

## **Instruction Manual**

# **PULL-OFF TESTER**

## **Product Code**

# E142 / E142-01

Do not attempt to operate this equipment before reading and comprehending the manual in all its parts



# **Users**

MACHINE MANUFACTURERS	DRAUGHTSMEN	OPERATORS	MAINTENANCE WORKER	RS ANY OT	THERS
REV. DESCRIPTION I	MANAGED A	PPROVED	PRODUCT CODE	PAGES	ISSUE DATE

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01	Instruction Manual	EK	UTEC	E142.M01.EN.03	12	11/2022

REV.	DESCRIPTION	MANAGED	APPROVED	PRODUCT CODE	PAGES	ISSUE DATE
01	Instruction Manual	EK	UTEC	E142.M01.EN	2	11/2022

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## 1. GENERAL INFORMATION

#### 1.1 WARNINGS

The manufacturer does not accept any responsibility for direct or indirect damage to people, things or animals and use of the appliance in different conditions from those foreseen.

The manufacturer reserves the right to make changes to the documentary information or to the appliance without advance notice.

Check the machine responds to the standards in force in the state in which it has been installed.

All operations necessary for maintaining machine efficiency before and throughout use are the operator's responsibility. Carefully read the entire manual before operating the machine.

It is vital to know the information and limitations contained in this manual for correct machine use by the operator. Interventions are only permitted if the operator is accordingly competent and trained.

The operator must be knowledgeable about machine operations and mechanisms.

The purchaser must ensure that operators are trained and aware of all the information and clarifications in the supplied documentation. Even with such certainty the operator or user must be informed and therefore aware of potential risks when operating the machine. Safety, reliability and optimum performance is guaranteed when using original parts.

Any tampering or modifying of the appliance (electrical, mechanical or other) which has not been previously authorised in writing by the manufacturer is considered abusive and disclaims the constructor from any responsibility for any resulting damage. All necessary operations to maintain the efficiency of the machine before and throughout use are the responsibility of the user.

#### 1.2 WARNING AND DANGER INDICATIONS - SIGNS

The machine has been designed and constructed according to the current norms and consequently with mechanical and electrical safety devices designed to protect the operator or user from possible physical damage. Residual risks during use or in some intervention procedures on the device are however present. Such risks can be reduced by carefully following manual procedures, using the suggested individual protection devices and respecting the legal and safety norms in force.

This manual includes "Warning" and "Danger" indications in relevant chapters. These indications are shown with the words "Danger" or "Warning" in bold font and uppercase to make them highly visible.

0	WARNING	It indicates that machine damage could be caused should indications be ignored.
<u>•</u>	DANGER	It indicates that machine damage and/or injury to the worker could be caused should indications be ignored.

"DANGEROUS ZONE" indicates any zone inside or in the proximity on the appliance in which a person is exposed to the risk of injury of damage to health.

## 1.3 AIM OF THE INSTRUCTIONS MANUAL

This manual has been edited with the aim of providing all machine operators with all the necessary information on installation, use and maintenance from production to scrapping in as comprehensive and clear manner as possible.

All the procedures useful for any foreseeable emergency situations have been listed by the manufacturer and can be verified during use.

Operators, for whom this manual has been written, due to their competence must give instructions or operate the machine themselves.

The instructions manual must be carefully consulted by laboratory or site safety managers, equipment operators and any internal and external maintenance workers.

The manual is integral to the product and refers to this appliance only.

The manual must be safeguarded and always kept near the equipment so that it can be easily consulted whenever necessary.

**IMPORTANT**: The manual does not substitute the experience and technical training of the worker but must be considered a guide for carrying out its functions.

Furthermore, all the norms and rules the operator should be aware of or consult for correct use of the machine and/or test performance can be found in the manual.

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This responsibility is entrusted to the installer and Laboratory or Site Manager where the machine is installed.

The Constructor is available to provide further information.

#### 1.4 STRUCTURE OF THE INSTRUCTIONS MANUAL

The manual can consist of a number of documents, as shown in the appropriate list.

Verify that all documents are present; otherwise request the missing parts from the Constructor before using the machine. Instructions can be supplied with enclosures containing diagrams and designs, which are necessary for interpretation of correct machine use and maintenance.

