

# ALLA FRANCE s.a.r.l.

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www.allafrance.com


Chemillé, 01/10/2010

## IMPORTANT INFORMATION : PLEASE READ THIS DOCUMENT CAREFULLY !

Ladies & Gentlemen !

The ALLA FRANCE catalogue has a new look!
While flicking through it, we invite you to discover our work and our knowledge in the production of glass instrumentation for laboratories, knowledge acquired during more than 2 centuries of manufacturing experience.

We have made the choice with this new catalogue format to highlight our product's qualitative features, their traceability, their technical advantages, their links to our interactive website and technical support as additional help for your Customer Service team. This document is decidedly oriented towards your sales staff and your customers.

### Our new catalogue format : how it works?

- Each section introduces a product group with its benefits by trademark, by geographic area or by market segment.
- Tables indicating the official standard and/or the main technical features, are identified by a red code number, enabling you to identify the product in our product listing.
- On this complete listing are enumerated the reference numbers, the ranges and additional technical information.

**Example:**

**1- catalogue table**

**ISO 649 - NF B35511 - BS 718 - DIN 12791**
**A.S.T.M. method D1298**
**PETROLEUM INDUSTRY**
They are calibrated for a low superficial tension (between 16 and 35 mN/m).
Reading below meniscus.

SEE CODE

**D 019** **L50 - SP Series**

| | | |
|---|---|---|
| Temp. | 15 °C | Range g/ml |
| Division | 0.0005 g/ml | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... |
| Accuracy | 0.0003 g/ml | ..... - 1.050<br>1.050 - 1.100 |
| Length | 335 mm | |

**2- listing**

SEE CODE

**ARÉOMÈTRES - HYDROMETERS - DENSÍMETROS**

| Pag. | Réf / Item / Código | Ancienne / Old / Antiguo | Amplitude / Range / Rango | Unité / Unit Unidad | Div. | Precision Accuracy | T.S. mN/m | Standard / Serie |
|---|---|---|---|---|---|---|---|---|
| D 019 | 649 SP - NF B35511 SP - BS 718 SP - DIN 12791 SP 15°C | | | | | | | |
| 35 | 3503LC060/15/B-qp | 350L06015 ISO649SP-B | 0.600-0.650 | g/ml | 0.0005 | ± 0.0003 | 17.5 | L50 SP |
| 35 | 3503LC065/15/B-qp | 350L06515 ISO649SP-B | 0.650-0.700 | g/ml | 0.0005 | ± 0.0003 | 20 | L50 SP |
| 35 | 3503LC070/15/B-qp | 350L07015 ISO649SP-B | 0.700-0.750 | g/ml | 0.0005 | ± 0.0003 | 22.5 | L50 SP |
| 35 | 3503LC075/15/B-qp | 350L07515 ISO649SP-B | 0.750-0.800 | g/ml | 0.0005 | ± 0.0003 | 25 | L50 SP |
| 35 | 3503LC080/15/B-qp | 350L08015 ISO649SP-B | 0.800-0.850 | g/ml | 0.0005 | ± 0.0003 | 27.5 | L50 SP |
| 35 | 3503LC085/15/B-qp | 350L08515 ISO649SP-B | 0.850-0.900 | g/ml | 0.0005 | ± 0.0003 | 30 | L50 SP |
| 35 | 3503LC090/15/B-qp | 350L09015 ISO649SP-B | 0.900-0.950 | g/ml | 0.0005 | ± 0.0003 | 32.5 | L50 SP |
| 35 | 3503LC095/15/B-qp | 350L09515 ISO649SP-B | 0.950-1.000 | g/ml | 0.0005 | ± 0.0003 | 35 | L50 SP |
| 35 | 3503LC100/15/B-qp | 350L10015 ISO649SP-B | 1.000-1.050 | g/ml | 0.0005 | ± 0.0003 | 35 | L50 SP |
| 35 | 3503LC105/15/B-qp | 350L10515 ISO649SP-B | 1.050-1.100 | g/ml | 0.0005 | ± 0.0003 | 35 | L50 SP |

Promo Lab®

BIO EMP®

*french cooking by* ®

## New reference numbers

Our recent change in computer software has obliged us to modify our reference numbers.
In order to help you as much as possible, we have indicated our old reference numbers next to the new ones. In addition, a support document listing all products by numerical order is available at the following link http://www.allafrance.com/cata/ref-croisees.htm

This new organisation will enable both our companies to organise marketing in different ways.

## Us to you

- The product listing will act as a base for our price list, including price breaks and minimum quantities.

## You to your market

- You could send our leaflet and our standard listing without prices to your main customers.
  By doing so, your advertising and those of our products are assured.

- If you wish, we can e-mail to you the IT version (Excel spreadsheet) of the listing. When using the spreadsheet or the extracts which interest you, by simply adding your reference numbers you can create a price list for your market.

By keeping our product reference next to yours, we will have already cross referenced products.
It is entirely up to you if you wish to modify the minimum order quantity, or, why not add a column "Available stock ", and indicate the stock quantity you hold.

## Organised and Easy :

To send an order to ALLA FRANCE, why do you not use this spreadsheet or an extract from it?
You have just to :

- Add a column titled "Order"
- Indicate the quantity next to each article
- Programme the calculation into the column concerning CP (Cost Price) x Quantity
- Name the spreadsheet Purchase Order from "company name.xxxx"
- Stock it and send it

This file could then also be used as a base for an offer, a quote or a pro-forma.

Finally, this documentation is available in French, English and Spanish.

## Additional products

As you certainly already know, ALLA FRANCE proposes several other complementary ranges, on a market segment basis, presented on page 3 of the catalogue.
Sector by sector leaflets are available in several languages and can be downloaded from our website www.allafrance.com

In the hope that this new support will permit our companies to increase our market share, we stay at your disposal for any additional information you may require.

With best regards,
**ALLA FRANCE**
Sales Department
sales@allafrance.com

# Instrumentation

FOR LABORATORIES & INDUSTRY

# CATALOGUE

# SECTIONS



# HOW TO CONTACT US ?

**Our structure enables us to respond rapidly to all types of questions, according to your geographical areas**

Choose the most convenient way to place your order, based on the degree of urgency:

## by E-mail

### French area
Speaking French ..... vente@allafrance.com

### English area
Speaking English & Spanish
Sales manager ..... E.Cullens@allafrance.com
Commercial assistant ..... sales@allafrance.com

### Latin area
Speaking Spanish, Italian, Portuguese & English
Sales manager ..... S.Rubini@allafrance.com
Commercial assistant ..... ventas@allafrance.com

### Eastern Europe countries
Speaking English ..... east@allafrance.com

### Production manager
Metrology questions ..... help@allafrance.com

### CRM/Product support
Client relationship ..... C.Froger@allafrance.com

### Logistic department ..... logistic@allafrance.com

### Account department ..... V.Olivier@allafrance.com

## by Phone

If you wish to verify the lead time of an article, contact us at:

**+33 Ø2 4130 5508**

## by Fax

In order to handle your order rapidly at:

**+33 Ø2 4130 3467**

## by Post

Send your purchase order to:

**ALLA FRANCE**
**ZI du Bompas**
**49120 Chemillé** (FRANCE)

# ALLA FRANCE
# HISTORY

In the eighteenth & nineteenth century our company was already manufacturing measuring instruments, and had the good fortune to count as clients, scientific pioneers such as Mr. Goethe (1749-1832) and Mr. Réaumur (1683-1757).

During the twentieth century, despite two world wars, the company progressively evolved from an artisanal workshop to an industrial manufacturer, by investing in special machines, usually developed on-site.

Between the years of 1970 and 1980, as our competitors were concerned with reducing production in favour of buying an increasing number of products from Asia, ALLA FRANCE decided on the opposite approach, by investing regularly in production equipment.

- In 1988, we chose to leave our Paris location in order to relocate to Chemillé (300 km south west of Paris – 90 minutes by high speed train). During the last 22 years, we have tripled our production surface area. We produce in a modern, custom-built factory, responding perfectly to our needs.
  The manufacturing strategy, in which we placed our confidence now enables us to offer affordable high-quality instruments, thus increasing exportation to 80 countries on the world.
- Our long-standing experience has been a continual collaboration between know-how and modernity.
  This experience involves assured principles, a competent staff and regular investments in Research and Development, which account for more than 5% of our turnover.
  Moreover, the company is still principally led by our Managing Director Jean-Marc ALLA, which is not only a guarantee of independence, but also of maintaining our development strategy. This coherence and stability preserve in the long term our strong industrial vocation.
  In spite of the family like nature of our company, a business plan exists which has been studied and reviewed by a staff with various skills and nationalities, and whose contributions enable us to form our decisions according to diverse sensitivities and requirements.

# ENVIRONMENT AND QUALITY OF WORK

**"Our children's world, is the world which we prepare for them today"**

CLEAN PRODUCTS
CLEAN FACTORY

For us, the subject of the Environment is not merely an opportune manner of doing business. The Environment signifies more for us and is a philosophical perspective in harmony with the quality of living.

- **Our thermometers without mercury**
  This sentiment, above all, is what you will experience and what will contribute to your decision in taking interest in our line of "environmentally friendly" products. When consulting the catalogue section dedicated to our BIOTEMP thermometers, you can see that they already respond to many applications.
- **Our lead free hydrometers**
  Despite regulations still authorizing the use of lead in ballast hydrometers, and given the dangers it poses, we chose to eliminate its use. Ballast instruments which contain lead or similar alloys are no longer manufactured in our workshops.
- **Accident prevention at work**
  Even though our production site entails minimal need for this obligation, we have adopted a system of work risk prevention and of waste sorting and reprocessing.
- **Quality of work**
  Ensuring a safe, clean and happy workplace is one of our main concerns, and the foundation on which we have built our employee engagement.
- **Catalogue** printed on paper containing 60% post consumer recycled fiber and 40% **FSC** fiber (Forest Stewardship Council)

MIX Paper FSC® C043808

a view of our offices

# INDUSTRIAL FIELDS & CATALOGUES

## Our Industrial Fields

- Industrial laboratories
- Petroleum laboratories
- Educational
- Research centers
- Catering
- Food Industry
- Dairy industry
- Distilleries & Wine industry
- Farm produce
- Animal Husbandry
- Car accessories
- Refrigeration
- Air-conditioning
- Fishkeeping
- Photography
- Printing
- • •

## Our Specific leaflets

»» Digital instruments

»» Catering & Food Industry

»» Distilleries & Wine Industry

»» Refractometers

»» Fishkeeping

»» Batteries & Antifreeze

## Our brand names are protected around the world

France®

BIO TEMP®
Ecological line

Promo Lab® by France
Economic line

*french cooking by* France®
Catering line & food industry

# CALIBRATION & CERTIFICATES

## Traceable Calibration Certificates
**delivered by our laboratory**

**On request, all standardized instruments can be delivered with a Calibration Certificate with traceability guarantee.**


CERTIFICAT D'ETALONNAGE
CALIBRATION CERTIFICATE
N°. 7510

Each Traceable Certificate is registered in our data base with the following information: the standard or norm specification - the client's name the calibration date - the re-control date after 1 year - the calibration temperature - the immersion of the instrument - the individual instrument number - the individual certificate number - the Official Master used traceable to: **BNM-COFRAC, PTB-DAKKS/DKD, UKAS/NAMAS, NIST, GOST, INMETRO ...**
We control the instruments at 3 standard points.
Otherwise, you must mention the number of points of control required, as well as the temperatures at which the tests are to be performed.

- **The thermometer** is calibrated in thermostated baths in comparison with a standard.
- **The hydrometer** is calibrated in comparison with a standard of the same sensitivity and the same diameter, in a homogeneous liquid of constant temperature.

**Our quality system allows us to produce calibration according to EN - ISO 9000 and our method follows the guide ISO 17 025.**

Standards are connected to a National Calibration Channel of one of the signatories of the Mutual Recognition Multilateral Agreement MLA* as agreed by the EA* (European cooperation of Accreditation).
The traceability of our standardization is recognized by the signatories of the MLA (Multilateral Agreement) and of the MRA (Mutual Recognition Arrangement) of ILAC. The reported expanded uncertainty of measurement corresponds to a coverage probability not less than 95%. Standard uncertainties were calculated according to ISO GUM (Guide for the Uncertainty Measurement).

**OUR MASTERS**

**Thermometers**

**MRA/ILAC** (COFRAC-DAKKS/DKD UKAS/NAMAS...)
9712

**NIST** (USA)
65007051707

**GOST** (Russia)
65007040653

**Hydrometers**

**MRA/ILAC** (COFRAC - DAKKS/DKD - UKAS/NAMAS...) **A2LA** (U.S.A.)

| | | | | | | | | | | | | | **GOST** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 17 | 5846 | 5854 | 5861 | 8312 | 24934 | 037592 | 061260 | 070321 | 070372 | 793793 | 893893 | 39021-08 |
| 7 | 18 | 5848 | 5855 | 8306 | 8313 | 24939 | 037840 | 061283 | 070327 | 070851 | 793800 | 904666 | 39022-08 |
| 9 | 15 | 5849 | 5856 | 8307 | 8314 | 010561 | 038745 | 061741 | 070329 | 071187 | 804525 | 904671 | |
| 10 | 5842 | 5850 | 5857 | 8308 | 8315 | 018584 | 039055 | 062858 | 070333 | 706662 | 804538 | 904674 | |
| 12 | 5843 | 5851 | 5858 | 8309 | 8316 | 024649 | 050012 | 063410 | 070339 | 706984 | 805377 | 993994 | |
| 13 | 5844 | 5852 | 5859 | 8310 | 8317 | 024650 | 057381 | 070276 | 070342 | 708304 | 893893 | 993996 | |
| 16 | 5845 | 5853 | 5860 | 8311 | 8318 | 037131 | 057852 | 070277 | 070358 | 793793 | 893893 | | |

(*) Masters number updated to 01/03/2010

**TRACEABILITY**

| INSTRUMENT ORDERED | ALLA FRANCE DATABASE |
|---|---|
| Individual N°on the instrument → | N. → |
| Individual N°on the Certificate → | N. → |
| Individual N°on the Official Master → | N. → |

**OFFICIAL MASTERS**
**Traceability guarantee**
PTB-DAKKS/DKD - UKAS/NAMAS
BNM-COFRAC
A2LA-NIST-GOST-INMETRO

(*) MLA-EA: to know the list of the countries signatories to the 01/03/10, see following page


### RE-CALIBRATION - SOLIDITY OF PACKING

All the instruments with Traceable Calibration Certificate are provided in a solid box, and they can be re-calibrated in our laboratory after 1 year.
To be informed of this service, please return us the "Bulletin of Traceability" delivered with the instrument duly filled in.

