

# Content

	no.pages
Adiabatic calorimeter as high accuracy T-calibrator	7
About the author	1
Previous issues of GDF DATABANKS BULLETIN	1
Errata	4
10	12

12 +3 pages

any reproduction from

# **GDF DATABANKS BULLETIN**

in other documents and/or publications needs the written agreement of the author All correspondence at: dragan\_gdf@yahoo.com



This Bulletin is registered at:

- Biblioteca Nationala a Romaniei, Bucharest and
- National Library of Australia, Canberra

www.gdfdatabanks.ro

# Adiabatic calorimeter as high accuracy T-calibrator

Temperature is one of the most important and popular quantities in human activities. Despite of a huge number of digital thermometers appearing in the last decade as home appliances for the temperature range -50 to +150  $^{\circ}$ C with 0.1  $^{\circ}$ C resolution, their accuracy and stability are low. These use silicon diode as sensor as such or in specialized integrated circuits performing signal conditioning. But, their low quality originates in lack of proper calibration. More exactly, although silicon diodes have the same voltage-temperature slope (-2.5 mV/ $^{\circ}$ C or 10 mV/ $^{\circ}$ C for integrated circuits), the offset parameter is different even in the same batch of the production line. This needs periodic calibration and proper adjustment of each thermometer as all, so the cost will rise considerably.

The same problem of proper calibration stands for thermometers using other kind of sensors, so that for practical reasons (many thermometers, rapid calibration and their calibration on site) the fluid baths are replaced by portable dry block calibrators. However, these have some unsolved problems, namely at least the followings:

- (i) many users, even metrologists, consider only calibration of sensors not of thermometers as overall;
- (ii) dilemma of what is the correct calibration: (a) by removing the external sensor protection in view to minimize temperature gradients between reference thermometer and the one under calibration, or (b) by considering the overall sensor assembly as it is used in operating conditions;
- (iii) temperature gradients appeared in the dry block are not measured.

My firmly answers to these questions are:

(iA) calibration must be performed on the overall measuring instruments;

(iiA) sensor must be kept as close as possible to the reference value;

(iiiA) gradients values around the reference and under calibration sensors must be properly measured because they define the calibration uncertainty. These gradients increase with the difference between room temperature (RT) and calibration temperature (see thorough studies on ISOCALT calibrators [1]).

Calorimetric systems allow to control and minimize these temperature gradients. In the previous studies, differential and adiabatic calorimeters are considered for T calibrations [2] with accuracies better than 0.01  $^{\circ}$ C. In the present note adiabatic calorimeter designed and used for hydration processes in concrete mixtures [3] is used for T calibrations of thermometers with silicon diodes in package DO35 on the temperature range of RT to +80  $^{\circ}$ C by using water as immersion liquid. Thermometer

with integrated circuit LM335Z in package TO92 (not calibrated) is used as reference thermometer.

### Adiabatic calorimeter

Figure 1 schematically shows the cross section of adiabatic calorimeter vessel. Adiabatic function is realized when temperature of the inner shield is maintained equal with the one of the specimen holder, so that if in the tested specimen does not occur any transformation process, its temperature is maintained constant for long time depending on the adiabatic accuracy. There are some construction tricks and special skills in realizing high adiabatic accuracy. Actual adiabatic calorimeter was able to maintain constant specimen temperature at 0.01  $^{\circ}$ C accuracy even for 1 week in the range of RT to + 80  $^{\circ}$ C. Stability of adiabatic accuracy depends on RT fluctuations near RT, but becomes immune to higher temperatures.

Figure 2 shows the cross section in the specimen holder adapted for temperature calibrations.

Operating temperature can be extended to lower and higher values by using proper materials and special accessories.

Pictures of the adiabatic calorimeter and specimen holder are shown in Figures 3 and 4, respectively.

Figure 5 shows the electronic blocks used for calibration experiments.

### Experimental results

**Operating procedure:** an amount of 0.8 L of hot water is placed in the specimen container taken off from the calorimeter and the temperature sensors are fixed in the lid as it results from Figures 2 and 4. Special care needs by passing the connecting wires through the two lids of the external and the inner shields, respectively. Water temperature is monitored with reference thermometer until almost constant value is reached after that the assembly is placed carefully in the calorimeter closing properly the lids with connecting cables. Adiabatic condition is realized by adjusting the balance (zero) potentiometer from the front panel of electronic block 3 Figure 5 and continuously following the reference temperature. This stage takes approximately 1 hour depending on the experience gained by the operator. After measurements performed at the resulted constant temperature it is possible to decrease or increase to a new constant temperature by adjusting the balance potentiometer. For greater and faster decrease simply disconnect for a period of time the electronic block. It is more suitable to perform experiments at decreasing steps of temperature. For more efficient increasing temperature steps it needs heating and stirring elements inserted in the liquid bath.

