hz)</b>	50.00	<b>Nominal Input Voltage (V)</b>	230.00
<b>Nominal Output Frequency (Hz)</b>	50.00	<b>Nominal Output Voltage (V)</b>	230.00
<b>Input frequency regulation range (Hz)</b>	50-60	<b>Input Voltage Regulation Range (V)</b>	110-274
<b>Output Current (A)</b>	4.40	<b>Short Circuit Protection Type</b>	MCB Type C
<b>Overload Protection Type</b>	CT actuated electronic shut-down with auto reset after 3-6 minutes	<b>Overvoltage Endurance Electrical Withstand (V)</b>	415.00
<b>Impulsive Transient Protection (kA)</b>	8.00	<b>Power Rating (kVA)</b>	1.00
<b>Ingress protection rating IP</b>	IP21	<b>Maximum Rated Ambient Temp (°C)</b>	43.00
<b>Minimum Rated Ambient Temp (°C)</b>	-5.00	<b>External dimensions height (mm)</b>	129.00
<b>External dimensions length (mm)</b>	325.00	<b>External dimensions width (mm)</b>	238.00
<b>Power Lead Length (m)</b>	1.50	<b>Mode of operation</b>	Other
<b>Mode of operation (Other)</b>	Servo-Induction Mechanical tap-changing	<b>Control Panel Display</b>	Indicators for Mains Present :RED & Output Present: Green
<b>Display medium</b>	LED	<b>CE marking</b>	Yes
<b>Efficiency Percentage (%)</b>	0.90	<b>Relative Humidity Rating (%)</b>	0.95
<b>Comments</b>	Input frequency regulation range (Hz): 50-60Hz Input_voltage_regulation_range_v: 110-274 V Output_voltage_accuracy_pct: 230V +10% or -15%		

### PRICE AND SHIPPING

<b>Shipping weight (kg)</b>	9.50
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### QUALITY STANDARD

<b>Specification Reference</b>	Applicable PQS specification: E007/VS01.5 Applicable PQS VP(s): E007/VS01-VP.5
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### PRODUCT SITES

<b>Organization name</b>	SAGAR ELECTRICALS
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<b>Address</b>	14A Industrial Estate, Jagadhri Road, Ambala Cantt, Haryana 133001, India India
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<b>Current PQS status:</b>	<i>Prequalified</i>	<b>Valid until:</b>	<i>31 May 2026</i>
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Note: If Current PQS status is 'Suspended' or 'Withdrawn', this product is NOT to be purchased.





## E007 VS: Cold chain accessories



<b>Product name:</b>	PPS MFS-100Lw
<b>IMD-PQS Code:</b>	E007-008
<b>Status:</b>	Prequalified
<b>Date of acceptance:</b>	17 Feb 2023
<b>Appliance type:</b>	E007
<b>Product description:</b>	Voltage Stabiliser (Integrated)
<b>Manufacturer:</b>	Thyratron Electronic Applications SA
<b>Manufacturers Reference:</b>	PPS MFS-100Lw
<b>Country of Manufacture:</b>	Greece
<b>Address:</b>	Kydonies, Erymanthos, Achaia 25008 Patra Greece
<b>Telephone:</b>	+30 2694 062 010
<b>Email:</b>	<a href="mailto:christos@thyatron.gr">christos@thyatron.gr</a>
<b>Website address:</b>	<a href="https://www.thyatron.gr">https://www.thyatron.gr</a>
<b>Valid until:</b>	31 May 2026

## Specifications

### PRODUCT SPECIFICATIONS - ADDITIONAL

<b>Nominal Input Frequency (Hz)</b>	60.00	<b>Nominal Input Voltage (V)</b>	230.00
<b>Nominal Output Frequency (Hz)</b>	60.00	<b>Nominal Output Voltage (V)</b>	230.00
<b>Output Current (A)</b>	3.20	<b>Power Rating (kVA)</b>	0.73
<b>Mode of operation</b>	Other	<b>Mode of operation (Other)</b>	Servo-Induction Mechanical tap-changing
<b>CE marking</b>	Yes		