For more information on the EA, MRA, ILAC countries signatories visit:
http://www.european-accreditation.org and http://www.ilac.org

**Signatories of the Multilateral Agreement EA**

| | |
|---|---|
| AUSTRIA | :BMwA |
| BELGIUM | :BELAC |
| CZECH REPUBLIC | :CAI |
| CROATIA | :HAA |
| DENMARK | :DANAK |
| ESTONIA | :EAK |
| FINLAND | :FINAS |
| FRANCE | :COFRAC |
| GERMANY | :DAKKS/DKD |
| GREECE | :ESYD |
| HUNGARY | :NAT |
| IRELAND | :INAB |
| ITALY | :COPA/SIT |
| LATVIA | :LATAK |
| LITHUANIA | :LA |
| NORWAY | :NA |
| NETHERLANDS | :RvA |
| POLAND | :PCA |
| PORTUGAL | :IPAC |
| ROMANIA | :RENAR |
| SLOVAKIA | :SNAS |
| SLOVENIA | :SA |
| SPAIN | :ENAC |
| SWEDEN | :SWEDAC |
| SWITZERLAND | :SAS |
| TURKEY | :TURKAK |
| UNITED KINGDOM | :UKAS/NAMAS |

**Signatories of Bilateral Agreements**

| | |
|---|---|
| AUSTRALIA | : NATA |
| BRAZIL | : CGCRE/INMETRO |
| HONG KONG | : HKAS |
| ISRAËL | : ISRAC |
| NEWZEALAND | : IANZ |
| SINGAPORE | : SAC |
| SOUTH AFRICA | : SANAS |
| TUNISIE | : TUNAC |

**Signatories to the Mutual Recognition Arrangement ILAC**

| | |
|---|---|
| ARGENTINA | : OAA |
| AUSTRALIA | : NATA |
| AUSTRIA | : BMwA |
| BELGIUM | : BELAC |
| BRAZIL | : CGCRE/INMETRO |
| CANADA | : SCC |
| COSTA RICA | : ECA |
| CUBA | : ONARC |
| CZECH REPUBLIC | : CAI |
| DENMARK | : DANAK |
| EGYPT | : EGAC |
| FINLAND | : FINAS |
| FRANCE | : COFRAC |
| GERMANY | : DAKKS/DKD |
| GREECE | : ESYD |
| HONG-KONG, CHINA | : HKAS |
| HUNGARY | : NAT |
| INDIA | : NABL |
| INDONESIA | : KAN |
| IRELAND | : INAB |
| ISRAËL | : ISRAC |
| ITALY | : COPA/SIT |
| JAPÄN | : JAB, IA, JAPAN |
| MALAYSIA | : DSM |
| MEXICO | : EMA |
| NETHERLANDS | : RvA |
| NEWZEALAND | : IANZ |
| NORWAY | : NA |
| PAKISTAN | : PNAC |
| PHILIPPINES | : PAO |
| POLAND | : PCA |
| PORTUGAL | : IPAC |
| REP OF KOREA | : KOLAS |
| ROMANIA | : RENAR |
| SINGAPORE | : SAC |
| SLOVAKIA | : SNAS |
| SLOVENIA | : SA |
| SOUTH AFRICA | : SANAS |
| SPAIN | : ENAC |
| SWEDEN | : SWEDAC |
| SWITZERLAND | : SAS |
| TAÏPEI | : TAF |
| THAILAND | : NSC - ONAC |
| TUNISIE | : TUNAC |
| TURKEY | : TURKAK |
| UEA | : DAC |
| UNITED KINGDOM | : UKAS/NAMAS |
| USA | : NIST, A2LA, N VLAP, ACLASS, IAS, L-A-B, PJLA |
| VIETNAM | : BoA |

**EA** = European co-operation for Accreditation
**ILAC** = International Laboratory Accreditation Cooperation
**MRA** = Mutual Recognition Arrangement

## EO Official Certificates
### by an Accredited European Laboratory

### OFFICIAL CALIBRATION CERTIFICATE

**On request, all the standardized instruments can be delivered with an Official Calibration Certificate.**
Unless otherwise stipulated on your purchase order, we reserve the right to choose the Official Laboratory which can propose the shortest delay.
If nothing else is stipulated, we control the instruments at 3 standard temperature points. Otherwise, you must mention the number of points of control required, as well as the temperatures at which the tests are to be performed.

### OFFICIAL VERIFICATION CERTIFICATE

**The High Precision Alcoholometers according to OIML** can be delivered with an **Official Verification Certificate**.
This certificate indicate that the issue of a verification report bearing the COFRAC calibration logo guarantees the traceability of calibration measurements to the international System of Units SI. The errors of indication of this instrument are lower than the maximum permissible value equal to 0,1% Vol.

## CC Other Certificates


### TRACEABILITY AND CONFORMITY CERTIFICATE

All Alla France Standardized Thermometers and Hydrometers are systematically delivered with a Traceability and Conformity Certificate connected to the principal International Chains of Calibration.

### TRACEABILITY AND PRECISION CERTIFICATE

All Alla France Precision Thermometers are systematically delivered with a Certificate of Precision and Traceability connected to the principal International Chains of Calibration.