<u>Calibration experiments</u> are performed on series of commercial 1N4148 silicon diodes and selected Zener diodes with narrow Uz values all in DO35 packages.

Conditioning circuit is presented in Figure 6, so that out voltage, T(V), is proportional with measured temperature. Circuit allows adjusting offset (RO) and gain (RG) resistors in view to optimize measurements. It is important to note that this circuit is differential and ensures high stability at great gain.

LM335Z is used as reference temperature sensor according to application note given by manufacturer. T(V) and reference temperature are measured with the same digital multimeter (V563, Meratronik, Poland) having 5 digit mantissa. This corresponds to 0.01 <sup>o</sup>C resolution for reference temperature.

Figure 7 shows typical calibration curve and linear fit values for one diode. For all tested diodes the slope values are practically the same. It is important to reveal differences experienced in offset values. These are greater for common 1N4148 silicon diodes even for close specimens of the same production batch and smaller for Zener diodes.

Figure 8 and Table 1 present isothermal average T(V) and associated standard deviation values for most common Zener diodes measured on 10 specimens from the same batch of each type. It is important to reveal the structural origin of these differences in offset value. Sze and Ng shows that temperature variation of semiconductor diodes originates in the energy band gap of intrinsic semiconductor, Eg, so the offset is given by its value at 0 K according to the relationship (Figure 6, p.16 [4]):

$$Eg(T) = -\alpha^{*}T^{2}/(T + \beta) + Eg(0)$$
(1)

where  $\alpha$  and  $\beta$  are specific constants. This equation leads to the following dependence of T(V) for p-n junction in a silicon diode (eqn. (11), p. 747 [4]):

$$T(V) = -(kB*T/q)*|A| + (Eg(0)/q)$$
(2)

where kB = Boltzmann constant, q = electron charge and A < 0 is a parameter insensitive to T variation. The final offset (Eg(0)/q) results to be an intrinsic characteristic of the silicon chip and its variation for chips originated from the same single crystal means structural differences due by defects and/or internal stresses. This random anisotropy can be revealed by etching techniques [5] as it was thoroughly studied, mainly by calorimetry, in the series on amorphous-crystalline coupling in polyethylenes and other crystalline materials [6]. Doping procedures in obtaining p and n species are in fact etching processes amplifying this anisotropy in the mother intrinsic silicon chips. Offset value obtained by temperature calibration can be used as an intrinsic pattern of mother silicon chips by considering standard doping conditions and an estimation of Eg(0).

In view to minimize offset the p-n junction of the bipolar transistor is currently used as temperature sensor. However, thorough experiments according to topoenergetic principles [7] will identify more accurately structural elements responsible for this phenomenon.

# Concluding remarks

- 1. Adiabatic calorimeter allows high accuracy and long term stability for isothermal conditions with practically zero temperature gradients in the immersion bath.
- 2. It needs a small immersion bath with no moving parts and low consumption of energy and can be adapted for much lower and higher temperature ranges.
- 3. It results once again linear temperature dependence of silicon diodes as such or included in integrated circuits having signal conditioner, on the most used temperature range in human activities (-50 to +150 <sup>0</sup>C).
- 4. Value of T(V) measured at standard temperature and conditioning circuit (Figure 6) for a diode doped also in standard conditions is a good measure of offset and energy gap of the intrinsic silicon chip.
- 5. It can be used efficiently to resume experiments at higher accuracy on NTC thermistors [8] and other similar experiments according to the topoenergetic principles (for instance to reveal with high accuracy the dynamics of basic fixed points in ITS-90 [2]) in view to establish the exact corrections of ITS-90 (see studies on phase transitions using adiabatic calorimetry [9-10]).

### References

[1] G. Dragan, ISOCALT: A new technique for temperature measurement and calibration, GDF Databanks Bull., 9(2) (2005).

[2] G. Dragan, Aspects of correct measurements of temperature. I. Measurement of a fixed point according to ITS-90, GDF Databanks Bull., 8(2) (2004).

[3] G. Dragan, Adiabatic calorimetry – summary description of the demo prototype, GDF Databanks Bull., 12(3) (2008).

[4] S,M. Sze and Kwok K. Ng, Physics of Semiconductor Devices, Wiley Interscience, 3d edition, 2007.

[5] Kazuo Sato, Mitsuhiro Shikida, Takashi Yamashiro, Kazuo Asaumi, Yasuroh Iriye, Masaharu Yamamoto, Anisotropic etching rates of single-crystal silicon for TMAH water solution as a function of crystallographic orientation, Sensors and Actuators A: Physical, 131-137 (1999).

[6] G. Dragan, Topological model of the crystalline morphology in polyethylenes with grafted defects, J.Polymer Sci., Polymer Symposium, 64, 141-148 (1978).

[7] G. Dragan, Structural and relativistic aspects in transforming systems. I. Arrhenius and

Universal representations of thermally driven processes, GDF Databanks Bull., 15(2) (2011).