<b>Comments</b>	Shipping Volume: ECU: 36 pcs/Carton, Transformers: 6 pcs/Carton Shipping Weight: ECU: 7Kg/carton, Transformers: 25Kg/Carton Input_voltage_regulation_range_v: 110-285 V
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### PRICE AND SHIPPING

<b>Price</b>	70 USD	<b>Year of base price</b>	2025
<b>Incoterms</b>	EXW		

### QUALITY STANDARD

<b>Quality Standard</b>	Other	<b>Quality standard (Other)</b>	ISO9001:2015; ISO14001:2015
<b>Specification Reference</b>	WHO/PQS/E007/VS01.5		

### VERIFICATION

<b>Verification Laboratory</b>	Labor SA	<b>Address</b>	Ethnikis Antistaseos 84, Pallini, P.C. 15351, GreeceGreece
<b>Telephone</b>	+30 2106033377	<b>Email</b>	labor@labor.gr
<b>Verification Report Reference</b>	VoC 0565.006.3.02		

### PRODUCT SITES

<b>Organization name</b>	Thyratron Electronic Applications SA
<b>Address</b>	Kydonies, Erymanthos, Achaia 25008 Patra Greece

<b>Current PQS status:</b>	Prequalified	<b>Valid until:</b>	31 May 2026
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Note: If Current PQS status is 'Suspended' or 'Withdrawn', this product is NOT to be purchased.



## E007 VS: Cold chain accessories



<b>Product name:</b>	HSV1000U
<b>IMD-PQS Code:</b>	E007-009
<b>Status:</b>	Prequalified
<b>Date of acceptance:</b>	24 Oct 2023
<b>Product description:</b>	Voltage Stabiliser
<b>Manufacturer:</b>	Qingdao Haier Biomedical Co., Ltd
<b>Manufacturers Reference:</b>	HSV1000U
<b>Country of Manufacture:</b>	China
<b>Address:</b>	No.280 Fengyuan Road High-tech Zone Qingdao Shandong China
<b>Telephone:</b>	+86-15066227057
<b>Email:</b>	<a href="mailto:tianhui.yu@haierbiomedical.com">tianhui.yu@haierbiomedical.com</a>
<b>Website address:</b>	<a href="http://www.haiermedical.com">http://www.haiermedical.com</a>
<b>Valid until:</b>	31 May 2026

## Specifications

### PRODUCT SPECIFICATIONS - ADDITIONAL

<b>Nominal Input Voltage (V)</b>	230.00	<b>Nominal Output Voltage (V)</b>	230.00
<b>Input frequency regulation range (Hz)</b>	47-63	<b>Input Voltage Regulation Range (V)</b>	110-264
<b>Output Current (A)</b>	4.40	<b>Output Voltage Accuracy (%)</b>	10.00
<b>Impulsive Transient Protection (kA)</b>	4.00	<b>Power Rating (kVA)</b>	1000.00
<b>Ingress protection rating IP</b>	IP31	<b>Maximum Rated Ambient Temp (°C)</b>	45.00
<b>Minimum Rated Ambient Temp (°C)</b>	-15.00	<b>External dimensions height (mm)</b>	20.00
<b>External dimensions length (mm)</b>	34.00	<b>External dimensions width (mm)</b>	15.00
<b>Power Lead Length (m)</b>	1.70	<b>CE marking</b>	Yes
<b>Efficiency Percentage (%)</b>	100.00	<b>Relative Humidity Rating (%)</b>	95.00

<b>Comments</b>	Nominal input frequency: 50-60 Hz Nominal output frequency: 47-63 Hz Overvoltage_endurance_Electrical_withstand: 60-500 V
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### PRICE AND SHIPPING

<b>Shipping volume (m3)</b>	0.01	<b>Weight per Package (Kg)</b>	12.0000
<b>Minimum order</b>	5.00	<b>Units per package</b>	1.00
<b>Price</b>	240	<b>Year of base price</b>	2023
<b>Incoterms</b>	EXW		