# CONVERSION TABLE


## Thermometers

| °C | Degrees | °F | °C | Degrees | °F | °C | Degrees | °F | °C | Degrees | °F | °C | Degrees | °F | °C | Degrees | °F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -167.8 | -270 | -454.0 | -28.3 | -19 | -2.2 | 18.9 | 66 | 150.8 | 66.1 | 151 | 303.8 | 113.3 | 236 | 456.8 | 200.0 | 392 | 737.6 |
| -165.0 | -265 | -445.0 | -27.8 | -18 | -0.4 | 19.4 | 67 | 152.6 | 66.7 | 152 | 305.6 | 113.9 | 237 | 458.6 | 201.1 | 394 | 741.2 |
| -162.2 | -260 | -436.0 | -27.2 | -17 | 1.4 | 20.0 | 68 | 154.4 | 67.2 | 153 | 307.4 | 114.4 | 238 | 460.4 | 202.2 | 396 | 744.8 |
| -159.4 | -255 | -427.0 | -26.7 | -16 | 3.2 | 20.6 | 69 | 156.2 | 67.8 | 154 | 309.2 | 115.0 | 239 | 462.2 | 203.3 | 398 | 748.4 |
| -156.7 | -250 | -418.0 | -26.1 | -15 | 5.0 | 21.1 | 70 | 158.0 | 68.3 | 155 | 311.0 | 115.6 | 240 | 464.0 | 204.4 | 400 | 752.0 |
| -153.9 | -245 | -409.0 | -25.6 | -14 | 6.8 | 21.7 | 71 | 159.8 | 68.9 | 156 | 312.8 | 116.1 | 241 | 465.8 | 205.6 | 402 | 755.6 |
| -151.1 | -240 | -400.0 | -25.0 | -13 | 8.6 | 22.2 | 72 | 161.6 | 69.4 | 157 | 314.6 | 116.7 | 242 | 467.6 | 206.7 | 404 | 759.2 |
| -148.3 | -235 | -391.0 | -24.4 | -12 | 10.4 | 22.8 | 73 | 163.4 | 70.0 | 158 | 316.4 | 117.2 | 243 | 469.4 | 207.8 | 406 | 762.8 |
| -145.6 | -230 | -382.0 | -23.9 | -11 | 12.2 | 23.3 | 74 | 165.2 | 70.6 | 159 | 318.2 | 117.8 | 244 | 471.2 | 208.9 | 408 | 766.4 |
| -142.8 | -225 | -373.0 | -23.3 | -10 | 14.0 | 23.9 | 75 | 167.0 | 71.1 | 160 | 320.0 | 118.3 | 245 | 473.0 | 210.0 | 410 | 770.0 |
| -140.0 | -220 | -364.0 | -22.8 | -9 | 15.8 | 24.4 | 76 | 168.8 | 71.7 | 161 | 321.8 | 118.9 | 246 | 474.8 | 211.1 | 412 | 773.6 |
| -137.2 | -215 | -355.0 | -22.2 | -8 | 17.6 | 25.0 | 77 | 170.6 | 72.2 | 162 | 323.6 | 119.4 | 247 | 476.6 | 212.2 | 414 | 777.2 |
| -134.4 | -210 | -346.0 | -21.7 | -7 | 19.4 | 25.6 | 78 | 172.4 | 72.8 | 163 | 325.4 | 120.0 | 248 | 478.4 | 213.3 | 416 | 780.8 |
| -131.7 | -205 | -337.0 | -21.1 | -6 | 21.2 | 26.1 | 79 | 174.2 | 73.3 | 164 | 327.2 | 120.6 | 249 | 480.2 | 214.4 | 418 | 784.4 |
| -128.9 | -200 | -328.0 | -20.6 | -5 | 23.0 | 26.7 | 80 | 176.0 | 73.9 | 165 | 329.0 | 121.1 | 250 | 482.0 | 215.6 | 420 | 788.0 |
| -126.1 | -195 | -319.0 | -20.0 | -4 | 24.8 | 27.2 | 81 | 177.8 | 74.4 | 166 | 330.8 | 122.2 | 252 | 485.6 | 216.7 | 422 | 791.6 |
| -123.3 | -190 | -310.0 | -19.4 | -3 | 26.6 | 27.8 | 82 | 179.6 | 75.0 | 167 | 332.6 | 123.3 | 254 | 489.2 | 217.8 | 424 | 795.2 |
| -120.6 | -185 | -301.0 | -18.9 | -2 | 28.4 | 28.3 | 83 | 181.4 | 75.6 | 168 | 334.4 | 124.4 | 256 | 492.8 | 218.9 | 426 | 798.8 |
| -117.8 | -180 | -292.0 | -18.3 | -1 | 30.2 | 28.9 | 84 | 183.2 | 76.1 | 169 | 336.2 | 125.6 | 258 | 496.4 | 220.0 | 428 | 802.4 |
| -115.0 | -175 | -283.0 | -17.8 | 0 | 32.0 | 29.4 | 85 | 185.0 | 76.7 | 170 | 338.0 | 126.7 | 260 | 500.0 | 221.1 | 430 | 806.0 |
| -112.2 | -170 | -274.0 | -17.2 | 1 | 33.8 | 30.0 | 86 | 186.8 | 77.2 | 171 | 339.8 | 127.8 | 262 | 503.6 | 222.2 | 432 | 809.6 |
| -109.4 | -165 | -265.0 | -16.7 | 2 | 35.6 | 30.6 | 87 | 188.6 | 77.8 | 172 | 341.6 | 128.9 | 264 | 507.2 | 223.3 | 434 | 813.2 |
| -106.7 | -160 | -256.0 | -16.1 | 3 | 37.4 | 31.1 | 88 | 190.4 | 78.3 | 173 | 343.4 | 130.0 | 266 | 510.8 | 224.4 | 436 | 816.8 |
| -103.9 | -155 | -247.0 | -15.6 | 4 | 39.2 | 31.7 | 89 | 192.2 | 78.9 | 174 | 345.2 | 131.1 | 268 | 514.4 | 225.6 | 438 | 820.4 |
| -101.1 | -150 | -238.0 | -15.0 | 5 | 41.0 | 32.2 | 90 | 194.0 | 79.4 | 175 | 347.0 | 132.2 | 270 | 518.0 | 226.7 | 440 | 824.0 |
| -98.3 | -145 | -229.0 | -14.4 | 6 | 42.8 | 32.8 | 91 | 195.8 | 80.0 | 176 | 348.8 | 133.3 | 272 | 521.6 | 227.8 | 442 | 827.6 |
| -95.6 | -140 | -220.0 | -13.9 | 7 | 44.6 | 33.3 | 92 | 197.6 | 80.6 | 177 | 350.6 | 134.4 | 274 | 525.2 | 228.9 | 444 | 831.2 |
| -92.8 | -135 | -211.0 | -13.3 | 8 | 46.4 | 33.9 | 93 | 199.4 | 81.1 | 178 | 352.4 | 135.6 | 276 | 528.8 | 230.0 | 446 | 834.8 |
| -90.0 | -130 | -202.0 | -12.8 | 9 | 48.2 | 34.4 | 94 | 201.2 | 81.7 | 179 | 354.2 | 136.7 | 278 | 532.4 | 231.1 | 448 | 838.4 |
| -87.2 | -125 | -193.0 | -12.2 | 10 | 50.0 | 35.0 | 95 | 203.0 | 82.2 | 180 | 356.0 | 137.8 | 280 | 536.0 | 232.2 | 450 | 842.0 |
| -84.4 | -120 | -184.0 | -11.7 | 11 | 51.8 | 35.6 | 96 | 204.8 | 82.8 | 181 | 357.8 | 138.9 | 282 | 539.6 | 233.3 | 452 | 845.6 |
| -81.7 | -115 | -175.0 | -11.1 | 12 | 53.6 | 36.1 | 97 | 206.6 | 83.3 | 182 | 359.6 | 140.0 | 284 | 543.2 | 234.4 | 454 | 849.2 |
| -78.9 | -110 | -166.0 | -10.6 | 13 | 55.4 | 36.7 | 98 | 208.4 | 83.9 | 183 | 361.4 | 141.1 | 286 | 546.8 | 235.6 | 456 | 852.8 |
| -76.1 | -105 | -157.0 | -10.0 | 14 | 57.2 | 37.2 | 99 | 210.2 | 84.4 | 184 | 363.2 | 142.2 | 288 | 550.4 | 236.7 | 458 | 856.4 |
| -73.3 | -100 | -148.0 | -9.4 | 15 | 59.0 | 37.8 | 100 | 212.0 | 85.0 | 185 | 365.0 | 143.3 | 290 | 554.0 | 237.8 | 460 | 860.0 |
| -72.2 | -98 | -144.4 | -8.9 | 16 | 60.8 | 38.3 | 101 | 213.8 | 85.6 | 186 | 366.8 | 144.4 | 292 | 557.6 | 238.9 | 462 | 863.6 |
| -71.1 | -96 | -140.8 | -8.3 | 17 | 62.6 | 38.9 | 102 | 215.6 | 86.1 | 187 | 368.6 | 145.6 | 294 | 561.2 | 240.0 | 464 | 867.2 |
| -70.0 | -94 | -137.2 | -7.8 | 18 | 64.4 | 39.4 | 103 | 217.4 | 86.7 | 188 | 370.4 | 146.7 | 296 | 564.8 | 241.1 | 466 | 870.8 |
| -68.9 | -92 | -133.6 | -7.2 | 19 | 66.2 | 40.0 | 104 | 219.2 | 87.2 | 189 | 372.2 | 147.8 | 298 | 568.4 | 242.2 | 468 | 874.4 |
| -67.8 | -90 | -130.0 | -6.7 | 20 | 68.0 | 40.6 | 105 | 221.0 | 87.8 | 190 | 374.0 | 148.9 | 300 | 572.0 | 243.3 | 470 | 878.0 |
| -66.7 | -88 | -126.4 | -6.1 | 21 | 69.8 | 41.1 | 106 | 222.8 | 88.3 | 191 | 375.8 | 150.0 | 302 | 575.6 | 244.4 | 472 | 881.6 |
| -65.6 | -86 | -122.8 | -5.6 | 22 | 71.6 | 41.7 | 107 | 224.6 | 88.9 | 192 | 377.6 | 151.1 | 304 | 579.2 | 245.6 | 474 | 885.2 |
| -64.4 | -84 | -119.2 | -5.0 | 23 | 73.4 | 42.2 | 108 | 226.4 | 89.4 | 193 | 379.4 | 152.2 | 306 | 582.8 | 246.7 | 476 | 888.8 |
| -63.3 | -82 | -115.6 | -4.4 | 24 | 75.2 | 42.8 | 109 | 228.2 | 90.0 | 194 | 381.2 | 153.3 | 308 | 586.4 | 247.8 | 478 | 892.4 |
| -62.2 | -80 | -112.0 | -3.9 | 25 | 77.0 | 43.3 | 110 | 230.0 | 90.6 | 195 | 383.0 | 154.4 | 310 | 590.0 | 248.9 | 480 | 896.0 |
| -61.1 | -78 | -108.4 | -3.3 | 26 | 78.8 | 43.9 | 111 | 231.8 | 91.1 | 196 | 384.8 | 155.6 | 312 | 593.6 | 250.0 | 482 | 899.6 |
| -60.0 | -76 | -104.8 | -2.8 | 27 | 80.6 | 44.4 | 112 | 233.6 | 91.7 | 197 | 386.6 | 156.7 | 314 | 597.2 | 251.1 | 484 | 903.2 |
| -58.9 | -74 | -101.2 | -2.2 | 28 | 82.4 | 45.0 | 113 | 235.4 | 92.2 | 198 | 388.4 | 157.8 | 316 | 600.8 | 252.2 | 486 | 906.8 |
| -57.8 | -72 | -97.6 | -1.7 | 29 | 84.2 | 45.6 | 114 | 237.2 | 92.8 | 199 | 390.2 | 158.9 | 318 | 604.4 | 253.3 | 488 | 910.4 |
| -56.7 | -70 | -94.0 | -1.1 | 30 | 86.0 | 46.1 | 115 | 239.0 | 93.3 | 200 | 392.0 | 160.0 | 320 | 608.0 | 254.4 | 490 | 914.0 |
| -55.6 | -68 | -90.4 | -0.6 | 31 | 87.8 | 46.7 | 116 | 240.8 | 93.9 | 201 | 393.8 | 161.1 | 322 | 611.6 | 255.6 | 492 | 917.6 |
| -54.4 | -66 | -86.8 | 0.0 | 32 | 89.6 | 47.2 | 117 | 242.6 | 94.4 | 202 | 395.6 | 162.2 | 324 | 615.2 | 256.7 | 494 | 921.2 |
| -53.3 | -64 | -83.2 | 0.6 | 33 | 91.4 | 47.8 | 118 | 244.4 | 95.0 | 203 | 397.4 | 163.3 | 326 | 618.8 | 257.8 | 496 | 924.8 |
| -52.2 | -62 | -79.6 | 1.1 | 34 | 93.2 | 48.3 | 119 | 246.2 | 95.6 | 204 | 399.2 | 164.4 | 328 | 622.4 | 258.9 | 498 | 928.4 |
| -51.1 | -60 | -76.0 | 1.7 | 35 | 95.0 | 48.9 | 120 | 248.0 | 96.1 | 205 | 401.0 | 165.6 | 330 | 626.0 | 260.0 | 500 | 932.0 |
| -50.0 | -58 | -72.4 | 2.2 | 36 | 96.8 | 49.4 | 121 | 249.8 | 96.7 | 206 | 402.8 | 166.7 | 332 | 629.6 | 261.1 | 502 | 935.6 |
| -48.9 | -56 | -68.8 | 2.8 | 37 | 98.6 | 50.0 | 122 | 251.6 | 97.2 | 207 | 404.6 | 167.8 | 334 | 633.2 | 262.2 | 504 | 939.2 |
| -47.8 | -54 | -65.2 | 3.3 | 38 | 100.4 | 50.6 | 123 | 253.4 | 97.8 | 208 | 406.4 | 168.9 | 336 | 636.8 | 263.3 | 506 | 942.8 |
| -46.7 | -52 | -61.6 | 3.9 | 39 | 102.2 | 51.1 | 124 | 255.2 | 98.3 | 209 | 408.2 | 170.0 | 338 | 640.4 | 264.4 | 508 | 946.4 |
| -45.6 | -50 | -58.0 | 4.4 | 40 | 104.0 | 51.7 | 125 | 257.0 | 98.9 | 210 | 410.0 | 171.1 | 340 | 644.0 | 265.6 | 510 | 950.0 |
| -44.4 | -48 | -54.4 | 5.0 | 41 | 105.8 | 52.2 | 126 | 258.8 | 99.4 | 211 | 411.8 | 172.2 | 342 | 647.6 | 266.7 | 512 | 953.6 |
| -43.3 | -46 | -50.8 | 5.6 | 42 | 107.6 | 52.8 | 127 | 260.6 | 100.0 | 212 | 413.6 | 173.3 | 344 | 651.2 | 267.8 | 514 | 957.2 |
| -42.2 | -44 | -47.2 | 6.1 | 43 | 109.4 | 53.3 | 128 | 262.4 | 100.6 | 213 | 415.4 | 174.4 | 346 | 654.8 | 268.9 | 516 | 960.8 |
| -41.1 | -42 | -43.6 | 6.7 | 44 | 111.2 | 53.9 | 129 | 264.2 | 101.1 | 214 | 417.2 | 175.6 | 348 | 658.4 | 270.0 | 518 | 964.4 |
| -40.0 | -40 | -40.0 | 7.2 | 45 | 113.0 | 54.4 | 130 | 266.0 | 101.7 | 215 | 419.0 | 176.7 | 350 | 662.0 | 271.1 | 520 | 968.0 |
| -39.4 | -39 | -38.2 | 7.8 | 46 | 114.8 | 55.0 | 131 | 267.8 | 102.2 | 216 | 420.8 | 177.8 | 352 | 665.6 | 272.2 | 522 | 971.6 |
| -38.9 | -38 | -36.4 | 8.3 | 47 | 116.6 | 55.6 | 132 | 269.6 | 102.8 | 217 | 422.6 | 178.9 | 354 | 669.2 | 273.3 | 524 | 975.2 |
| -38.3 | -37 | -34.6 | 8.9 | 48 | 118.4 | 56.1 | 133 | 271.4 | 103.3 | 218 | 424.4 | 180.0 | 356 | 672.8 | 274.4 | 526 | 978.8 |
| -37.8 | -36 | -32.8 | 9.4 | 49 | 120.2 | 56.7 | 134 | 273.2 | 103.9 | 219 | 426.2 | 181.1 | 358 | 676.4 | 275.6 | 528 | 982.4 |
| -37.2 | -35 | -31.0 | 10.0 | 50 | 122.0 | 57.2 | 135 | 275.0 | 104.4 | 220 | 428.0 | 182.2 | 360 | 680.0 | 276.7 | 530 | 986.0 |
| -36.7 | -34 | -29.2 | 10.6 | 51 | 123.8 | 57.8 | 136 | 276.8 | 105.0 | 221 | 429.8 | 183.3 | 362 | 683.6 | 277.8 | 532 | 989.6 |
| -36.1 | -33 | -27.4 | 11.1 | 52 | 125.6 | 58.3 | 137 | 278.6 | 105.6 | 222 | 431.6 | 184.4 | 364 | 687.2 | 278.9 | 534 | 993.2 |
| -35.6 | -32 | -25.6 | 11.7 | 53 | 127.4 | 58.9 | 138 | 280.4 | 106.1 | 223 | 433.4 | 185.6 | 366 | 690.8 | 280.0 | 536 | 996.8 |
| -35.0 | -31 | -23.8 | 12.2 | 54 | 129.2 | 59.4 | 139 | 282.2 | 106.7 | 224 | 435.2 | 186.7 | 368 | 694.4 | 281.1 | 538 | 1000.4 |
| -34.4 | -30 | -22.0 | 12.8 | 55 | 131.0 | 60.0 | 140 | 284.0 | 107.2 | 225 | 437.0 | 187.8 | 370 | 698.0 | 282.2 | 540 | 1004.0 |
| -33.9 | -29 | -20.2 | 13.3 | 56 | 132.8 | 60.6 | 141 | 285.8 | 107.8 | 226 | 438.8 | 188.9 | 372 | 701.6 | 285.0 | 545 | 1013.0 |
| -33.3 | -28 | -18.4 | 13.9 | 57 | 134.6 | 61.1 | 142 | 287.6 | 108.3 | 227 | 440.6 | 190.0 | 374 | 705.2 | 287.8 | 550 | 1022.0 |
| -32.8 | -27 | -16.6 | 14.4 | 58 | 136.4 | 61.7 | 143 | 289.4 | 108.9 | 228 | 442.4 | 191.1 | 376 | 708.8 | 290.6 | 555 | 1031.0 |
| -32.2 | -26 | -14.8 | 15.0 | 59 | 138.2 | 62.2 | 144 | 291.2 | 109.4 | 229 | 444.2 | 192.2 | 378 | 712.4 | 293.3 | 560 | 1040.0 |
| -31.7 | -25 | -13.0 | 15.6 | 60 | 140.0 | 62.8 | 145 | 293.0 | 110.0 | 230 | 446.0 | 193.3 | 380 | 716.0 | 296.1 | 565 | 1049.0 |
| -31.1 | -24 | -11.2 | 16.1 | 61 | 141.8 | 63.3 | 146 | 294.8 | 110.6 | 231 | 447.8 | 194.4 | 382 | 719.6 | 298.9 | 570 | 1058.0 |
| -30.6 | -23 | -9.4 | 16.7 | 62 | 143.6 | 63.9 | 147 | 296.6 | 111.1 | 232 | 449.6 | 195.6 | 384 | 723.2 | 301.7 | 575 | 1067.0 |
| -30.0 | -22 | -7.6 | 17.2 | 63 | 145.4 | 64.4 | 148 | 298.4 | 111.7 | 233 | 451.4 | 196.7 | 386 | 726.8 | 304.4 | 580 | 1076.0 |
| -29.4 | -21 | -5.8 | 17.8 | 64 | 147.2 | 65.0 | 149 | 300.2 | 112.2 | 234 | 453.2 | 197.8 | 388 | 730.4 | 307.2 | 585 | 1085.0 |
| -28.9 | -20 | -4.0 | 18.3 | 65 | 149.0 | 65.6 | 150 | 302.0 | 112.8 | 235 | 455.0 | 198.9 | 390 | 734.0 | 310.0 | 590 | 1094.0 |

**How to convert °C to °F and vice-versa**

$$°F = 32 + (1.8 \times °C) \qquad °C = \frac{°F - 32}{1.8}$$

# THERMOMETERS

# IMMERSIONS


**If a thermometer is not used with the same immersion for which it was calibrated, it is necessary to make a correction:**

## HOW TO CONVERT TOTAL IMMERSION INTO PARTIAL IMMERSION ?

In some cases, it is not possible to immerse a total immersion thermometer to the summit of the liquid column. Therefore a measure error will occur due to the part of the liquid column that is not immersed. In the case of mercury, the emergent column correction C1 can be calculated with an accuracy of approximately 10% by using the formula:

$$C1 = k\,N\,(t1-t)$$

k is a coefficient having for value $0.00016°C^{-1}$.
In the case of thermometers filled with red or blue liquid, the value of k varies according to the temperature. As a first approximation, use $0.001°C^{-1}$. N is the number of degrees Celsius equivalent to the length of the emergent liquid column.
(t1-t) is the difference between the temperature t1 of the reservoir of the thermometer and the average temperature t of the emergent column.

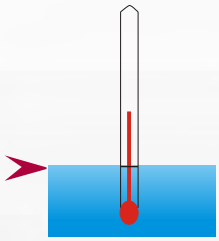
**Example:** a thermometer is immersed up to the 70°C graduation, whereas the column of liquid reaches the 100°C graduate. In this case, N equals 30°C (100-70).
If the temperature t1 of the reservoir of the thermometer is 100°C and the average temperature t of the emergent column is 58°C, the correction then becomes:
C1 = 0.00016 x 30 x (100-58) = + 0.2°C

## HOW TO CONVERT PARTIAL IMMERSION INTO TOTAL IMMERSION ?

The correction of immersed column, C2 can be calculated with an accuracy of approximately 10% from the formula: $C2 = k\,(t2-t3)\,(t4-t5)$
In the case of mercury, k is a coefficient having for value $0.00016°C^{-1}$.
In the case of thermometers filled with red or blue liquid, the value of k varies according to the temperature. As a first approximation, use $0.001°C^{-1}$.
t2 corresponds to the reading at the immersion depth the thermometer is being used at.
t3 is the extrapolated temperature which corresponds to the level of immersion indicated.
t4 is the temperature as indicated in the following table.
t5 is the average temperature of the immersed column.

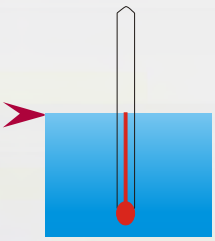
| Reading temp. | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 250 |
|---|---|---|---|---|---|---|---|---|---|---|
| t4 | 30 | 35 | 43 | 47 | 54 | 60 | 67 | 75 | 84 | 95 |

**Example:** the thermometer is immersed to the t2 graduation : 80°C .
The thermometer is calibrated for a partial immersion of 76 mm.
The extrapolated temperature for the instrument at 76 mm immersion is t3= -17°C.
The temperature reading being 80°C, according to the table, t4 = 35°C.
The temperature reading being 80°C, one can assume that the average temperature of the immersed column t5 is the same. So t5 = 80°C. The correction then becomes:
C1 = 0.00016 x (80-(-17)) x (35-80) = - 0.7°C



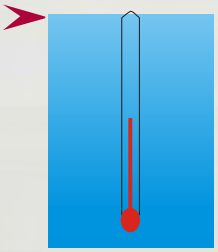
**PARTIAL IMMERSION**

The thermometer is calibrated to be partially immersed, to a depth of 76 mm (75 for ISO). If the thermometer is used at a different immersion, an emergent column correction must be made.



**TOTAL IMMERSION**

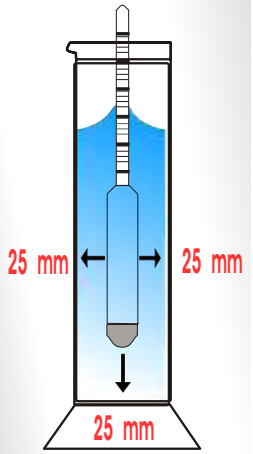
The thermometer must be immersed to the same level as the temperature reading.