[8] G.Dragan, Calibration of NTC-thermistors (The 14<sup>th</sup> International Metrology Congress, Paris, France, 22-25 June 2009), GDF Databanks Bull., 13(1) (2009).

[9] Adiabatic calorimetric studies performed by Japanese scientists (for instance H. Suga and coworkers) on phase transitions at low temperatures for a wide variety of substances.

Hiroshi Suga, QUO VADIS – Low temperature calorimetry, Kinki University, Kowakae Higashi-Osaka, 2000, Japan.

[10] G. Dragan, Topoenergetic aspects of solid-solid phase transition in SnCl2(H2O)x(D2O)(2-x) systems, Rev.Roumaine Phys., 27(3), 297-308 (1982).



Figure 1. Schematic cross section in the vessel of adiabatic calorimeter.



Figure 2. Schematic cross section in the specimen holder adapted for T-calibrations.





Figure 4. Sample holder adapted for T-calibration in the range of Troom:+90 oC.

Figure 5. Electronic blocks 1- conditioner block for 1N4148 2- conditioner block for LM335Z 3- block for adiabatic function

4- 5 digit mantissa multimeter

GDF DATABANKS BULLETIN, VOL. ISSN 1453 - 1674 18, NO. 1, 2014









Figure 7.

Table 1. Statistic T(V) values obtained on 10 specimens for each type of most common Zener diodes in package Do35 at 14.7 oC.

Uz,V	average,V	stdev,V
3.3	-2.595	0.12
5.1	-0.757	0.75
5.6	-2.373	0.17
6.2	-2.16	0.11

# About the author:

First name	Gheorghe
Last name	Dragan
Born	1 September 1945, Ploiesti, Prahova (Romania)
Studies	Faculty of Physics, University of Bucharest, Romania (1963-1968) Ph.D.in Physics, University of Bucharest, Romania (1980)
experience	<ul> <li>Head of material testing laboratory, ICECHIM, Polymer Department, Bucharest (1969-1979);</li> <li>Initiator and leader of the research project on new forms and sources of energy; ICECHIM, Center of Physical Chemistry (1979-1988);</li> <li>Head of laboratory of analytical devices and measuring instruments, AMCO-SA, Bucharest (1988- 1993);</li> <li>Technical manager of GDF-DATA BANKS, Bucharest (1993-2008);</li> <li>Expert metrologist, Romanian Bureau of Legal Metrology, Bucharest, Romania (1997-2000).</li> </ul>
publications	<ul> <li>&gt;100 scientific papers</li> <li>&gt;70 scientific communications</li> <li>17 patents</li> <li>5 books</li> </ul>
Address:	all correspondence by e-mail: dragan_gdf@yahoo.com gdf.dragan@gmail.com

### Previous issues of GDF DATABANKS BULLETIN

\$*)
partition
Б
nciples.
n-alkane
AFI
on and
pects;
tures in F
ifin-SA,
AFI
s AFI
The first AFI
7111
es (Dan
F
1
cs.
AFI
boratory
_
thermo-
nalysis.
ordeaux,
AFI
gress.
(
s (paper
Frascati, F
-1 1
of and
trology.
/iscosity
F
(R)
®