#### 1.5 COMPOSITION OF THE INSTRUCTIONS MANUAL

Document Description	Document Code
Instructions manual	E142.M01.EN.03

## 1.6 MODIFICATIONS AND ENCLOSURES OF THE INSTRUCTIONS MANUAL

This manual reflects the state at the time of the launch of the machine on its market. If any modifications, improvements, or adjustments have been made since machine supply the Manufacturer does not have to intervene on the marketed machine and will not consider the machine or the manual deficient or inadequate.

### 1.7 CONSTRUCTOR IDENTIFICATION

See first page.

#### 1.8 MACHINE IDENTIFICATION DATA

See machine identification data on EC Declaration or behind the machine.

#### 1.9 EC STAMP

See EC Declaration

#### **1.10 USAGE**

This dynamometer measures the adhesive force and the tensile strength of two layers of materials (concrete, facing plasters, mortars, building plasters, lime etc.)

and is particularly suitable for applications concerning testing repairs of any structure where the bond strength between two layers is an essential factor.



This appliance is for the exclusive use which it has been conceived for. Any other use is considered improper and therefore negligent. Machine use is allowed only in places free from danger of explosion or fire. During operation check for conditions of danger. immediately stop the machine should it be working irregularly and consult the authorised dealer's Sales Service department. It is the Client's responsibility to verify at the time of installation and use that no conditions of use arise which are different to those indicated.

## 1.11 OPERATORS



The use, transportation, installation, maintenance, demolition and disposal of the appliance are only permitted to "QUALIFIED PERSONNEL". This manual is exclusively aimed at "QUALIFIED PERSONNEL" and contains the necessary information for machine use.

"QUALIFIED PERSONNEL" means people who, due to their training, experience and education, as well as knowledge of the relevant standards, limitations and measures, have been authorized by the "PLANT SAFETY MANAGER" to carry out any necessary activity and are able to recognise and avoid any possible danger. The manufacturer recommends that the instructions, procedures and recommendations in this manual and the work safety legislation in force be scrupulously adhered to, even with the use of appropriate protection devices (whether individual or part of the machine).

Knowledge and respect of the instructions, safety warnings and danger in this manual are all necessary for installation, operation, management and machine maintenance with a minimal risk.

The "PLANT SAFETY MANAGER" has the following responsibilities and duties:

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- To know the machine functions, its commands, safety and protection devices, possible dangers of use and all the information in this manual in detail. This knowledge can only be gleaned from detailed reading of this manual.
- To know the safety legislation in force in detail in order to operate the machine
- To recognize the "QUALIFIED PERSONNEL" for transportation, handling, installation, use, maintenance, disposal, etc.
- Correctly train and educate the "QUALIFIED PERSONNEL" before allowing them access to the machine. The personnel must also be exhaustively trained with regards to the machine's protection devices.
- Ensure the machine's safety devices are not tampered with or removed and are checked on a daily basis. Provide the operator appropriate individual protection devices according to the laws in force.
- The constructor is available for clarification, assistance and training and deceptions all responsibility for damage to things or people resulting from improper, incorrect and negligent use by untrained personnel.

#### 1.12 STORAGE



**WARNING** 

The appliance must be stored and conserved in the original packaging and in a closed environment, protected from atmospheric agents with a minimum temperature of -15C°, and a maximum of +60C° and a maximum humidity of 70%.

#### 1.13 TRASPORTATION AND MOVEMENT



DANGER WARNING In order to avoid irreparable machine damage, move with care, do not overturn, protect from rain, do not stack, protect the packaging and its contents from bumps and sources of heat.

During transportation and movement it is important to avoid bumps, overloading with other packages, exposure to freezing or heating atmospheric agents, or any other potentially harmful condition to the device, things or people. Machine transportation and movement must be entrusted to Qualified Personnel who can ensure correct movement



DANGER WARNING Do not transport or move the product should it be impossible to respect the conditions on the packaging or there be any doubts. Request information from the constructor

#### 1.14 PACKAGING REMOVAL



Supplied complete with carrying case.

After removing the packaging check the machine is complete and that there are no visibly damaged parts. DO NOT USE THE MACHINE and refer to the constructor when in doubt.