**COMPLETE IMMERSION**

Very rarely used.
The thermometer is completely immersed in the liquid.

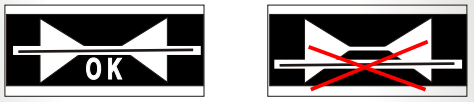
# HOW TO USE YOUR HYDROMETER




The test jar must be kept vertical, and the liquid to be tested at a temperature as close as possible to that at which the hydrometer has been calibrated.

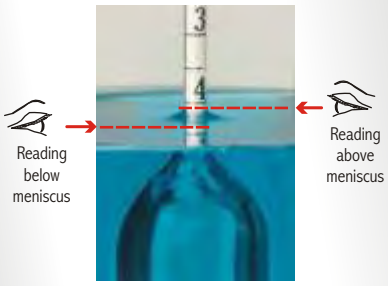
Ensure that the hydrometers and the liquid sample are free from grease and oil, etc. Hold the hydrometer vertically by the top of the stem and gently lower it into the liquid until it floats freely.

The standardized hydrometer possesses a **benchmark** which allows the user to notice any displacement of the scale inside the instrument.




Before use, verify that the line engraved on the stem is super-imposed on the reference line on the scale.

**The instrument should be used in a liquid of known surface tension and temperature.**




**The reading is taken below or above the meniscus according to the liquid used.**

# CORRESPONDENCES

## BAUMÉ/DENSITY CORRESPONDENCES

This unit of measure, obselete in most countries is still asked by certain industries or users.

### LIQUIDS LIGHTER THAN WATER

| BAUMÉ | g/ml |
|---|---|
| 10 | 1.000 |
| 20 | 0.933 |
| 30 | 0.875 |
| 40 | 0.824 |
| 50 | 0.778 |
| 60 | 0.737 |
| 70 | 0.700 |

140/(MV 60°F) - 130
or
140/(MV 15.6°C) - 130

$$°Bé = \frac{140}{(MV^* \ 60°F)} - 130$$
**or (MV* 15.6°C)**

* MV = DENSITY

### LIQUIDS HEAVIER THAN WATER

| BAUMÉ | g/ml |
|---|---|
| 0 | 1.000 |
| 10 | 1.074 |
| 20 | 1.160 |
| 30 | 1.261 |
| 40 | 1.381 |
| 50 | 1.526 |
| 60 | 1.706 |
| 70 | 1.933 |

145 - 145/(MV 60°F)
or
145 - 145/(MV 15.6°C)

$$°Bé = 145 - \frac{145}{(MV^* \ 60°F)}$$
**or (MV* 15.6°C)**

* MV = DENSITY

## TWADDLE/DENSITY CORRESPONDENCES

Twaddle expresses the degree of sugar content in a liquid from the following formula:

**[(SG 60/60°F)-1000] x 200**
where
**SG 60/60°F is the Specific Gravity 60/60°F**

## API/DENSITY CORRESPONDENCES

The °API is used for the petroleum products and satisfies the formula:

141.5/(SG 60/60°F) - 131.5

$$°API = \frac{141.5}{(SG \ 60/60°F^*)} - 131.5$$

* SG 60/60°F = Specific Gravity 60/60°F

## BRIX/DENSITY CORRESPONDENCES

| g/l 20°C | °BRIX 20°C | g/l 20°C | °BRIX 20°C |
|---|---|---|---|
| 998.2 | 0.0 | 1085.4 | 21.0 |
| 1002.1 | 1.0 | 1089.8 | 22.0 |
| 1005.9 | 2.0 | 1094.4 | 23.0 |
| 1009.9 | 3.0 | 1098.9 | 24.0 |
| 1013.8 | 4.0 | 1103.5 | 25.0 |
| 1017.8 | 5.0 | 1108.1 | 26.0 |
| 1021.8 | 6.0 | 1112.8 | 27.0 |
| 1025.8 | 7.0 | 1117.5 | 28.0 |
| 1029.9 | 8.0 | 1122.2 | 29.0 |
| 1034.0 | 9.0 | 1126.9 | 30.0 |
| 1038.1 | 10.0 | 1131.7 | 31.0 |
| 1042.2 | 11.0 | 1136.5 | 32.0 |
| 1046.4 | 12.0 | 1141.4 | 33.0 |
| 1050.6 | 13.0 | 1146.3 | 34.0 |
| 1054.8 | 14.0 | 1151.2 | 35.0 |
| 1059.1 | 15.0 | 1156.2 | 36.0 |
| 1063.4 | 16.0 | 1161.2 | 37.0 |
| 1067.7 | 17.0 | 1166.2 | 38.0 |
| 1072.1 | 18.0 | 1171.3 | 39.0 |
| 1076.5 | 19.0 | 1176.4 | 40.0 |
| 1080.9 | 20.0 | | |

# CORRECTIONS OF HYDROMETERS

## CORRECTION TEMPERATURE FOR DENSITY HYDROMETERS

**For hydrometers calibrated to a reference temperature at 20 °C** (68°F) **or 15 °C** (59°F).

If the hydrometer reading is taken at a temperature other than the standard temperature for the hydrometer, the reading will be in error due to the change in volume of the hydrometer between the two temperatures.

Appropriate corrections making allowance for this temperature effect are given in the table.

| Reference Temp. 20°C (68°F) | Reference Temp. 15°C (59°F) | hydrometer reading kg/m³ or $10^{-3}$ g/ml | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Temperature of Liquid °C | | kg/m³ | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| | | g/ml | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 |
| 0 | - | | +0.3 | +0.4 | +0.5 | +0.6 | +0.7 | +0.8 | +0.9 | +1.0 |
| 5 | 0 | | +0.2 | +0.3 | +0.4 | +0.5 | +0.5 | +0.6 | +0.7 | +0.8 |
| 10 | 5 | | +0.2 | +0.2 | +0.3 | +0.3 | +0.4 | +0.4 | +0.5 | +0.5 |
| 15 | 10 | | +0.1 | +0.1 | +0.1 | +0.2 | +0.2 | +0.2 | +0.2 | +0.3 |
| 20 | 15 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | 20 | | -0.1 | -0.1 | -0.1 | -0.2 | -0.2 | -0.2 | -0.2 | -0.3 |
| 30 | 25 | | -0.2 | -0.2 | -0.3 | -0.3 | -0.4 | -0.4 | -0.5 | -0.5 |
| 35 | 30 | | -0.2 | -0.3 | -0.5 | -0.5 | -0.5 | -0.6 | -0.7 | -0.8 |
| 40 | 35 | | -0.3 | -0.4 | -0.6 | -0.6 | -0.7 | -0.8 | -0.9 | -1.0 |
| 45 | 40 | | -0.4 | -0.5 | -0.8 | -0.8 | -0.9 | -1.0 | -1.1 | -1.3 |

These corrections when applied to the hydrometer reading at t °C give the density of the liquid in kg/m³ or g/ml at t °C.

## SURFACE TENSION OF THE HYDROMETERS (kg/m³ or $10^{-3}$ g/ml)

Reading of a hydrometer depends on the surface tension of the liquid in which it is used. This table gives an indication of possible errors, in the form of corrections which may be applied on account of difference between the surface tension of the liquid and the surface tension for which the hydrometer is graduated.

### Surface tension corrections

| The surface tension of liquid minus that for which the hydrometer is graduated (mN/m) | L20 Hydrometer reading kg/m³ | L20 g/ml | L50 & L50 SP Hydrometer reading kg/m³ | L50 & L50 SP g/ml | M50 & M50 SP Hydrometer reading kg/m³ | M50 & M50 SP g/ml | M100 Hydrometer reading kg/m³ | M100 g/ml | S50 & S50 SP Hydrometer reading kg/m³ | S50 & S50 SP g/ml |
|---|---|---|---|---|---|---|---|---|---|---|
| | 600 | 0.6 | 600 | 0.6 | 600 | 0.6 | 600 | 0.6 | 600 | 0.6 |
| | 1 000 | 1.0 | 1 000 | 1.0 | 1 000 | 1.0 | 1 000 | 1.0 | 1 000 | 1.0 |
| | 1 500 | 1.5 | 1 500 | 1.5 | 1 500 | 1.5 | 1 500 | 1.5 | 1 500 | 1.5 |
| | 2 000 | 2.0 | 2 000 | 2.0 | 2 000 | 2.0 | 2 000 | 2.0 | 2 000 | 2.0 |
| -40 | – | -0.54 | -0.45 | -0.39 | – | -1.2 | -0.9 | -0.8 | – | -1.9 | -1.5 | -1.4 | – | -3.0 | -3.0 | -2.0 | -3.0 | -2.5 | -2.0 | -2.0 |
| -30 | – | -0.41 | -0.34 | -0.30 | – | -0.9 | -0.7 | -0.6 | – | -1.4 | -1.1 | -1.0 | – | -2.0 | -2.0 | -2.0 | -2.5 | -2.0 | -1.5 | -1.5 |
| -20 | – | -0.27 | -0.22 | -0.20 | – | -0.6 | -0.5 | -0.4 | – | -0.9 | -0.8 | -0.7 | – | -2.0 | -1.0 | -1.0 | -1.5 | -1.5 | -1.0 | -1.0 |
| -10 | -0.18 | -0.14 | -0.11 | -0.10 | -0.3 | -0.3 | -0.2 | -0.2 | -0.6 | -0.5 | -0.4 | -0.3 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -0.5 | -0.5 | -0.5 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| +10 | +0.18 | +0.14 | +0.11 | +0.10 | +0.3 | +0.3 | +0.2 | +0.2 | +0.6 | +0.5 | +0.4 | +0.3 | +1.0 | +1.0 | +1.0 | +1.0 | +1.0 | +0.5 | +0.5 | +0.5 |
| +20 | – | +0.27 | +0.22 | +0.20 | – | +0.6 | +0.5 | +0.4 | – | +0.9 | +0.8 | +0.7 | – | +2.0 | +1.0 | +1.0 | +1.5 | +1.5 | +1.0 | +1.0 |
| +30 | – | +0.41 | +0.34 | +0.30 | – | +0.9 | +0.7 | +0.6 | – | +1.4 | +1.1 | +1.0 | – | +2.0 | +2.0 | +2.0 | +2.5 | +2.0 | +1.5 | +1.5 |
| +40 | – | +0.54 | +0.45 | +0.39 | – | +1.2 | +0.9 | +0.8 | – | +1.9 | +1.5 | +1.4 | – | +3.0 | +3.0 | +2.0 | +3.0 | +2.5 | +2.0 | +2.0 |

For hydrometers of different dimensions permitted under this specification the surface tension allowances may vary from the above amounts by up to approximately ±10%

### Examples of surface tension

| Category | kg/m³ Density | Surface tension mN/m 0 | 20 | 40 | 60 | 80 | Examples of liquids to which the category is appropriate |
|---|---|---|---|---|---|---|---|
| Low | 600 | 15 | 16 | 17 | 18 | 19 | Generally organic liquids (including ethers, petroleum distillates, coaltar distillates), and all types of oils aqueous solutions of low molecular mass organic substances. |
| | 700 | 20 | 21 | 22 | 23 | 24 | |
| | 800 | 25 | 26 | 27 | 28 | 29 | |
| | 900 | 30 | 31 | 32 | 33 | 34 | |
| | 1 000 to 1 300 | 35 | | | | | Acetic acid solutions, the free surfaces of which have not been specially cleaned. |
| Medium | 600 to 940 | 35 | | | | | Aqueous solutions of low molecular mass organic substances (including those of ethyl and methyl alcohol, but excluding acetic acid solutions), the free surfaces of which have been specially cleaned or not. |
| | 600 | 40 | | | | | |
| | 700 | 45 | | | | | |
| | 800 | 50 | | | | | |
| | 900 | | | | | | |
| | 1 000 to 2 000 | 55 | | | | | Nitric acid solutions of densities greater than 1300 kg/m³ or 1.3 g/ml whether the free surfaces have been specially cleaned or not. |
| High | 1 000 to 2 000 | 75 | | | | | Aqueous solutions, the surfaces of which have been specially cleaned, except: nitric acid of density greater than 1 300 kg/m³ and acetic acid solutions. |

Due to the extreme variability of the surface tension of acetic acid solutions, such solutions have not been included in the table.

# ETYMOLOGY

## HYDROMETER

from Greek: **"HUDÔR"**= water & **"METRON"**= measure

An instrument of measurement which functions based on Archimede's Principle. The reading is determined at the surface level of a liquid when the hydrometer floats freely. It is used for estimating the composition of a liquid or for preparing an identified liquid.
Among all of the units of measurement, the Voluminal mass (g/ml, Kg/l) is recommended by ISO.

## ALCOHOLOMETER

from Latin:**"ALKO(HO)L"** & from Greek: **"METRON"**= measure & from Arabic:**"AL-KUHL"** = pulverized antimony

Hydrometer measuring the alcohol content of liquids, specially calibrated for use with water/ethanol solutions. The official unit of measure is the % of Volume at 20 °C. Other less commonly used units exist: Tralles, Cartier, Gay Lussac, Richter, which you will find, as well, in our catalogue.

## SACCHAROMETER

from Latin: **"SACCARUM"** & from Greek: **"SAKKHAROS"**= sugar & **"METRON"**= measure

Hydrometer used to determine the proportion of sugar concentration in a solution. It is graduated in % MASS or weight of sugar in a water/sugar solution.

## THERMOMETER

from Greek: **"THERMOS"**= hot & **"METRON"**= measure

Instrument which measures temperature.
There are a large number of thermometers. The most simple rest on the fact that the substance dilates as the temperature increases: liquid filled thermometers (mercury, derived from oil or alcohol), or gas filled thermometers (helium).
These thermometers are composed of a liquid-filled glass reservoir linked with a glass capillary tube. A variation in temperature provokes a variation in the volume of the liquid, interpreted by a rise or descent of the liquid column inside the capillary.

## CALIBRATION

from Arabic: **"QÂLIB"** = form, moulde

The set of operations which establishes, under specified conditions, the relationship between values indicated by a measuring system, and the corresponding known values of a measurand.

## SOME NAMES OF INTEREST ...

**ARCHIMEDES** (287 - 212 B.C.)
The most well-known physicist in history who notably determined the push that a surrounding fluid exerts on a solid.

**BAUMÉ** (1728 - 1804)
French chemist, the basis on which was formed the graduated hydrometers in degrees Baumé. This unit of measure is no longer used in most countries today.

**CELCIUS** (1701 - 1744)
Swedish astronomist who made known the centesimal graduation of the thermometer.
Degree Celsius= °C

**FAHRENHEIT** (1686 - 1736)
Prussian physicist who gave his name to a scale of temperature. This scale is still used in Great Britain and North America.
0°C corresponds to 32°F and 100°C corresponds to 212°F.
You will find a conversion table °C / °F in our catalogue (pg 6).