2002         6         1         molten salts; thermally driven viscosity and electrical AFI conductance.           2002         6         2         Editorial: HuPOrest - Operator calibration or temporal scale psychic test.           2002         6         3         Editorial: Quo vadis Earth experiment?         F           2003         7         1         Editorial: Ture - an instrument of the selfish thinking.         F           2003         7         1         Editorial: Ture - an instrument of the selfish thinking.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.170/2.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.         F           2004         8         2         Physics and Homoeopathy: some physical requirements for fomoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest.         F           2005         9         1         AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest.         F           2005         9         1         Polytechnic Un				MOSATOR-01: Topoenergetic databanks for one component		
2002       6       1       Inverse memory and process of the proces the the process of the proces of the process	2002	6	1	molten salts: thermally driven viscosity and electrical	AFI	
2002         6         2         Description         F           2002         6         2         Editorial: HuPoTest - Operator calibration or temporal scale psychic test. MOSATOR: topoenergetic databanks of one component molten salts; thermally driven viscosity and electrical conductance.         F           2002         6         3         Editorial: Time - an instrument of the selfish thinking.         F           2003         7         1         Editorial: Time - an instrument of the selfish thinking.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/70/2.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.         F           2004         8         2         Physics and Homocopathy: some physical requirements for homocopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2004         8         2         Physics and Homocopathy: some physical requirements for homocopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2005         9         1         Polytechnic University of Bucharest.         F           2005         9         1         Polytechnic University of Su	2002	Ū	1	conductance.		
2002         6         2         psychic test. MOSATOR: topoenergetic databanks of one component molten salts; thermally driven viscosity and electrical conductance.         F           2002         6         3         Editorial: Quo vadis Earth experiment? ISOCALT®: Report on metrological tests         F           2003         7         1         I <sup>an</sup> NOTE: Homocopathy: upon some efficient physical tests revealing structural modifications of water and aqueous solutions. I. Mixing experiments.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.170/2.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.170/2.         F           2004         8         2         Physics and Homocopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2005         9         1         Polytechnic University of Bucharest.         F           2005         9         1         Polytechnic University of Bucharest.         S/2020, Lyon, France)         F           2005         9         2         A new technique for temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         F           2005         9	-			Editorial: HuPoTest - Operator calibration or temporal scale		
2002         6         2         MOSATOR: topoenergetic databanks of one component molten salts; thermally driven viscosity and electrical conductance.         F           2002         6         3         Editorial: Quo vadis Earth experiment? ISOCALT® : Report on metrological tests         F           2003         7         1         Editorial: Time – an instrument of the selfish thinking.         F           2003         7         1         Retrological verifications of water and aqueous solutions. I. Mixing experiments.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/70/2. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.7R.         F           2004         8         2         Physics and Homocopathy: some physical requirements for homocopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2005         9         1         Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         F           2005         9         2         National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).         F           2005         9         2         National Society of Measure				nevenic test		
Intervention         Important Street         Important Street           2002         6         3         Editorial: Quo vadis Earth experiment? ISOCALT® : Report on metrological tests         F           2003         7         1         Editorial: Time – an instrument of the selfish thinking.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.1/0/2.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.1/0/2.         F           2004         8         2         Physics and Homeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2005         9         1         AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest, ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest.         F           2005         9         1         Polytechnic University of Bucharest.         F           2005         9         2         A new technique for temperature measurements. (12 <sup>th</sup> International Metrol	2002	6	2	MOSATOR: tonoenergetic databanks of one component molten	F	
2002         6         3         Editorial: Que valis Earth experiment? ISOCALT® : Report on metrological tests         F           2003         7         1         1*** NOTE: Homeopathy: upon some efficient physical tests revealing structural modifications of water and aqueous solutions. I. Mixing experiments.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.170/2. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2 R.         F           2004         8         2         Physics and Homocopathy: some physical requirements for fomoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2005         9         1         AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest, ISOCALT® 370/21 was awarded in a selection of 20 products by a commission of experts from the Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         F           2005         9         2         A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).         F           2005         9         2         National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific). <t< td=""><td></td><td></td><td colspan="2">salts: thermally driven viscosity and electrical conductance</td><td></td></t<>			salts: thermally driven viscosity and electrical conductance			
2002     6     3     Entional: Quo Values Earth experiment?     F       2003     7     1     Editorial: Time - an instrument of the selfish thinking.     F       2003     7     1     Editorial: Time - an instrument of the selfish thinking.     F       2004     8     1     Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/70/2.     F       2004     8     1     Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.     F       2004     8     2     Physics and Homocopathy: some physical requirements for homocopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)     F       2005     9     1     Polytechnic University of Bucharest.     F       2005     9     1     Polytechnic University of Bucharest.     F       2005     9     1     Polytechnic University of Bucharest.     F       2005     9     2     National Society of Measurements (NSM).     F       2005     9     2     National Society of Measurements (NSM).     F       2005     9     2     A new technique for temperature measurement and calibration.     F       2005     9     2     A new technique for temperature measurement and calibration.     F       2005				Saits, thermany driven viscosity and electrical conductance.		
2003         7         1         ISOCALT® : Report on metrological tests           2003         7         1         Editorial: Time – an instrument of the selfish thinking.         F           2004         8         1         Mixing experiments.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.1/70/2.         F           2004         8         1         Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.1/70/2.         F           2004         8         2         Physics and Homocopathy: some physical requirements for homocopathy practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2005         9         1         Polytechnic University of Bucharest.         F           2005         9         1         Polytechnic University of Bucharest.         F           2005         9         1         Polytechnic University of Bucharest.         F           2005         9         1         Polytechnic University of Measurements (NSM).         F           2005         9         1         Polytechnic Of Cancer Diseases.         1. First sight on NSW-2003 report.           2005         9         2         Natio	2002	6	3	Editorial: Quo vadis Earth experiment?	F	
2003       7       1       1 <sup>st</sup> NOTE: Homocopathy: upon some efficient physical tests revealing structural modifications of water and aqueous solutions. I. Mixing experiments.       F         2004       8       1       Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.170/2. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.       F         2004       8       2       Physics and Homocopathy: some physical requirements for homocopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2004       8       2       Physics and Homocopathy: some physical requirements for homocopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2005       9       1       Polytechnic University of Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       2       A new technique for temperature measurement and calibration. NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3 <t< td=""><td></td><td></td><td></td><td>ISOCAL I (® : Report on metrological tests</td><td></td></t<>				ISOCAL I (® : Report on metrological tests		
2003       7       1       1" NOTE: Homoeopathy: upon some efficient physical tests revealing structural modifications of water and aqueous solutions. I. Mixing experiments.       F         2004       8       1       Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/702. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.       F         2004       8       2       Aspects of correct measurements of temperature. I. measurement of a fixed point according to ITS-90. Monoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, ROmania)       F         2005       9       1       AWARD for ISOCALT® 37/021 was awarded in a selection of 20 products by a commission of experts from the Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       NSW-2003 report.         2005       9       2       A new technique for temperature measurement and calibration.       F         2005       9       2       A new technique for temperat				Editorial: Time – an instrument of the selfish thinking.		