**DANGER** 

The components used for packaging (plastic bags, polystyrene, nails, screws, wood, etc) must be kept out of reach of children, as they are sources of danger. These components should be placed in the appropriate containers.

Before disposing of the packaging check all machine components such as accessories, utensils, instructions, documents etc have been removed.



**WARNING** 

In order to avoid bumps and overturn adopt the normal and logical precautions.

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# 2. TECHNICAL CHARACTERISTICS

# 2.1 GENERAL MACHINE DESCRIPTION

1	DIGITAL DISPLAY
2	UPPER HANDWHEEL
3	PISTON
4	PLATE
5	THREE LEGS
6	HYDRAULIC PUMP
7	ROUND COUNTER
8	HAND WHEEL FOR FORCE
	APPLICATION
9	TENSILE HEAD
10	ADHESION DISC (ACCESSORY
	TO BE ORDERED SEPARATELY)
11	TIE ROD WITH SPHERICAL HEAD
12	16 KN LOAD CELL

	E142	E142-01	
Load capacity	16 kN	5 kN	
Reading	0,00	1 kN	
resolution			
Accuracy	+/- 1%		
Range of load	0,25 kN -	0 kN –	
capacity	16 kN	5kN	
Permissible	4,5 mm		
stroke			

# **ACCESSORIES**

E142-10 SOFTWARE complete with connection cable to download test results to the PC

E143 ADHESION TEST ALUMINIUM DISC 20 mm Ø by 21 mm thick (n° 10 pieces)

E143-01 ADHESION TEST ALUMINIUM DISC 50 mm Ø by 31 mm thick (n° 10 pieces)

E143-10 ADHESION TEST STAINLESS STEEL DISC 50 mm Ø by 21 mm thick (n° 10 pieces) It conforms to EN 1015-12 Specification.

E143-13 ADHESION TEST ALUMINIUM DISC, square, 50x50 mm, 21 mm thick (n° 10 pieces)
Standard: EN 1348

E143-11 CYLINDRICAL RING, having truncated cone shape, inside Ø 50 mm
Standard: EN 1015-12

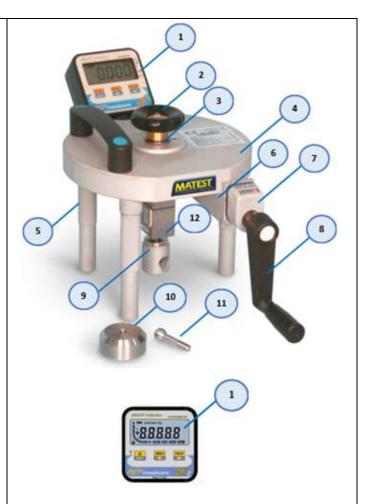
E143-02 DRILL BIT WITH CENTERING BIT, 20 mm diameter, for the preparation of the test surface.

E143-03 DRILL BIT WITH CENTERING BIT, 50 mm diameter, for the preparation of the test surface.

E143-12 ACRYLIC ADHESIVE GLUE, 300 ml. cartridge, complete with small pump and nozzles.

# SPARE

E143-09 Tie rod with spheric head for Disc/Dynamometer coupling.







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#### 2.2 DIMENSIONS AND WEIGHT

#### 2.2 POWER SUPPLY

Li-lon 1800mA/h 3.7V Batteries. Rechargeable from USB port (5Vdc) via supplied cable.

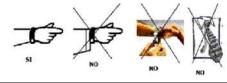
## 3. **GENERAL SAFETY STANDARDS**

#### 3.1 GENERAL STANDARDS

To ensure the safety of machine operators:

- Any tampering with the appliance not preemptively authorised by the manufacturer exempts the manufacturer from any responsibility for damage caused by or to it.
- The removal or tampering with safety devices entails a violation of the safety standards.
- Machine use is only allowed in areas where there is no risk of explosions or fires.
- Only the original fittings can be used. The use of unoriginal fittings exonerates the manufacturer from all responsibility.
- Check the appliance is in ideal working conditions and that its parts are not worn or faulty before Carry out all necessary maintenance
- Do not wear loose clothing, ties, chains, or anything else which could become caught in the frame or other moving parts of the appliance.
- Be aware of the danger of electrical shocks from direct or indirect contact due to unforeseen electrical faults.