**GALILEO** (1564 - 1642)
Italian physicist, mathematician and astronomer, founder of experiemental science and inventor of the Thermometer.

**GAY-LUSSAC** (1778 - 1850)
French physicist and chemist who discovered the law of expansion of gases which holds his name.

**RÉAUMUR** (1683 - 1757)
French physicist and chemist, inventor of the alcohol thermometer (around 1730).
The Réaumur thermometric scale has been replaced by the Celsius scale.

# Glass Thermometers


Thermometers

Promo Lab® by France

a complete line of

# ECONOMY THERMOMETERS

**Ideal for daily use in classrooms and laboratories**


**The glass**

The glass used has a diameter of about 6-7 mm.
The colour of the glass is standardised in yellow giving a much better reading than the white back, mainly for mercury filled thermometers. This is a quality choice even if the white glass is usually less expensive than yellow.

**Immersion**

These thermometers are available in partial or total immersion.
When the thermometer is calibrated for partial immersion, there is a line printed around the thermometer at 76mm with a clear mention: "Imm. 76mm". This mark enables the user to immerse the thermometer to the correct depth ①

More details on the immersions types of thermometers in page 7
or on our website page www.allafrance.com/help.html

**Bulb size**

The bulbs have different sizes even for the same reference article because the diameter of the internal bore can have some variations. We detect variations of the bore to within 0.01mm and we separate according to bore diameter.
In order to compensate these variations, we change the size of the bulb in order to keep the correct volume.


1

2

**The scale is very clear and durable and it is an international protected design.**

## Scale

The numbers are printed every 10 °C (2), and the graduation is much larger than usual enabling an easier reading for the user. The negative temperature numbers are printed vertically while the positive temperature numbers from 0° C (32°F) are printed horizontally.
The scale is printed very dark in order to have a clear reading.
The graduation of Promo Lab® is printed and fused in the glass with a special process. (Note concerning thermometers from the competition: some thermometers, mainly those for high temperatures, are still engraved and the ink does not resist to solvents or other chemical products).
The graduation becomes unreadable. The graduation resists to all chemical products except fluoridric acid and hot soda (to a lesser extent) because these 2 products attack the glass.

**T 001** **Red liquid filling**

| | Range °C | Imm. | mm |
|---|---|---|---|
| Div. 0.5°C | -10+60 | TOT | 305 |
| | -10+60 | 76 mm | 305 |
| Div. 1°C | -20+110 | TOT | 305 |
| | -20+110 | 76 mm | 305 |
| | -20+150 | TOT | 305 |
| | -20+150 | 76 mm | 305 |
| Div. 1°C / 2°F | -20+110°C / 0+230°F | TOT | 305 |
| | -20+110°C / 0+230°F | 76 mm | 305 |

| PVC coating | Range °C | Imm. | mm |
|---|---|---|---|
| Div. 1°C | -20+110 | TOT | 305 |
| | -20+110 | 76 mm | 305 |

**T 002** **Mercury filling**

| | Range °C | Imm. | mm |
|---|---|---|---|
| Div. 1°C | -20+110 | TOT | 305 |
| | -20+110 | 76 mm | 305 |
| | -20+150 | TOT | 305 |
| | -20+150 | 76 mm | 305 |
| | -20+250 | TOT | 350 |
| | -20+250 | 76 mm | 350 |
| Div. 2°C | -20+360 | TOT | 305 |
| | -20+360 | 76 mm | 305 |

| PVC coating | Range °C | Imm. | mm |
|---|---|---|---|
| Div. 1°C | -20+110 | TOT | 305 |
| | -20+110 | 76 mm | 305 |

3 4

## Cap

ALLA FRANCE has developed a special cap in place of a glass ring (3)
The cap has a non roll form. It resists in hot liquid during 30 seconds at 150°C (302°F).
There is a window in front of the expansion chamber enabling the user to verify if there is any column separation (4)

5

## Packing

The thermometers are packed in a strong plastic packaging with a square form, non roll. 10 thermometers of the same article are packed inside a white cardboard box (5)
Two labels on the box indicate:
- The reference and a GEN code
- The temperature range and the subdivision
- The liquid filling

**These thermometers are not available with Calibration Certificates**

HELP

The link to our page www.allafrance.com/help.html is printed on the back of our thermometers and accessible to the user. This page answers most metrological questions asked and allows you to limit repetitive questions to your Customer Service, while being a solid support for your sales force.

MERCURY FREE

# PRECISION THERMOMETERS

BIO TEMP®

**A lucky four leaved clover identifies the range**

## A full line of ecological thermometers to preserve our environment


- **The glass**
  The glass used has a diameter of about 6-7 mm.
  The colour of the glass is standardised in yellow giving a much better reading than the white back, mainly for mercury filled thermometers. This is a quality choice even if the white glass is usually less expensive than yellow.

- **Filling**
  This special line of safe thermometers is with a non toxic filling liquid.
  In case of breakage the residue after decomposition becomes : $H_2O + CO_2$

- **Scale**
  The graduation of our safe thermometers is printed in blue. The graduation is printed and fused in the glass with a special process. Even if you can feel a relief when touching the graduation, the thermometer is not engraved.
  We try to print the scale as dark as possible and feature an arrow printed every 10°C making the temperature much easier to read.


- **Immersion**
  These thermometers are available in partial or total immersion.
  When the thermometer is calibrated for partial immersion (76mm usually), there is a line printed around the thermometer at 76mm with a clear mention: “Imm. 76mm”.
  This mark enables the user to immerse the thermometer to the correct depth.
  A strong triangular ring is moulded at the top of the thermometer avoiding the thermometer to roll on an inclined lab table.

More details on the immersions types of thermometers in page 7
or on our website page www.allafrance.com/help.html

- **Packing**
  Individually packed in recyclable sturdy plastic concertina box's, ideal for storing the instrument when not in use.
  Some references are also available in sealed blister by 6 pcs ①

**Systematically delivered with a Precision and Traceability Certificate**

LABORATORIES GUARANTEE ALLA FRANCE

## T 003 BIO-TEMP® solid stem thermometers

| | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 0.1°C | -1+51 | 0.5 | TOT | 460 |
| | -1+101 | 0.5 | TOT | 610 |
| Div. 0.2°C | -1+51 | 0.6 | TOT | 460 |
| | -1+101 | 0.6 | TOT | 460 |
| Div. 0.5°C | -10+60 | 0.8 | 76 mm | 305 |
| | -10+60 | 0.8 | TOT | 305 |
| | -10+110 | 0.8 | 76 mm | 305 |
| | -10+110 | 0.8 | TOT | 305 |
| Div. 1°C | -100+30 | 2 | 76 mm | 305 |
| | -100+30 | 2 | TOT | 305 |
| | -50+110 | 2 | 76 mm | 305 |
| | -50+110 | 2 | TOT | 305 |
| | -20+110 (*) | 1 | 76 mm | 305 |
| | -20+110 (*) | 1 | TOT | 305 |
| | -20+150 | 1 | 76 mm | 305 |
| | -20+150 | 1 | TOT | 305 |
| | -10+250 | 2 | 76 mm | 405 |

(*) Available in sealed pack of 6 pcs

| PVC coating | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 1°C | -100+30 | 2 | 76 mm | 305 |
| | -100+30 | 2 | TOT | 305 |
| | -50+110 | 2 | 76 mm | 305 |
| | -50+110 | 2 | TOT | 305 |
| | -20+110 | 2 | 76 mm | 305 |
| | -20+110 | 2 | TOT | 305 |

| Téflon® coating | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 0.1°C | -1+51 | 0.5 | TOT | 460 |
| | -1+101 | 0.5 | TOT | 610 |
| Div. 0.2°C | -1+51 | 0.6 | TOT | 460 |
| | -1+101 | 0.6 | TOT | 460 |
| Div. 1°C | -100+30 | 2 | 76 mm | 305 |
| | -100+30 | 2 | TOT | 305 |
| | -50+110 | 2 | 76 mm | 305 |
| | -50+110 | 2 | TOT | 305 |
| | -20+110 | 2 | 76 mm | 305 |
| | -20+110 | 2 | TOT | 305 |
| | -20+150 | 2 | 76 mm | 305 |
| | -20+150 | 2 | TOT | 305 |
| | -10+250 | 3 | 76 mm | 405 |

### PVC coated

PVC coated thermometers are very robust and have a magnifying effect ①
Less expensive than Téflon® coated thermometers.

### Téflon® coated

Thermometers coated with Téflon® are very robust and completely protected in case of breakage of glass ②

Teflon® = Reg TM E.I. du Pont de Nemours & Co.

1

2

### BOTTLE-BASE HDPE BIO-TEMP® Thermometers

A high density polyethylene base houses the reservoir of the thermometer, acting as a thermal brake.
These thermometers are supplied with adhesive strip, magnets and with a Certificate of Conformity.

EU
Traceable Calibration Certificate upon request

## T 004

③

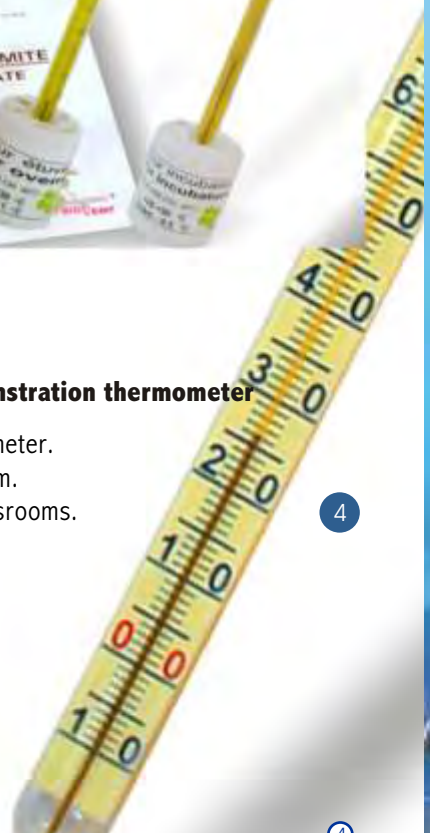
| Téflon® coating | Applications | Range °C | Accuracy °C | mm |
|---|---|---|---|---|
| Div. 0.5°C | FREEZERS-REFRIGERATORS | -30+5 | 0.5 | 150 |
| | CULTURE OF BACTERIA, VIRUS | -5+30 | 0.5 | 150 |
| | INCUBATORS | +20+50 | 0.5 | 150 |
| Div. 1°C | CRYOGENICS | -80+20 | 1 | 150 |
| | OVENS | +20+130 | 1 | 150 |

3

### BIO-TEMP® demonstration thermometer

Extra large thermometer.
Readable at 9ft / 3 m.
Ideal for use in classrooms.
Without certificate.

④



## T 005

④

| | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 1°C | -10+110 | 2 | 150 mm | 650 |

HELP

The link to our page www.allafrance.com/help.html is printed on the back of our thermometers and accessible to the user. This page answers most metrological questions asked and allows you to limit repetitive questions to your Customer Service, while being a solid support for your sales force.

# PRECISION THERMOMETERS


1

## The glass

These thermometers are manufactured using a type N 16 Sodocalcique glass with a diameter of about 6-7 mm.
The colour of the glass is standardised in yellow giving a much better reading than the white back, mainly for mercury filled thermometers. This is a quality choice even if the white glass is usually less expensive than yellow. They possess an expansion chamber to support temperatures higher than those of the thermometer.

## Scale

The graduation is printed and fused in the glass with a special process. The graduation resists to all chemical products except fluoridric acid and hot soda (to a lesser extent) because these 2 products attack the glass. Even if you can feel a relief when touching the graduation, the thermometer is not engraved.

## Immersion

These thermometers are available in partial or total immersion.
When the thermometer is calibrated for partial immersion (76mm usually), there is a line printed around the thermometer at 76mm with a clear mention: "Imm. 76mm" ①. This mark enables the user to immerse the thermometer to the correct depth.

More details on the immersions types of thermometers in page 7
or on our website page www.allafrance.com/help.html

## Packing

Individually packed in recyclable sturdy plastic concertina box's, ideal for storing the instrument when not in use.
Some references are also available in sealed blister by 6 or 15 pcs.

**Systematically delivered with a Precision and Traceability Certificate**

HELP

The link to our page www.allafrance.com/help.html is printed on the back of our thermometers and accessible to the user. This page answers most metrological questions asked and allows you to limit repetitive questions to your Customer Service, while being a solid support for your sales force.

## T 006 Red liquid filling

| | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 0.5°C | -10+60 | 0.8 | 76 mm | 305 |
| | -10+60 | 0.8 | TOT | 305 |
| | -10+110 | 0.8 | 76 mm | 305 |
| | -10+110 | 0.8 | TOT | 305 |
| Div. 1°C | -100+30 | 2 | 76 mm | 305 |
| | -100+30 | 2 | TOT | 305 |
| | -50+110 | 2 | 76 mm | 305 |
| | -50+110 | 2 | TOT | 305 |
| | -20+110 | 1 | 76 mm | 305 |
| | -20+110 | 1 | TOT | 305 |
| | -20+150 | 1 | 76 mm | 305 |
| | -20+150 | 1 | TOT | 305 |
| Div. 1°C/2°F | -20+110°C / 0+230°F | 2 | TOT | 305 |

## T 007 Mercury filling

| | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 0.1°C | -1+51 | 0.3 | 76 mm | 460 |
| | -1+51 | 0.3 | TOT | 460 |
| | -1+101 | 0.3 | 76 mm | 610 |
| | -1+101 | 0.3 | TOT | 610 |
| Div. 0.2°C | -1+51 | 0.6 | 76 mm | 460 |
| | -1+51 | 0.6 | TOT | 460 |
| | -1+101 | 0.8 | 76 mm | 460 |
| | -1+101 | 0.6 | TOT | 460 |
| Div. 0.5°C | -10+60 | 0.8 | 76 mm | 305 |
| | -10+60 | 0.8 | TOT | 305 |
| | -10+110 | 0.8 | 76 mm | 305 |
| | -10+110 | 0.8 | TOT | 305 |
| Div. 1°C | -20+110 | 1 | 76 mm | 305 |
| | -20+110 | 1 | TOT | 305 |
| | -20+150 | 1 | 76 mm | 305 |
| | -20+150 | 1 | TOT | 305 |
| | -20+250 | 2 | 76 mm | 305 |
| | -20+250 | 2 | TOT | 305 |
| Div. 2°C | -20+360 | 4 | 76 mm | 305 |
| | -20+360 | 4 | TOT | 305 |
| | -20+400 | 4 | 76 mm | 305 |
| | -20+400 | 4 | TOT | 305 |
| | -10+500 | 4 | 76 mm | 405 |
| | -10+500 | 4 | TOT | 405 |


## T 008 In sealed blister packaging ①

| Red liquid filling | Range °C | Accuracy °C | Imm. | mm | UC** |
|---|---|---|---|---|---|
| Div. 1°C | -20+110 | 1 | 76 mm | 305 | 6 |
| | -20+110 | 1 | TOT | 305 | 6 |

| Mercury filling | Range °C | Accuracy °C | Imm. | mm | UC** |
|---|---|---|---|---|---|
| Div. 1°C | -20+110 | 1 | 76 mm | 305 | 6 |
| | -20+110 | 1 | TOT | 305 | 6 |
| | -20+110 | 1 | 76 mm | 305 | 15 (*) |
| | -20+110 | 1 | TOT | 305 | 15 (*) |

(**) UC = pack quantity
(*) Delivered with decontamination kit (see page 51)

### Téflon® coated

Thermometers coated with Teflon® are very robust and in case of breakage, the glass and the filling liquid are contained inside the Teflon sleeve.