2000       1       revealing structural modifications of water and aqueous solutions. I. Mixing experiments.       1         2004       8       1       Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/70/2. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.       F         2004       8       2       Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest. ISOCALT® 37/0/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest.       F         2005       9       1       Revetchnique for temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002.       Vital Potential can estimate our predisposition for cancer di	2003	7	1	1 <sup>st</sup> NOTE: Homoeopathy: upon some efficient physical tests	F	
I. Mixing experiments.           2004         8         1           Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/70/2.         F           2004         8         1         Aspects of correct measurements of temperature. I. measurement of a fixed point according to ITS-90.         F           2004         8         2         Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         F           2005         9         1         Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         F           2005         9         2         A new technique for temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         F           2005         9         2         A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).         F           2005         9         3         Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.         NSW-2003 report.           2005         9         3         Universal representation of Cancer Diseases.         F           2005 <td< td=""><td>2005</td><td>,</td><td>-</td><td>revealing structural modifications of water and aqueous solutions.</td></td<>	2005	,	-	revealing structural modifications of water and aqueous solutions.		
2004       8       1       Metrological verification and calibration of thermometers using thermostats type ISOCALT® 21/70/2. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.       F         2004       8       2       Physics and Homocopathy: some physical requirements for homocopathic practice. (Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest, ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       1       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator suesrs: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       2       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       NSW-2003 report.         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002.       F         2005       9       1       1       Nuriversal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       NSW-2003 report.         2005       9       3       Universal representation of Cancer Diseases. 2. UK c				I. Mixing experiments.		
2004       8       1       thermostats type ISOCALT® 21/70/2. Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.       F         2004       8       2       Physics of correct measurements of temperature. I. measurement of a fixed point according to ITS-90.       F         2004       8       2       Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2005       9       1       Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.       F         2007 <td></td> <td></td> <td></td> <td>Metrological verification and calibration of thermometers using</td> <td></td>				Metrological verification and calibration of thermometers using		
2004       8       1       Metrological verification and calibration of thermometers using thermostats type ISOCALT® 2.2R.         2004       8       2       Aspects of correct measurements of temperature. I. measurement of a fixed point according to ITS-90.         2004       8       2       Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)         2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         2005       9       1       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002.         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002.         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. <td>2004</td> <td>0</td> <td>1</td> <td>thermostats type ISOCALT® 21/70/2.</td> <td>Б</td>	2004	0	1	thermostats type ISOCALT® 21/70/2.	Б	
intermostats type ISOCALT® 2.2R.           2004         Aspects of correct measurements of temperature. I. measurement of a fixed point according to ITS-90.           2004         Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)           2005         9         1           2005         9         1           2005         9         1           2005         9         1           2005         9         1           2005         9         1           2005         9         1           Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         F           2005         9         2         A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).         F           2005         9         3         Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.           2005         9         3         Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.         F           2007         1	2004	0	1	Metrological verification and calibration of thermometers using	Г	
2004       8       2       Aspects of correct measurements of temperature. I. measurement of a fixed point according to ITS-90.         2004       8       2       Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM).       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM).       F         2005       9       2       A new technique for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       2       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       NSW-2003 report.       F         2006       10       1       NTC - thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases       F				thermostats type ISOCALT® 2.2R.		
2004       8       2       of a fixed point according to TTS-90. Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002.       F         2006       10       1       NTC - thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       HuPOTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPOTest report <td></td> <td></td> <td></td> <td>Aspects of correct measurements of temperature. I. measurement</td> <td></td>				Aspects of correct measurements of temperature. I. measurement		
2004       8       2       Physics and Homoeopathy: some physical requirements for homoeopathic practice.(Plenary lecture at the 19 <sup>th</sup> SRH National Congress, 21-22 September 2004, Bucharest, Romania)       F         2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest, ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)         2005       9       1       Polytechnic University of Bucharest. (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       2       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       SW-2003 report.         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer F registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.       F         2007       11       1       NTC – thermistors -1       AFI         2007       11       1       NTC – thermistors -1       AFI         2007       11       2       HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality       F         <				of a fixed point according to ITS-90.		
2001       1000000000000000000000000000000000000	2004	8	2	Physics and Homoeonathy some physical requirements for	F	
2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest, ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest.       F         2005       9       1       Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       3       electric and magnetic properties Climate change = change of mentality       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       3       electric and magnetic propertie		Ũ	_	homoeonathic practice (Plenary lecture at the 19 <sup>th</sup> SRH National	-	
2005       9       1       AWARD for ISOCALT® at the International Fair TIB-2004, October 2004, Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Polytechnic University of Bucharest.       F         2005       9       1       Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       TRESISTOR© - data banks of materials with thermally driven of complete test, order and obtain your complete HuPoTest report       AFI         2007       11       3       electric and magnetic properties Droget of actual banks of materials with thermally driven of complete test, order and obtain your complete HuPoTest report       AFI				Congress 21-22 September 2004 Bucharest Romania)		
2005       9       1       Polytechnic University of Bucharest. ISOCALT® 3/70/21 was awarded in a selection of 20 products by a commission of experts from the Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       1       Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       SW-2003 report.         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases. Climate change = change of mentality       F         2007       11       1       MT – Introduction to Mental Technology       F         2007       11       2       HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       2       HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete Hu	-			AWARD for ISOCALT® at the International Eair TIB-2004		
2005       9       1       Beletion of 20 products by a commission of experts from the Polytechnic University of Bucharest.       F         2005       9       1       Polytechnic University of Bucharest.       F         2005       9       1       Polytechnic University of Bucharest.       F         2005       9       2       A new technique for temperature measurements.       F         2005       9       2       A new technique for temperature measurement and calibration.       National Society of Measurements (NSM).         Important warning for T-calibrator users:       MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases.       1. First sight on NSW-2003 report.         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases.       F         2007       11       1       Basic rules for preventing and vanishing cancer diseases       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       2       MT – Introd				October 2004 Bucharest ISOCALT® 3/70/21 was awarded in a		