- Do not subject the appliance to violent impact.
- Do not expose the appliance to fire, welding sparks or extreme temperatures.
- Do not bring the appliance into contact with corrosive substances.
- Do not wash the appliance with jets of water.
- Check the workspace around the machine is clear from potentially dangerous objects.
- The machine operator must wear appropriate work clothing such as protective glasses, gloves and mask in order to avoid damage from, for example, harmful dust projection. Wear a lower back support when lifting heavy parts. There should be no hanging objects such as bracelets or otherwise, long hair should be protected with relevant precautions, shoes must be appropriate for the type of operation to be carried out.



#### **DURING USE**

When operating check there are no conditions of danger. Immediately stop the machine when it is functioning irregularly. Contact the authorized Sales Service department.

For the operator's safety do not touch any part of the appliance when testing and use the appropriate individual protection devices in order to keep the operator safe.

RISK OR DANG	ER	PROTECTION DI	EVICES
FINGER SQUEEZE CUTS OR ABRASIONS		REINFORCED GLOVES	
MATERIAL FALL		ACCIDENT- PREVENTION SHOES	

#### 4. INSTALLATION INSTRUCTIONS

#### 4.1 LOCATION

The equipment must be placed in an ideal position and environment for the use it has been conceived for (laboratory use and protected from atmospheric agents) and that the machine is placed by a qualified operator.

# ALLOWED TEMPERATURE

From +5°C to +40°C

# ALLOWED RELATIVE HUMIDITY

from 30% to 70%

## **GENERAL ADVICE:**

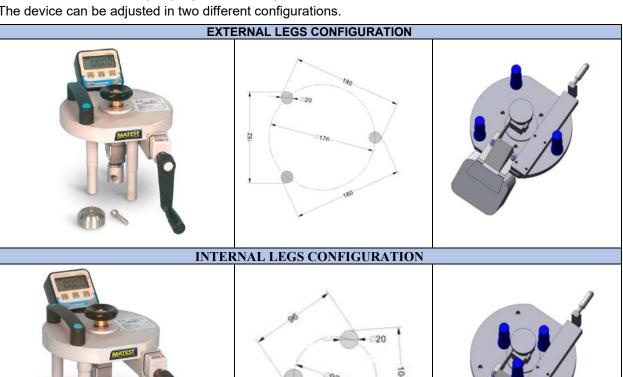
The machine must be installed in an area which allows ease of access to all parts so that maintenance may be carried out.

Unauthorized people and objects which could be potential sources of danger must not be permitted in the area surrounding the machine. Do not position the equipment near instruments or appliances which could produce vibrations.

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# **4.2 ASSEMBLING PROCEDURE**

After removing the packaging, make sure the machine is intact, checking that there are no visibly damaged parts. In case of doubt DO NOT USE THE MACHINE and contact the retailer. The device can be adjusted in two different configurations.



# 5. MAN-COMMAND INTERFACE

# **5.1 COMMANDS AND BUTTONS**

SET	<ul> <li>(1) It performs the instrument switching On.</li> <li>(2) Pushed about 3 seconds it enters into the parameters Menu.</li> <li>(3) Pushed about 5 seconds switch Off the instrument.</li> <li>(4) If enabled, each time the key is pressed for a short time, the display back Light is activated for the time that has been set in the Parameter.</li> </ul>
ZERO	<ul> <li>(1) During the measurement, if pushed for 1 second, it performs the display ZERO.</li> <li>(2) If kept pressed for about 3 seconds it deactivates the ZERO function displaying the offset of the load cell.</li> <li>(3) In Peak Mode, reset the measured peak value.</li> <li>(4) Inside the setting menu it decreases the value on the display.</li> </ul>
PEAK	(1) During the measurement, if pressed for a second, it activates the PEAK+ (2) During the measurement, if pressed for 3 seconds, it activates the PEAK- (3) Inside the setting menu increases the value on the display.
	For further information on the digital unit, consult the relevant operating manual.