## T 009 Mercury filling ②

| | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 1°C | -20+110 | 2 | 76 mm | 305 |
| | -20+110 | 2 | TOT | 305 |
| | -20+150 | 2 | 76 mm | 305 |
| | -20+150 | 2 | TOT | 305 |
| | -10+250 | 3 | 76 mm | 305 |
| | -10+250 | 3 | TOT | 305 |

Teflon® = Reg TM E.I. du Pont de Nemours & Co.


### PVC coated

Advantages of these thermometers:
- magnifying effect
- in case of breakage, the glass and the filling liquid are contained inside the PVC sleeve
- less expensive than Téflon® coating thermometers

## T 009 Red liquid or mercury filling ③

| | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| Div. 1°C | -20+110 | 2 | 76 mm | 305 |
| | -20+110 | 2 | TOT | 305 |

### Round top thermometers

Specially designed to be inserted into protection sleeves (see page 51). Principaly used for the petroleum field. Without certificate.

## T 010 Red liquid or mercury filling

| | Range °C | Accuracy °C | Imm. | mm | |
|---|---|---|---|---|---|
| Div. 0.5°C | -10+60 | 0.8 | 76 mm | 305 | |
| Div. 1°C | -20+110 | 1 | 76 mm | 305 | |
| Div. 1°C/2°F | -20+110°C / 0+230°F | 2 | TOT | 305 | (*) |

(*) Only in Red liquid filling

# EUROPEAN

## STANDARDIZED THERMOMETERS ISO, BS, DIN, NF, IP ...

MRA TRACEABLE


1

- **The glass**

These standardized thermometers are manufactured using a type N 16 Sodocalcique glass used has a diameter of about 6-7 mm. The colour of the glass is standardised in yellow giving a much better reading than the white back, mainly for mercury filled thermometers. This is a quality choice even if the white glass is usually less expensive than yellow.

- **Scale**

Graduation lines are fine and easily readable. The graduation is printed and fused in the glass with a special process. The graduation resists to all chemical products except fluoridric acid and hot soda (to a lesser extent) because these 2 products attack the glass. Even if you can feel a relief when touching the graduation, the thermometer is not engraved.
They possess a suspension ring and an expansion chamber to support temperatures higher than those of the thermometer.

- **Immersion**

They are calibrated for total immersion.
Some references are also available with partial immersion, upon request.

More details on the immersions types of thermometers in page 7
or on our website page www.allafrance.com/help.html

- **Traceability**

Every standard thermometer has an individual number printed on the back.
This number is stocked in our data base and fully traceable to our official masters.

- **Calibration and Certificates**

Our official masters are regularly controlled and are traceable in over 68 countries worldwide (see page5).

**Systematically delivered with a Traceability and Conformity Certificate**

Available, upon request with an ALLA FRANCE EU Traceable Calibration Certificate, or an EO Official Calibration Certificate controlled by an accredited European Laboratory (see pages 4-5 for more information about Certificates).

HELP

The link to our page www.allafrance.com/help.html is printed on the back of our thermometers and accessible to the user. This page answers most metrological questions asked and allows you to limit repetitive questions to your Customer Service, while being a solid support for your sales force.

## ISO 653 - DIN 12775 - NF 35502 - BS 5074

They possess an auxiliary scale around the "ZERO" point when the temperature scale is positive.
The filling liquid is Mercury or Mercury Thallium.
They are calibrated for total immersion.

EO EU
Official or Traceable Calibration Certificate upon request

**T 011** **STL Series** ①

| Serie | Range °C | Div. °C | Accuracy °C | Auxiliary Scale | mm |
|---|---|---|---|---|---|
| STL1 | -25+5 | 0.1 | 0.1 | - | 375 |
| STL2 | -5+25 | 0.1 | 0.1 | - | 375 |
| STL3 | +20+45 | 0.1 | 0.1 | -0.5+0.5 | 375 |
| STL4 | +40+65 | 0.1 | 0.1 | -0.5+0.5 | 375 |
| STL5 | +60+85 | 0.1 | 0.1 | -0.5+0.5 | 375 |
| STL6 | +80+105 | 0.1 | 0.1 | -0.5+0.5 | 375 |
| STL7 | -55+5 | 0.2 | 0.2 | - | 375 |
| STL8 | -35+25 | 0.2 | 0.2 | - | 375 |
| STL9 | -15+45 | 0.2 | 0.2 | - | 375 |
| STL10 | +35+85 | 0.2 | 0.2 | - | 375 |
| STL11 | +75+125 | 0.2 | 0.2 | -1+1 | 375 |
| STL12 | +115+165 | 0.2 | 0.2 | -1+1 | 375 |
| STL13 | +155+205 | 0.2 | 0.2 | -1+1 | 375 |
| STL14 | -35+115 | 0.5 | 0.5 | - | 375 |
| STL15 | +90+210 | 0.5 | 0.5 | -3+3 | 375 |
| STL16 | +190+310 | 0.5 | 0.5 | -3+3 | 375 |
| STL17 | -30+270 | 1 | 1 | - | 375 |
| STL18 | +180+420 | 1 | 1 | -5+5 | 375 |


## ISO 1770 - DIN 12778 - NF 35506 - BS 1704

The filling liquid is mercury, except for thermometers used below -38°C, for which we use a red tinted organic liquid.
They are calibrated for total immersion.

EO EU
Official or Traceable Calibration Certificate upon request

**T 012**

| Serie | Range °C | Div. °C | Accuracy °C | mm |
|---|---|---|---|---|
| A | -100+30 | 1 | 2 | 305 |
| B | -35+30 | 0.5 | 1 | 305 |
| C | 0+60 | 0.5 | 0.5 | 305 |
| D | 0+100 | 1 | 1 | 305 |
| E | 0+160 | 1 | 2 | 305 |
| F | 0+250 | 1 | 2 | 305 |
| G | 0+360 | 2 | 4 | 305 |
| H | 0+500 | 5 | 10 | 350 |
| J | -100+50 | 1 | 2 | 305 |
| K | -50+50 | 1 | 2 | 305 |
| L | -1+51 | 0.1 | 0.3 | 460 |
| M | -1+101 | 0.1 | 0.3 | 610 |
| N | -1+201 | 0.2 | 0.5 | 610 |
| P | -35+50 | 1 | 0.5 | 305 |
| R | -20+110 | 1 | 0.5 | 305 |
| S | -20+150 | 1 | 0.5 | 305 |
| T | -10+260 | 1 | 1 | 405 |
| V | -10+400 | 2 | 4 | 405 |
| W | -10+500 | 2 | 4 | 405 |

Partial immersion upon request

## ISO 651 - NF B 35508

The diameter is 9 mm.
The filling liquid is Mercury.

**T 013** **Calorimeter thermometers**

| Range °C | Div. °C | Accuracy °C | mm |
|---|---|---|---|
| +9+15 | 0.01 | 0.1 | 750 |
| +12+18 | 0.01 | 0.1 | 750 |
| +15+21 | 0.01 | 0.1 | 750 |
| +18+24 | 0.01 | 0.1 | 750 |
| +21+27 | 0.01 | 0.1 | 750 |
| +24+30 | 0.01 | 0.1 | 750 |
| +27+33 | 0.01 | 0.1 | 750 |
| +30+36 | 0.01 | 0.1 | 750 |
| +33+39 | 0.01 | 0.1 | 750 |
| +36+42 | 0.01 | 0.1 | 750 |
| +39+45 | 0.01 | 0.1 | 750 |

- **I.P.** is a British Standard.
  Made in accordance with the specifications of the **INSTITUTE OF PETROLEUM (I.P.)**.

- **Calibration points**
  The IP Thermometers with Calibration Certificate are checked at the specified points in the standard (More information on the different types of Certificates on pages 4-5).

EO EU
Official or Traceable Calibration Certificate upon request


Many **I.P.** thermometers correspond to the American standard **A.S.T.M.**

If an **I.P.** thermometer has an equivalent **A.S.T.M** thermometer, both standards are printed on the back of the instrument.

### IP °C / A.S.T.M. °C Correspondences

| IP | 1 | 2 | 5 | 6 | 14 | 15 | 16 | 17 | 18 | 20 | 21 | 23 | 24 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM | 5 | 6 | 7 | 8 | 114 | 9 | 10 | 14 | 54 | 33 | 34 | 18 | 22 | 11 | 44 | 45 | 28 | 121 | 128 | 29 |
| IP | 35 | 36 | 47 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 71 | 72 | 73 | 77 | 78 | 79 |
| ASTM | 47 | 129 | 13 | 35 | 15 | 16 | 2 | 61 | 12 | 43 | 46 | 72 | 73 | 74 | 126 | 71 | 3 | 37 | 38 | 39 |
| IP | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 92 | 93 | 94 | 95 | 96 | 97 | 99 | 102 | |
| ASTM | 40 | 41 | 42 | 102 | 103 | 104 | 105 | 106 | 107 | 113 | 48 | 120 | 110 | 122 | 123 | 124 | 125 | 127 | 132 | |

## T 014 I.P Series

| I.P. | | Range °C | Div. °C | Imm. | mm |
|---|---|---|---|---|---|
| 1C | Cloud and Pour | -38 +50 | 1 | 108 mm | 230 |
| 2C | Low Cloud and Pour | -80 +20 | 1 | 76 mm | 230 |
| 3C | Demulsification | -1+105 | 0.5 | TOT | 305 |
| 4C | Crude Oil Distillation | -4+360 | 2 | TOT | 310 |
| 5C | Low Distillation | -2 +300 | 1 | TOT | 385 |
| 6C | High Distillation | -2 +400 | 1 | TOT | 385 |
| 8C | Flushing-Case Low | 0 +45 | 0.2 | 65 mm | 340 |
| 9C | Flushing-Case Medium | +40 +85 | 0.2 | 65 mm | 340 |
| 14C | Aviation Fuel Freezing P. | -80 +20 | 0.5 | TOT | 300 |
| 15C | Low Pensky-Martens | -5 +110 | 0.5 | 57 mm | 290 |
| 16C | High Pensky-Martens | +90 +370 | 2 | 57 mm | 290 |
| 17C | Wax Melting Point | +38 +82 | 0.1 | 79 mm | 375 |
| 18C | Congealing Point | +20 +100.6 | 0.2 | TOT | 310 |
| 20C | Low Aniline Point | -38 +42 | 0.2 | 50 mm | 420 |
| 21C | Medium Aniline Point | +25 +105 | 0.2 | 50 mm | 420 |
| 22C | Oxidation | +195 +205 | 0.1 | 100 mm | 300 |
| 23C | Raid Vapor Pressure | +34 +42 | 0.1 | TOT | 275 |
| 24C | Oxidation Stability | +95 +103 | 0.1 | TOT | 275 |
| 28C | Cleveland Open Flash | -6 +400 | 2 | 25 mm | 310 |
| 29C | Kinematic Viscosity | +18.6 +21.4 | 0.05 | TOT | 305 |
| 30C | Kinematic Viscosity | +23.6 +26.4 | 0.05 | TOT | 305 |
| 31C | Kinematic Viscosity | +36.6 +39.4 | 0.05 | TOT | 305 |
| 32C | Kinematic Viscosity | +98.6 +101.4 | 0.05 | TOT | 305 |
| 33C | Kinematic Viscosity | -1.4 +1.4 | 0.05 | TOT | 305 |
| 34C | Kinematic Viscosity | +52.6 +55.4 | 0.05 | TOT | 305 |
| 35C | Kinematic Viscosity | +58.6 +61.4 | 0.05 | TOT | 305 |
| 36C | Kinematic Viscosity | +91.6 +94.4 | 0.05 | TOT | 305 |
| 37C | Sludge | +144 +156 | 0.2 | 100 mm | 270 |
| 38C | Pen | +23 +27 | 0.1 | TOT | 260 |
| 39C | Density | -1 +38 | 0.1 | TOT | 440 |
| 40C | Low Drop Point | +20 +120 | 1 | 100 mm | 250 |
| 41C | High Drop Point | +100 +230 | 1 | 100 mm | 250 |
| 42C | Breaking Point | -38 +30 | 0.5 | 250 mm | 370 |
| 43C | FP Cut-Back (Int) | +10 +110 | 0.5 | 61 mm | 305 |
| 44C | FP Cut-Back (Ext) | +15 +121 | 0.5 | 89 mm | 305 |
| 45C | Refractometer | +15 +30 | 0.2 | 22 mm | 160 |
| 46C | Westphal Balance | +14.5 +21 | 0.1 | TOT | 160 |
| 47C | Loss on Heat | +155 +170 | 0.5 | TOT | 155 |
| 48C | Tank Low | -38 +30 | 0.5 | TOT | 310 |
| 49C | Tank Medium | -15 +40 | 0.5 | TOT | 310 |
| 50C | Tank High | +10 +65 | 0.5 | TOT | 310 |
| 51C | Tank Heated Fuel | +35 +120 | 0.5 | TOT | 310 |
| 52C | Tank Bitumen | +90 +260 | 1 | TOT | 310 |
| 53C | Tank Cargo | 0 +80 | 0.5 | TOT | 310 |
| 59C | High Aniline Point | +90 +170 | 0.2 | 50 mm | 420 |
| 60C | Low Softening Point | -2 +80 | 0.2 | TOT | 395 |
| 61C | High Softening Point | +30 +200 | 0.5 | TOT | 395 |
| 62C | Partial Immersion | -5 +300 | 1 | 76 mm | 390 |
| 63C | Petrolatum Melting Point | +32 +127 | 0.2 | 79 mm | 380 |
| 64C | Density-Wide Range | -20 +102 | 0.2 | TOT | 420 |
| 65C | Kinematic Viscosity Low | -51.6 -34 | 0.1 | TOT | 417 |
| 66C | Kinematic Viscosity | +48.6 +51.4 | 0.05 | TOT | 305 |
| 67C | Kinematic Viscosity | -19.4 -16.6 | 0.05 | TOT | 305 |
| 68C | Kinematic Viscosity | -41.4 -38.6 | 0.05 | TOT | 305 |
| 69C | Kinematic Viscosity | -55.4 -52.6 | 0.05 | TOT | 305 |
| 71C | Kinematic Viscosity | -27.4 -24.6 | 0.05 | TOT | 305 |
| 72C | Oil in Wax | -37 +21 | 0.5 | 76 mm | 355 |
| 73C | Partial Immersion | -5 +400 | 1 | 76 mm | 415 |
| 74C | Abel Oil Cup Wide Range | -35 +70 | 0.5 | 61 mm | 310 |
| 75C | Abel Water Bath Wide R. | -30 +80 | 0.5 | 89 mm | 310 |
| 76C | Engler Viscosity | +10 +55 | 0.5 | 93 mm | 240 |
| 77C | Solvents Distillation | -2 +52 | 0.2 | 100 mm | 395 |
| 78C | Solvents Distillation | +24 +78 | 0.2 | 100 mm | 395 |
| 79C | Solvents Distillation | +48 +102 | 0.2 | 100 mm | 395 |
| 80C | Solvents Distillation | +72 +126 | 0.2 | 100 mm | 395 |
| 81C | Solvents Distillation | +98 +152 | 0.2 | 100 mm | 395 |
| 82C | Solvents Distillation | +95 +255 | 0.5 | 100 mm | 395 |
| 83C | Solvents Distillation | +123 +177 | 0.2 | 100 mm | 395 |
| 84C | Solvents Distillation | +148 +202 | 0.2 | 100 mm | 395 |
| 85C | Solvents Distillation | +173 +227 | 0.2 | 100 mm | 395 |
| 86C | Solvents Distillation | +198 +252 | 0.2 | 100 mm | 395 |
| 87C | Solvents Distillation | +223 +277 | 0.2 | 100 mm | 395 |
| 88C | Solvents Distillation | +248 +302 | 0.2 | 100 mm | 395 |
| 89C | Softening Point (Bitumen) | -1 +175 | 0.5 | TOT | 405 |
| 90C | Kinematic Viscosity | +80.6 +83.4 | 0.05 | TOT | 305 |
| 91C | Rapid Flash | 0 +110 | 1 | 44 mm | 198 |
| 92C | Kinematic Viscosity | +38.6 +41.4 | 0.05 | TOT | 305 |
| 93C | Kinematic Viscosity | +133.6 +136.4 | 0.05 | TOT | 305 |
| 94C | Brookfield Viscosity | -45 -35 | 0.1 | TOT | 300 |
| 95C | Brookfield Viscosity | -35 -25 | 0.1 | TOT | 300 |
| 96C | Brookfield Viscosity | -25 -15 | 0.1 | TOT | 300 |
| 97C | Brookfield Viscosity | -15 -5 | 0.1 | TOT | 300 |
| 98C | Rapid Flash High | +100 +300 | 2 | 44 mm | 197 |
| 99C | Kinematic Viscosity | -21.4 -18.6 | 0.05 | TOT | 305 |
| 100C | Kinematic Viscosity | +78.6 +81.4 | 0.05 | TOT | 305 |
| 101C | Medium Pensky Martens | +20 +150 | 1 | 57 mm | 290 |
| 102C | Kinematic Viscosity | +148.6 +151.4 | 0.05 | TOT | 305 |