2005       9       1       Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       2       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.       F         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       2       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties       AFI				october 2004, Buchalest. ISOCALI® 5/70/21 was awalded ill a		
2005       9       1       Polytechnic University of Bucharest. Upon some aspects of temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.       F         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       electric and magnetic properties TRESISTOR@ - Mate howle of NTC thermistors       AFI	2005	0	1	Selection of 20 products by a commission of experts from the	Б	
2005       9       2       A new technique for temperature measurements. (12 <sup>th</sup> International Metrology Congress, 20-23 June 2005, Lyon, France)       F         2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.       F         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       2       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties       AFI         2007       11       3       electric and magnetic properties       AFI	2005	9	1	Polytechnic University of Bucharest.	Г	
2005       9       2       A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).       F         2005       9       2       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.       F         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer F registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.       F         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       3       electric and magnetic properties       AFI				Upon some aspects of temperature measurements.		
PrancePrance200592A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).F200593Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.F200593Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.F2006101NTC - thermistors -1AFI2007111Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentalityF2007112MT – Introduction to Mental TechnologyF2007113electric and magnetic properties of complete test, order and obtain your complete HuPoTest reportAFI2007113TRESISTOR© - data banks of materials with thermally driven electric and magnetic propertiesAFI				(12 International Metrology Congress, 20-23 June 2005, Lyon,		
200592A new technique for temperature measurement and calibration. National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).F200593Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.F200593Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.F2006101NTC - thermistors -1AFI2007111HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentalityF2007112MT – Introduction to Mental TechnologyF2007113electric and magnetic properties TRESISTOR© - data banks of materials with thermally driven electric and magnetic propertiesAFI				France)		
200592National Society of Measurements (NSM). Important warning for T-calibrator users: MSA has chose metrology well calibrators from Fluke (Hart Scientific).F200593Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.F200593Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.F2006101NTC - thermistors -1AFI2007111HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentalityF2007112MT – Introduction to Mental TechnologyF2007113electric and magnetic properties TRESISTOR© - data banks of materials with thermally driven electric and magnetic propertiesAFI				A new technique for temperature measurement and calibration.		
ImportantWarning for T-calibratorUsers:MSA has chose metrology well calibrators from Fluke (Hart Scientific).200593Universal representation of Cancer Diseases.1. First sight on NSW-2003 report.200593Universal representation of Cancer Diseases.2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.2006101NTC - thermistors -1AFI2007111HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentalityF2007112MT – Introduction to Mental TechnologyF2007113electric and magnetic properties TRESISTOR© - data banks of materials with thermally driven electric and magnetic propertiesAFI	2005	9	2	National Society of Measurements (NSM).	F	
2005       9       3       Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.         2005       9       3       Universal representation of Cancer Diseases. 2. UK cancer F registrations on 1999-2002.         2006       10       1       NTC – thermistors -1       AFI         2007       11       1       HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases       F         2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       electric and magnetic properties       AFI		-	_	Important warning for T-calibrator users: MSA has chose	_	
200593Universal representation of Cancer Diseases. 1. First sight on NSW-2003 report.200593Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.2006101NTC - thermistors -12007111HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentalityF2007112MT – Introduction to Mental Technology Of complete test, order and obtain your complete HuPoTest reportF2007113electric and magnetic properties TRESISTOR© - data banks of materials with thermally driven alpending on NTC 1 data banks of NTC thermistorsAFI				metrology well calibrators from Fluke (Hart Scientific).		
200593NSW-2003 report. registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.2006101NTC - thermistors -1AFI2007111HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentalityF2007112MT – Introduction to Mental TechnologyF2007112HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest reportF2007113electric and magnetic properties TRESISTOR© - data banks of materials with thermally driven TRESISTOR© - I data banks of NTC thermistorsAFI				Universal representation of Cancer Diseases. 1. First sight on		
200593Universal representation of Cancer Diseases. 2. UK cancer registrations on 1999-2002. Vital Potential can estimate our predisposition for cancer diseases.2006101NTC – thermistors -1AFI2007111HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentalityF2007112MT – Introduction to Mental Technology ulter and obtain your complete HuPoTest reportF2007113TRESISTOR© - data banks of materials with thermally driven electric and magnetic propertiesAFI				NSW-2003 report.		
2006       10       1       NTC – thermistors -1       AFI         2007       11       1       HuPoTest - 40 years of continuous research       Basic rules for preventing and vanishing cancer diseases       F         2007       11       1       Basic rules for preventing and vanishing cancer diseases       F         2007       11       1       MT – Introduction to Mental Technology       F         2007       11       2       HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       electric and magnetic properties       AFI	2005	9	3	Universal representation of Cancer Diseases. 2. UK cancer	F	
2006       10       1       NTC – thermistors -1       AFI         2007       11       1       HuPoTest - 40 years of continuous research       Basic rules for preventing and vanishing cancer diseases       F         2007       11       1       Basic rules for preventing and vanishing cancer diseases       F         2007       11       1       MT – Introduction to mentality       F         2007       11       2       MT – Introduction to Mental Technology       F         2007       11       2       HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       electric and magnetic properties       AFI				registrations on 1999-2002.		
2006       10       1       NTC - thermistors -1       AFI         2007       11       1       HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       electric and magnetic properties TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties       AFI				Vital Potential can estimate our predisposition for cancer diseases.		
2007       11       1       HuPoTest - 40 years of continuous research Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties       AFI	2006	10	1	NTC – thermistors -1	AFI	
2007       11       1       Basic rules for preventing and vanishing cancer diseases Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties       AFI				HuPoTest - 40 years of continuous research		
2007       11       1       Climate change = change of mentality Hot nuclear fusion – a project of actual mentality       F         2007       11       2       MT – Introduction to Mental Technology HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report       F         2007       11       2       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties       AFI	2007	11		Basic rules for preventing and vanishing cancer diseases	Б	
Hot nuclear fusion – a project of actual mentality         2007       11       2         MT – Introduction to Mental Technology         HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report         TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties         AFI	2007	11	1	Climate change = change of mentality	Г	
2007       11       2       MT – Introduction to Mental Technology         2007       11       2       HuPoTest – general procedure, assignments of results, specimen of complete test, order and obtain your complete HuPoTest report         2007       11       3       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties         AFI       TRESISTOR© - NTC 1 - data bank of NTC thermistors				Hot nuclear fusion – a project of actual mentality		
2007       11       2       HuPoTest – general procedure, assignments of results, specimen F of complete test, order and obtain your complete HuPoTest report       F         2007       11       3       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties       AFI         2007       11       3       Electric and magnetic properties       AFI				MT – Introduction to Mental Technology		
2007       11       2       Interpreter general proceedary, assignments of results, specified of complete test, order and obtain your complete HuPoTest report         2007       11       3       TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties         AFI       TRESISTOR© - NTC 1 - data bank of NTC thermistory       AFI	2007	11	2	HuPoTest – general procedure assignments of results specimen	F	
2007     11     3     TRESISTOR© - data banks of materials with thermally driven electric and magnetic properties     AFI	/		_	of complete test, order and obtain your complete HuPoTest report	*	
2007 11 3 electric and magnetic properties AFI				TRESISTOR $@$ - data banks of materials with thermally driven		
$\begin{bmatrix} 2007 & 11 & 5 \\ TDESISTOD & NTC 1 & data hank of NTC thermistors \\ \end{bmatrix}$	2007	11	3	electric and magnetic properties	ΔFI	
$\mathbf{L}$ <b>NONDALIZATION</b> $\mathbf{L}$ = $\mathbf{L}$ <b>NONDALIZATION</b> $\mathbf{L}$ <b>CONTRACTOR OF CONTRACTOR</b>	2007	11	5	TRESISTOR $\bigcirc$ - NTC -1 - data bank of NTC thermistors		