### QUALITY STANDARD

<b>Quality Standard</b>	ISO 13485;Other	<b>Quality standard (Other)</b>	ISO 9001
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### VERIFICATION

<b>Verification Laboratory</b>	CHEARI	<b>Address</b>	#29 Xia Jie Street, Xuan Wu district Beijing 100053 R. P. de ChineChina
<b>Telephone</b>	+86 1063162443	<b>Email</b>	<a href="mailto:gongcx@cheari.com">gongcx@cheari.com</a>
<b>Current PQS status:</b>	Prequalified	<b>Valid until:</b>	31 May 2026

Note: If Current PQS status is 'Suspended' or 'Withdrawn', this product is NOT to be purchased.



## E007 VS: Cold chain accessories



Product name:	PPS_MFS-100Lw [v1.6]
IMD-PQS Code:	E007-010
Status:	Prequalified
Date of acceptance:	14 Jun 2024
Product description:	Voltage Stabiliser (Integrated)
Manufacturer:	Thyratron Electronic Applications SA
Manufacturers Reference:	PPS_MFS-100Lw [v1.6]
Country of Manufacture:	Greece
Address:	Kydonies, Erymanthos, Achaia 25008 Patra Greece
Telephone:	+30 2694 062 010
Email:	<a href="mailto:christos@thyatron.gr">christos@thyatron.gr</a>
Website address:	<a href="https://www.thyatron.gr">https://www.thyatron.gr</a>
Valid until:	31 May 2026

## Specifications

### PRODUCT SPECIFICATIONS - MAIN

Power Input (W)	0.73
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### PRODUCT SPECIFICATIONS - ADDITIONAL

Nominal Input Voltage (V)	230.00	Nominal Output Voltage (V)	230.00
Input frequency regulation range (Hz)	47-63	Input Voltage Regulation Range (V)	110-285
Output Current (A)	3.20	Short Circuit Protection Type	Internal
Overload Protection Type	Internal	Impulsive Transient Protection (kA)	10.00
Power Rating (kVA)	73.00	Ingress protection rating IP	4X
Maximum Rated Ambient Temp (°C)	43.00	Minimum Rated Ambient Temp (°C)	-5.00
Mode of operation	Other	Mode of operation (Other)	AC to AC voltage stabilizer
CE marking	Yes		

Comments	Shipping Volume: ECU: 36 pcs/Carton, Transformers: 6 pcs/Carton Shipping Weight: ECU: 11Kg/carton, Transformers: 25Kg/Carton Output Voltage Accuracy (%): +10% or -15% Nominal Input Frequency (Hz): 50 or 60 Hz Nominal Output Frequency (Hz): 50 - 60 Hz Relative Humidity Rating (%): 5 - 95% RH, non-condensing Weight per Unit (Kg): 0.270Kg ECUs, 3.970Kg Transformer, Total 4.240Kg Units per package 36 ECUs/carton, 6 Transformers/carton OverVolt.EnduranceElectricalWithstand(V): 60 - 500VAC Weight per Package (Kg): 10.5kg ECUs(36qty)/carton, 24.5kg Transformers(6qty)/carton External dimensions height (mm) 32.5mm/ECU, 131mm/Transformer External dimensions length (mm) 121mm/ECU, 94.5mm/Transformer External dimensions width (mm) 114mm/ECU, 108.5mm/Transformer
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### PRICE AND SHIPPING

Minimum order	1.00	Price	90 \$US
Year of base price	2025	Incoterms	EXW

### QUALITY STANDARD

Quality Standard	Other	Quality standard (Other)	ISO9001:2015; ISO14001:2015
Specification Reference	WHO/PQS/E007/VS01.6		

### VERIFICATION

Verification Laboratory	Labor SA	Address	Ethnikis Antistaseos 84, Pallini, P.C. 15351, GreeceGreece
Telephone	+30 2106033377	Email	labor@labor.gr
Verification Report Reference	VoC 0565.011.3.05		

**Current PQS status:**

*Prequalified*

**Valid until:**

*31 May 2026*

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Note: If Current PQS status is 'Suspended' or 'Withdrawn', this product is NOT to be purchased.