# U.S.A

NIST TRACEABLE

## STANDARDIZED THERMOMETERS A.S.T.M


- **A.S.T.M** is an American standard. These thermometers are manufactured according to the E-1 specifications of the **AMERICAN SOCIETY FOR TESTING AND MATERIAL** (A.S.T.M.).

- **The glass**
  The colour of the glass of our A.S.T.M thermometers is standardized in yellow giving a much better reading than the white back, mainly for mercury filled thermometers. This is a quality choice even if the white glass is usually less expensive than yellow.

- **Scale**
  Graduation lines are fine and easily readable.
  The measurement scale is fused into the glass with a special manufacturing process makes it completely indelible and very resistant to chemical agents exept fluoridric acid and hot soda (to a lesser extent) because these 2 products attack the glass. Even if you can feel a slight relief on the glass, the thermometer is not engraved.

- **Traceability**
  Every standardized thermometer has an individual number printed on the back. This number is stocked in our data base and fully traceable to our official masters.
  The thermometer is fully marked on the back with the ASTM number, the purpose and ASTM method.

  If an **A.S.T.M** thermometer has an equivalent **I.P**, both standards are printed on the back of the instrument.

- **Calibration and Certificates**
  Our official masters are regularly controlled and are traceable in over 68 countries worldwide (see page 5).

**Systematically delivered with a Traceability and Conformity Certificate**

Available, upon request with an ALLA FRANCE EU Traceable Calibration Certificate, or an EO Official Calibration Certificate controlled by an accredited European Laboratory (see pages 4-5 for more information about Certificates).

HELP

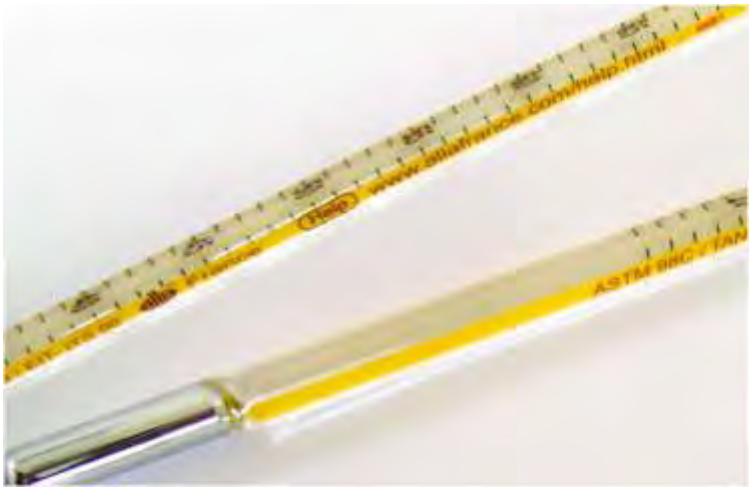
The link to our page www.allafrance.com/help.html is printed on the back of our thermometers and accessible to the user. This page answers most metrological questions asked and allows you to limit repetitive questions to your Customer Service, while being a solid support for your sales force.

## Calibration points

The A.S.T.M thermometers with Calibration Certificate are checked at the specified points in the standard.

More information about Certificates on pages 4-5 of our Catalogue or on our website page http://www.allafrance.com/certification.html

Official or Traceable Calibration Certificate upon request



### T 015 A.S.T.M °C Series

| A.S.T.M | | Range °C | Div. °C | Imm. | mm | Control points °C |
|---|---|---|---|---|---|---|
| 1C | Partial immersion | -20 +150 | 1 | 76 mm | 322 | -20 0 50 100 150 |
| 2C | Partial immersion | -5 +300 | 1 | 76 mm | 390 | 0 75 150 225 300 |
| 3C | Partial immersion | -5 +400 | 1 | 76 mm | 415 | 0 100 200 300 370 |
| 5C | Cloud and Pour | -38 +50 | 1 | 108 mm | 230 | -35 0 50 |
| 6C | Low Cloud and Pour | -80 +20 | 1 | 76 mm | 230 | -70 -35 0 20 |
| 7C | Low Distillation | -2 +300 | 1 | TOT | 385 | 0 50 100 150 200 250 300 |
| 8C | High Distillation | -2 +400 | 1 | TOT | 385 | 0 100 200 300 370 |
| 9C | Low Pensky-Martens | -5 +110 | 0.5 | 57 mm | 290 | 0 35 70 105 |
| 10C | High Pensky-Martens | +90 +370 | 2 | 57 mm | 290 | 100 200 300 370 |
| 11C | Cleveland Open Flash | -6 +400 | 2 | 25 mm | 310 | 0 100 200 300 370 |
| 12C | Density-Wide Range | -20 +102 | 0.2 | TOT | 420 | -20 -10 0 10 20 30 40 50 60 70 80 90 100 |
| 13C | Loss on Heat | +155 +170 | 0.5 | TOT | 155 | 155 163 170 |
| 14C | Wax Melting Point | +38 +82 | 0.1 | 79 mm | 375 | 40 50 60 70 80 |
| 15C | Low Softening Point | -2 +80 | 0.2 | TOT | 395 | 0 20 40 60 80 |
| 16C | High Softening Point | +30 +200 | 0.5 | TOT | 395 | 30 60 90 120 150 180 200 |
| 17C | Saybolt Viscosity | +19 +27 | 0.1 | TOT | 275 | 21 25 |
| 18C | Reid vapor pressure | +34 +42 | 0.1 | TOT | 275 | 38 41 |
| 19C | Saybolt Viscosity | +49 +57 | 0.1 | TOT | 275 | 50 54 |
| 20C | Saybolt Viscosity | +57 +65 | 0.1 | TOT | 275 | 60 64 |
| 21C | Saybolt Viscosity | +79 +87 | 0.1 | TOT | 275 | 82 86 |
| 22C | Oxidation Stability | +95 +103 | 0.1 | TOT | 275 | 99 102 |
| 23C | Engler Viscosity | +18 +28 | 0.2 | 90 mm | 212 | 20 25 |
| 24C | Engler Viscosity | +39 +54 | 0.2 | 90 mm | 237 | 40 50 |
| 25C | Engler Viscosity | +95 +105 | 0.2 | 90 mm | 212 | 95 100 |
| 26C | Stab. Test of Sol. Nitroc. | +130 +140 | 0.1 | TOT | 463 | 130 135 140 |
| 27C | Turpentine Distillation | +147 +182 | 0.5 | 76 mm | 301 | 155 165 175 |
| 28C | Kinematic Viscosity 37.8°C | +36.6 +39.4 | 0.05 | TOT | 305 | 0 37.8 39 |
| 29C | Kinematic Viscosity 54.4°C | +52.6 +55.4 | 0.05 | TOT | 305 | 0 54.4 55 |
| 33C | Low Aniline Point | -38 +42 | 0.2 | 50 mm | 420 | -35 -20 0 20 40 |
| 34C | Medium Aniline Point | +25 +105 | 0.2 | 50 mm | 420 | 25 45 65 85 100 |
| 35C | High Aniline Point | +90 +170 | 0.2 | 50 mm | 420 | 100 120 140 160 170 |
| 36C | Titer Test | -2 +68 | 0.2 | 45 mm | 405 | 0 15 30 45 65 |
| 37C | Solvents Distillation | -2 +52 | 0.2 | 100 mm | 395 | 0 15 30 50 |
| 38C | Solvents Distillation | +24 +78 | 0.2 | 100 mm | 395 | 25 40 55 75 |
| 39C | Solvents Distillation | +48 +102 | 0.2 | 100 mm | 395 | 50 65 80 100 |
| 40C | Solvents Distillation | +72 +126 | 0.2 | 100 mm | 395 | 75 90 105 125 |
| 41C | Solvents Distillation | +98 +152 | 0.2 | 100 mm | 395 | 100 115 130 150 |
| 42C | Solvents Distillation | +95 +255 | 0.5 | 100 mm | 395 | 100 150 200 250 |
| 43C | Kinematic Viscosity | -51.6 -34 | 0.1 | 100 mm | 420 | -50 -45 -40 -35 0 |
| 44C | Kinematic Viscosity | +18.6 +21.4 | 0.05 | TOT | 305 | 0 20 21 |
| 45C | Kinematic Viscosity | +23.6 +26.4 | 0.05 | TOT | 305 | 0 25 26 |
| 46C | Kinematic Viscosity | +48.6 +51.4 | 0.05 | TOT | 305 | 0 50 51 |
| 47C | Kinematic Viscosity | +58.6 +61.4 | 0.05 | TOT | 305 | 0 60 61 |
| 48C | Kinematic Viscosity | +80.6 +83.4 | 0.05 | TOT | 305 | 0 82.2 83 |
| 49C | Stormer Viscosity | +20 +70 | 0.2 | 65 mm | 305 | 20 35 50 70 |
| 52C | Butad. Boiling P.Range | -10 +5 | 0.1 | TOT | 162 | -10 0 5 |
| 54C | Congealing Point | +20 +100.6 | 0.2 | TOT | 310 | 20 50 75 100 |
| 56C | Bomb Calorimeter | +19 +35 | 0.02 | TOT | 595 | 19 21 23 25 27 29 31 33 35 |
| 57C | Tag Closed Tester, Low R. | -20 +50 | 0.5 | 57 mm | 287 | -20 0 25 50 |
| 58C | Tank | -34 +49 | 0.5 | TOT | 305 | -30 0 25 45 |
| 59C | Tank | -18 +82 | 0.5 | TOT | 305 | 0 25 55 80 |
| 60C | Tank | +77 +260 | 1 | TOT | 305 | 100 175 255 |
| 61C | Petrolatum Melting Point | +32 +127 | 0.2 | 79 mm | 380 | 40 60 80 100 120 |
| 62C | Precision | -38 +2 | 0.1 | TOT | 379 | -37 -30 -20 -10 0 |
| 63C | Precision | -8 +32 | 0.1 | TOT | 379 | -7 0 10 20 30 |
| 64C | Precision | +25 +55 | 0.1 | TOT | 379 | 0 25 35 45 55 |
| 65C | Precision | +50 +80 | 0.1 | TOT | 379 | 0 50 60 70 80 |
| 66C | Precision | +75 +105 | 0.1 | TOT | 379 | 0 75 85 95 105 |
| 67C | Precision | +95 +155 | 0.2 | TOT | 379 | 0 100 110 130 150 |