2008	12	1	Australian population: life, death and cancer	F	
2008	12	2	Pattern of Cancer Diseases		
2008	10	2	Adiabatic calorimetry - summary description of the demo	Б	
2008	12	5	prototype		
			Flight QF 30 and even more		
2008	12	4	Temperature calibration of NTC-thermistors. 1.Preliminary	F	
	results.				
			Proposal for interlaboratory comparisons.		
2009	13	1	Calibration of NTC-thermistors (The 14 <sup>th</sup> International Metrology	F	
			Congress, Paris, France, 22-25 June 2009).		
2000	13	2	Sudoku – un algoritm de rezolvare.	ΛEI	
2009	15	2	(Sudoku – an algorithm for solution).	API	
2009	13	3	Cancer and Diabetes – as social diseases.	F	
2007	15	5	(Open letter to all whom it may concern).	1	
2010	14	1	Studies on cement hydration by High Resolution Mixing	F	
2010	17	1	Calorimetry (HRMC).	1	
2010	14	2	Measuring tools for subtle potentials;	F	
2010	17	2	pas-LED: an efficient measuring tool for subtle potentials.	1	
2010	14	3	Upon some features of cancer in Australia: 1982 – 2006.	F	
2010	14	4	Cancer as an erosion process in human society.	F	
2010	14	5	Cancer erosion in Australian human society: 1982 – 2006.	F	
2010	14	6	Cancer erosion in German human society:1980-2008.		
2011	15	1	Procedures and devices for energy and water saving. (I) (in	F	
2011	15	1	Romanian).	1	
			Structural and relativistic aspects in transforming systems.		
2011	15	2	I. Arrhenius and Universal representations of thermally driven	F	
processes.					
2011	15	3	Topoenergetic aspects of water structuring as revealed by ac	F	
			electric conductivity.	-	
2011	15	4	Topoenergetic aspects of human body	F	
2011	15	5	HuPoTest: four month study of a case	F	
2012	16	1	DTA study of water freezing.	F	
2012	10	•	I. Upon some aspects of repeatability.	•	
2012	16	2	DTA study of water freezing.	F	
			II. Statistical features on one week of experiments.		
2012	16	3	DTA study of water freezing.	F	
-	_		III. New facts on daily mental field.		
2012	16	4	Mental field and state of health.	F	
-	_		Câmpul mental și starea de sănătate.		
2013	17	1	DTA study of water freezing.	F	
2012	17	-	IV. New facts on energy circuits.	-	
2013	17	2	DIA study of water treezing. V. Effect of a mental antenna	F	
2013	17	3	AC electric conductivity of untreated and mentally treated	F	
0010	17	4	electrolyte aqueous solutions.	-	
2013	17	4	DTA study of water freezing. VI. Mental field in a working day.	F	
2013	17	5	DIA study of water freezing. VII. More statistical features on one	F	
0010	15		week of experiments.		
2013	17	6	HuPoTest: New measurements and results	F	