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# 6. IN FUNCTION - USE

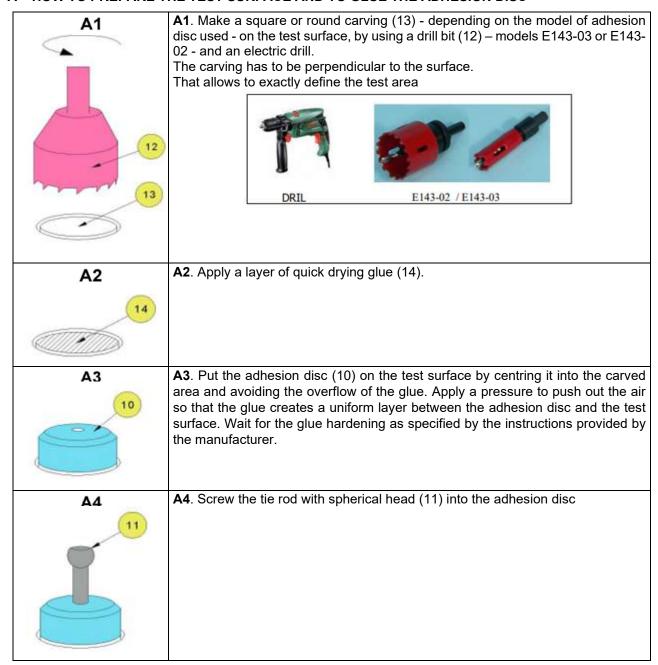
#### **6.1 MACHINE CALIBRATION – METERS – INDICATORS**

The machine is checked in the factory, using sample equipment periodically checked by officially recognised institutes. These checks cannot guarantee that the machine, meters and indicators will provide accurate values and results conforming to the standards in force in the countries the machine has been installed and used in. Normally such norms envisage calibration check after every movement. In order to obtain correct values and results it is therefore VITAL that the operator, once the machine has been installed and set up and before official tests, has an officially recognised body check the machine characteristics, its calibration and results/values reliability. The manufacturer is exempt from all responsibility in the case of direct and indirect damage from use of the machine without officially approval by the relevant bodies.

# 6.2 EQUIPPING - SAMPLE POSITIONING

The operating procedure is described in this paragraph to allow an inexperienced operator to perform the test correctly. It is strongly suggested to consult the relevant International Standard to execute the test correctly.

## A - HOW TO PREPARE THE TEST SURFACE AND TO GLUE THE ADHESION DISC



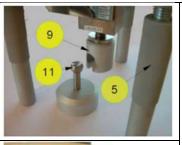
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## B - HOW TO PREPARE THE TEST SURFACE AND TO GLUE THE ADHESION DISC



It is preferable to perform the following operations before starting the test:

- Screw the upper hand wheel (2) completely without forcing it and by rotating it clockwise.
- Zero the round counter (7) by rotating the hand wheel for force application (8) contraclockwise.



- Put the Pull-Off tester next to the adhesion disc with the tie rod with spherical head screwed.
- Before starting the test, check that the tensile head (9) is at a height closed to the one of the tie rod with spherical head (11).
- Adjust the tensile head position by rotating the upper hand wheel (2). If you rotate it contraclockwise, the tensile head will lower and vice versa.



• A further adjustment of the height could be obtained by unscrewing or screwing the three feet (5), paying attention to fix them using the relevant locking ring nuts (15).

It is very important that the Pull-Off tester leans steadily on a surface with its three feet during the test. The Pull-Off plate must be parallel to the surface itself.



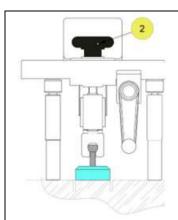
Move the Pull-Off tester in such a way to Insert the tie rod into the connecting slot of the tensile head.

# **6.3 TEST START UP**



Push the "ON" button to turn the digital display on. Push the "ZERO" button to reset to zero the display. Keep the button "PEAK" pushed for few seconds – until the relevant icon will be shown on the display – to set the automatic saving of the peak value of the test. The digital display is provided with an auto power off function.

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Slightly rotate the upper handwheel (2) clockwise until the digital display starts recording a little increase. This procedure is useful to eliminate any clearance between the tie rod and the tensile head.