2013	17	7	Time as unique base quantity. (Proceedings of the 16th International Congress of Metrology, 7-10 October 2013, Paris, France).	
2013	17	8	Eurovision song contest. 1.Basic social aspects	
2013	17	9	Mental field-water interaction as evidenced by Isothermal Convection Flow Calorimetry (ICFC). I. ICFC description and preliminary results.	
2013	17	10	<ul> <li>Procedure for defining standard liquids for viscosity based on topoenergetic principles.</li> <li>Topological aspects of flow and deformation in polymer composites, The VIII-th International Congress on Rheology, 1-5 September 1980, Naples, Italy, pp. 375-376.</li> <li>Universal representation of flow behavior based on topoenergetic principles, The IX-th International Congress on Rheology, 8-13 October 1984, Accapulco, Gro. Mexico, pp.369-376.</li> <li>Comments on "Universal representation of flow behavior based on topoenergetic principles, The IX-th International Congress on Rheology, 8-13 October 1984, Accapulco, Gro. Mexico, pp.369-376.</li> <li>Comments on "Universal representation of flow behavior based on topoenergetic principles, The IX-th International Congress on Rheology, 8-13 October 1984, Accapulco, Gro. Mexico, pp. 369-376."</li> <li>Open letter to BRML and INM.</li> </ul>	F

\*) F=free, AFI=ask for invoice.

### ERRATA:

VOL	NO	place	was written	must be
15	2	Figure 5	P+	P-
15	3	page 5, row 7 down-to-up	x=2	x=0.2

I encourage readers to advice me any observation.

GDF DATABANKS BULLETIN, VOL. 18, NO.1, 2014 Please feel free to distribute in integral form this issue. All correspondence at the author. dragan\_gdf@yahoo.com gdf.dragan@gmail.com

> Any reproduction from GDF DATABANKS BULLETIN in other documents and/or publications needs the written agreement of the author



www.gdfdatabanks.ro