Start the test by rotating the Hand wheel for force application (8) clockwise. Increase the force continuously and equally - as specified by the International Standard followed by the operator - up to the breakage. Record the force displayed on the digital unit when the breakage occurs. The round counter (7) shows the rounds number performed by the hand wheel during the test.

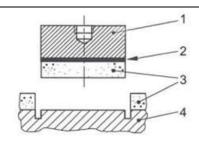
The maximum number of rounds that can be performed is 61.



# WARNING

If the breakage does not occur before the 61st round, the test is not valid. Do not consider any tests as valid if the fracture of the adhesion layer occurs between the adhesion disc and the mortar. Repeat the procedure from the beginning of section "B" of this helpsheet when starting a new test.

The possible types of fracture that lead to valid results are shown in the following pictures. If the fracture is produced without an interface yielding between mortar and the support (as shown in the second and third pictures), the results obtained have to be considered as lower limit values.

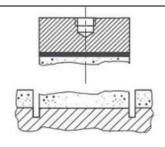


# FRACTURE TYPE A:

Adhesion fracture; fracture that occurs at the interface between mortar and the support. The test value corresponds to the adhesion strength.

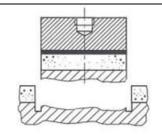
## Legend:

- 1- adhesition test discs
- 2- adhesive surface
- 3- mortar
- 4- support



#### FRACTURE TYPE B:

Cohesion fracture. This fracture occurs within the mortar itself. In this case the adhesion strength is higher than the test strength



# FRACTURE TYPE C:

Cohesion fracture. This fracture occurs within the mortar itself. In this case the adhesion strength is higher than the test strength

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# 7. MAINTENANCE



**DANGER** 

All the operations of maintenance, checking and control must be carried out by personnel professionally qualified and knowledgeable about machine and mechanisms. All the operations must be carried out when the machine is switched off and with the feeding cable physically separated from a knife switch of feeding. It is permitted to use only the original spare parts. The use of not original spare parts free the constructor from the responsibility.

#### 7.1 EXTRAORDINARY MAINTENANCE

For extraordinary maintenance operations refer directly to the Manufacturer.



**DANGER** 

The removal of the safety devices or any tampering of the machine could cause risks to the operator or to any other people.

#### 7.2 AUTHORIZED MAINTENANCE CENTRES

For information on the nearest authorized help center it is essential to contact the Manufacturer.

# 8. SPARE PARTS



WARNING DANGER

Only original spare parts can be used.

Use of unoriginal spare parts exempts the manufacturer from all responsibility. Procedures for substitution of spare parts will be provided by the manufacturer along with the part. For spare parts contact the manufacturer's Sales Service department.

ITEM CODE	QUANTITY	DESCRIPTION
RE142-99	1	16 KN LOAD CELL WITH CONNECTOR FOR E142 MODEL
STVS03651	1	DIGITAL DISPLAY
RE142-96	1	SPARE HYDRAULIC PUMP

1	

**WARNING** 

Please note the replacement of some parts might imply a necessary recalibration of the instrument.

#### 9. INACTIVITY

Ensure all machine parts are in safe working order before operating it again should the machine be inactive for a long period of time. When in doubt contact the Manufacturer.

# 10. DECOMMISSIONING THE MACHINE

Should it be decided that the machine is to be no longer used, proceed as follows:

- Disconnect the electrical supply network by removing the connecting cable therefore making it unusable.
- Make the potential sources of danger harmless, such as sharp or protruding parts.
- Dismantle the machine; divide it into similar parts and dispose of according to the standards in force

# Recycling notice for the disposal of electrical and electronical devices



This symbol, shown on the device or on the package and/or the documentation, suggests that the device should not be disposed together with other home garbage at the end of its life cycle. To avoid further environment, or health-care damage, caused by the unsuitable disposal of garbage, the user should separate this device from other different types of garbage and recycle it in responsibly to avoid the reuse of material resources. Users must take care at the disposal of

the equipment by taking it to the nearest recycling site for appropriate recycling treatment for electrical and electronical devices. Gathering and Recycling deplete devices allow the preservation of natural resources and grant them the adequate treatment by respecting health and environment. For further information on your local recycling site please contact your local council or city waste treatment department.