## T 015 ... A.S.T.M °C Series

| A.S.T.M | | Range °C | Div. °C | Imm. | mm | Control points °C |
|---|---|---|---|---|---|---|
| 68C | Precision | +145 +205 | 0.2 | TOT | 379 | 0 150 170 190 205 |
| 69C | Precision | +195 +305 | 0.5 | TOT | 379 | 0 200 235 270 305 |
| 70C | Precision | +295 +405 | 0.5 | TOT | 379 | 0 300 335 370 400 |
| 71C | Oil in Wax | -37 +21 | 0.5 | 76 mm | 355 | -35 -18 0 20 |
| 72C | Kinematic Viscosity | -19.4 -16.6 | 0.05 | TOT | 305 | -19 -17.8 0 |
| 73C | Kinematic Viscosity | -41.4 -38.6 | 0.05 | TOT | 305 | -41 -40 0 |
| 74C | Kin Visc -53.9°C | -55.4 -52.6 | 0.05 | TOT | 305 | -55 -53.9 0 |
| 82C | Fuel rating, Engine | -15 +105 | 1 | 30 mm | 162 | 0 50 100 |
| 83C | Fuel Rating, Air low | +15 +70 | 1 | 40 mm | 171 | 25 70 |
| 84C | Fuel Rating, Orifice Tank | +25 +80 | 1 | 249 mm | 382 | 30 80 |
| 85C | Fuel Rating, Surge | +40 +150 | 1 | 181 mm | 310 | 50 150 |
| 86C | Fuel Rating, Mix | +95 +175 | 1 | 35 mm | 167 | 100 175 |
| 87C | Fuel Rating, Coolant | +150 +205 | 1 | 40 mm | 172 | 160 200 |
| 88C | Vegetable Oil Flash | +10 +200 | 1 | 57 mm | 287 | 40 100 150 200 |
| 89C | Solidification Point | -20 +10 | 0.1 | 76 mm | 370 | -20 -10 0 10 |
| 90C | Solidification Point | 0 +30 | 0.1 | 76 mm | 370 | 0 10 20 30 |
| 91C | Solidification Point | +20 +50 | 0.1 | 76 mm | 370 | 20 30 40 50 |
| 92C | Solidification Point | +40 +70 | 0.1 | 76 mm | 370 | 40 50 60 70 |
| 93C | Solidification Point | +60 +90 | 0.1 | 76 mm | 370 | 60 70 80 90 |
| 94C | Solidification Point | +80 +110 | 0.1 | 76 mm | 370 | 80 90 100 110 |
| 95C | Solidification Point | +100 +130 | 0.1 | 76 mm | 370 | 100 110 120 130 |
| 96C | Solidification Point | +120 +150 | 0.1 | 76 mm | 370 | 120 130 140 150 |
| 97C | Tank | -18 +49 | 0.5 | TOT | 302 | -15 0 20 45 |
| 98C | Tank | +16 +82 | 0.5 | TOT | 302 | 20 40 60 80 |
| 99C | Weathering Test | -50 +5 | 0.2 | 35 mm | 302 | -46 -32 -18 0 |
| 100C | Solidification Point | +145 +205 | 0.2 | 76 mm | 370 | 145 165 185 205 |
| 101C | Solidification Point | +195 +305 | 0.5 | 76 mm | 370 | 200 250 300 |
| 102C | Solvents Distillation | +123 +177 | 0.2 | 100 mm | 395 | 125 140 155 175 |
| 103C | Solvents Distillation | +148 +202 | 0.2 | 100 mm | 395 | 150 165 180 200 |
| 104C | Solvents Distillation | +173 +227 | 0.2 | 100 mm | 395 | 175 190 205 225 |
| 105C | Solvents Distillation | +198 +252 | 0.2 | 100 mm | 395 | 200 215 230 250 |
| 106C | Solvents Distillation | +223 +277 | 0.2 | 100 mm | 395 | 225 240 255 275 |
| 107C | Solvents Distillation | +248 +302 | 0.2 | 100 mm | 395 | 250 265 280 300 |
| 110C | Kinematic Viscosity | +133.6 +136.4 | 0.05 | TOT | 305 | 0 135 136 |
| 111C | Tar Acids Distillation | +170 +250 | 0.2 | 100 mm | 395 | 170 200 250 |
| 112C | Solidification P.Benzene | +4 +6 | 0.02 | TOT | 215 | 0 4 5 6 |
| 113C | Soft.P.(Bitumen) Wide R. | -1 +175 | 0.5 | TOT | 405 | 0 50 100 150 175 |
| 114C | Aviation Fuel Freezing P. | -80 +20 | 0.5 | TOT | 300 | -75 -60 -40 0 |
| 116C | Bomb Calorimeter | +18.9 +25.1 | 0.01 | TOT | 609 | 19 20 21 22 23 24 25 |
| 117C | Bomb Calorimeter | +23.9 +30.1 | 0.01 | TOT | 609 | 24 25 26 27 28 29 30 |
| 118C | Kinematic Viscosity | +28.6 +31.4 | 0.05 | TOT | 305 | 0 30 31 |
| 119C | Coolant (Antif.) Fr. Pt. | -38.3 -30 | 0.1 | 100 mm | 420 | -38 -30 0 |
| 120C | Kinematic Viscosity | +38.6 +41.4 | 0.05 | TOT | 305 | 0 40 41 |
| 121C | Kinematic Viscosity | +98.6 +101.4 | 0.05 | TOT | 305 | 0 100 101 |
| 122C | Brookfield Viscosity | -45 -35 | 0.1 | TOT | 300 | -45 -40 -35 |
| 123C | Brookfield Viscosity | -35 -25 | 0.1 | TOT | 300 | -35 -30 -25 |
| 124C | Brookfield Viscosity | -25 -15 | 0.1 | TOT | 300 | -25 -20 -15 |
| 125C | Brookfield Viscosity | -15 -5 | 0.1 | TOT | 300 | -15 -10 -5 |
| 126C | Kinematic Viscosity | -27.4 -24.6 | 0.05 | TOT | 305 | -27 -26.1 0 |
| 127C | Kinematic Viscosity | -21.4 -18.6 | 0.05 | TOT | 305 | -21 -20 0 |
| 128C | Kinematic Viscosity | -1.4 +1.4 | 0.05 | TOT | 305 | 0 1 |
| 129C | Kinematic Viscosity | +91.6 +94.4 | 0.05 | TOT | 305 | 0 93.3 94 |
| 130C | Tank | -7 +105 | 0.5 | TOT | 303 | 0 35 70 105 |
| 132C | Kinematic Viscosity | +148.6 +151.4 | 0.05 | TOT | 305 | 0 150 151 |
| 133C | Bending Beam Rheometer | -38 +2 | 0.1 | 76 mm | 379 | -36 -30 -24 -18 -12 -6 0 |
| 134C | Sludge | +144 +156 | 0.2 | 100 mm | 270 | 145 150 155 |
| 135C | Fuel Rating Air-High | +38 +93 | 1 | 40 mm | 171 | 50 90 |
| 136C | Aviation Fuel Density | -20 +60 | 0.2 | TOT | 290 | -20 -10 0 10 20 30 40 50 60 |
| 137C | Oxidation Cell Te | +80 +100 | 0.1 | 76 mm | 255 | 80 90 100 |

## A.S.T.M.°C / IP °C Correspondences

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTM | 2 | 3 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 18 | 22 | 28 | 29 | 33 | 34 |
| IP | 62 | 73 | 1 | 2 | 5 | 6 | 15 | 16 | 28 | 64 | 47 | 17 | 60 | 61 | 23 | 24 | 31 | 34 | 20 | 21 |
| ASTM | 35 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 54 | 61 | 72 | 73 | 74 | 102 | |
| IP | 59 | 77 | 78 | 79 | 80 | 81 | 82 | 65 | 29 | 30 | 66 | 35 | 90 | 18 | 63 | 67 | 68 | 69 | 83 | |
| ASTM | 103 | 104 | 105 | 106 | 107 | 110 | 113 | 114 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 132 | |
| IP | 84 | 85 | 86 | 87 | 88 | 93 | 89 | 14 | 92 | 32 | 94 | 95 | 96 | 97 | 71 | 99 | 33 | 36 | 102 | |

Official or Traceable Calibration Certificate upon request

## T 016 A.S.T.M °F Series

| A.S.T.M | | Range °F | Div. °F | Imm. | mm | Control points °F |
|---|---|---|---|---|---|---|
| 1F | Partial immersion | 0 +302 | 2 | 76 mm | 327 | 0 32 122 212 302 |
| 2F | Partial immersion | +20 +580 | 2 | 76 mm | 395 | 32 150 300 450 580 |
| 3F | Partial immersion | +20 +760 | 2 | 76 mm | 420 | 32 200 370 540 700 |
| 5F | Cloud and Pour | -36 +120 | 2 | 108 mm | 235 | -30 32 120 |
| 6F | Low Cloud and Pour | -112 +70 | 2 | 76 mm | 235 | -94 -30 32 70 |
| 7F | Low Distillation | +30 +580 | 2 | TOT | 390 | 32 100 200 300 400 500 570 |
| 8F | High Distillation | +30 +760 | 2 | TOT | 390 | 32 200 370 540 700 |
| 9F | Low Pensky-Martens | +20 +230 | 1 | 57 mm | 295 | 32 100 160 220 |
| 10F | High Pensky-Martens | +200 +700 | 5 | 57 mm | 295 | 212 390 570 700 |
| 11F | Cleveland Open Flash | +20 +760 | 5 | 25 mm | 315 | 32 200 370 540 700 |
| 12F | Density-Wide Range | -5 +215 | 0.5 | TOT | 425 | -5 15 32 60 85 110 135 160 185 210 |
| 14F | Wax Melting Point | +100 +180 | 0.2 | 79 mm | 380 | 100 120 140 160 180 |
| 15F | Low Softening Point | +30 +180 | 0.5 | TOT | 400 | 32 70 100 140 180 |
| 16F | High Softening Point | +85 +392 | 1 | TOT | 400 | 90 140 190 240 290 340 390 |
| 17F | Saybolt Viscosity | +66 +80 | 0.2 | TOT | 280 | 70 77 |
| 18F | Reid vapour pressure | +94 +108 | 0.2 | TOT | 280 | 100 107 |
| 19F | Saybolt Viscosity | +120 +134 | 0.2 | TOT | 280 | 122 130 |
| 20F | Saybolt Viscosity | +134 +148 | 0.2 | TOT | 280 | 140 147 |
| 21F | Saybolt Viscosity | +174 +188 | 0.2 | TOT | 280 | 180 187 |
| 22F | Oxidation Stability | +204 +218 | 0.2 | TOT | 280 | 210 212 |
| 28F | Kinematic Viscosity | +97.5 +102.5 | 0.1 | TOT | 310 | 32 100 102 |
| 29F | Kinematic Viscosity | +127.5 +132.5 | 0.1 | TOT | 310 | 32 130 132 |
| 30F | Kinematic Viscosity | +207.5 +212.5 | 0.1 | TOT | 310 | 32 210 212 |
| 33F | Low Aniline Point | -36.5 +107.5 | 0.5 | 50 mm | 425 | -31 -4 32 68 104 |
| 34F | Medium Aniline Point | +77 +221 | 0.5 | 50 mm | 425 | 77 113 149 185 212 |
| 35F | High Aniline Point | +194 +338 | 0.5 | 50 mm | 425 | 212 250 285 320 338 |
| 43F | Kinematic Viscosity | -61 -29 | 0.2 | TOT | 425 | -60 -50 -40 -30 32 |
| 44F | Kinematic Viscosity | +66.5 +71.5 | 0.1 | TOT | 310 | 32 68 70 |
| 45F | Kinematic Viscosity | 74.5 +79.5 | 0.1 | TOT | 310 | 32 77 79 |
| 46F | Kinematic Viscosity | +119.5 +124.5 | 0.1 | TOT | 310 | 32 122 124 |
| 47F | Kinematic Viscosity | +137.5 +142.5 | 0.1 | TOT | 310 | 32 140 142 |
| 48F | Kinematic Viscosity | +177.5 +182.5 | 0.1 | TOT | 310 | 32 180 182 |
| 50F | Gas Colorimeter Inlet | +54 +101 | 0.1 | TOT | 473 | 55 60 65 70 75 80 85 90 95 100 |
| 51F | Gas Colorimeter Outlet | +69 +116 | 0.1 | TOT | 473 | 70 75 80 85 90 95 100 105 110 115 |
| 54F | Congealing Point | +68 +213 | 0.5 | TOT | 315 | 70 120 170 210 |
| 56F | Bomb Calorimeter | +66 +95 | 0.05 | TOT | 600 | 66 70 74 78 82 88 92 95 |
| 57F | Tag Closed Tester Low R. | -4 +122 | 1 | 57 mm | 292 | -3 32 77 122 |
| 58F | Tank | -30 +120 | 1 | TOT | 305 | -20 32 80 120 |
| 59F | Tank | 0 +180 | 1 | TOT | 305 | 32 80 130 180 |
| 60F | Tank | +170 +500 | 2 | TOT | 305 | 212 350 490 |
| 61F | Petrolatum Melting Point | +90 +260 | 0.5 | 79 mm | 385 | 100 150 200 250 |
| 62F | Precision | -36 +35 | 0.2 | TOT | 384 | -35 -15 0 15 32 |
| 63F | Precision | +18 +89 | 0.2 | TOT | 384 | 20 32 50 70 88 |
| 64F | Precision | +77 +131 | 0.2 | TOT | 384 | 32 80 95 115 130 |
| 65F | Precision | +122 +176 | 0.2 | TOT | 384 | 32 125 145 160 175 |
| 66F | Precision | +167+221 | 0.2 | TOT | 384 | 32 168 185 200 220 |
| 67F | Precision | +203 +311 | 0.5 | TOT | 384 | 32 205 240 275 310 |
| 68F | Precision | +293 +401 | 0.5 | TOT | 384 | 32 300 340 370 400 |
| 69F | Precision | +383 +581 | 1 | TOT | 384 | 32 400 460 520 580 |
| 70F | Precision | +563 +761 | 1 | TOT | 384 | 32 570 640 700 760 |
| 71F | Oil in Wax | -35 +70 | 1 | 76 mm | 360 | -30 0 32 70 |
| 72F | Kinematic Viscosity | -2.5 +2.5 | 0.1 | TOT | 310 | -2 0 32 |
| 73F | Kinematic Viscosity | -42.5 -37.5 | 0.1 | TOT | 310 | -42 -40 32 |
| 74F | Kinematic Viscosity | -67.5 -62.5 | 0.1 | TOT | 310 | -67 -65 32 |
| 75F | Coolant (Antif.) Fr. Pt. | -35 +35 | 0.5 | 100 mm | 413 | -35 0 32 |
| 76F | Coolant (Antif.) Fr. Pt. | -65 +5 | 0.5 | 100 mm | 413 | -65 -30 5 |
| 77F | Saybolt Viscosity | +245 +265 | 0.5 | TOT | 280 | 250 260 |
| 78F | Saybolt Viscosity | +295 +315 | 0.5 | TOT | 280 | 300 310 |
| 79F | Saybolt Viscosity | +345 +365 | 0.5 | TOT | 280 | 350 360 |
| 80F | Saybolt Viscosity | +395 +415 | 0.5 | TOT | 280 | 400 410 |
| 81F | Saybolt Viscosity | +445 +465 | 0.5 | TOT | 280 | 450 460 |
| 82F | Fuel Rating, Engine | 0 +220 | 2 | 30 mm | 165 | 32 100 200 |
| 83F | Fuel Rating, Air | +60 +160 | 1 | 40 mm | 174 | 85 135 |
| 84F | Fuel Rating, Orifice Tank | +75 +175 | 1 | 249 mm | 387 | 100 150 |
| 85F | Fuel Rating, Surge | +100 +300 | 2 | 181 mm | 314 | 150 250 |
| 86F | Fuel Rating, Mix | +200 +350 | 2 | 35 mm | 170 | 225 325 |
| 87F | Fuel Rating, Coolant | +300 +400 | 1 | 40 mm | 175 | 300 400 |
| 88F | Vegetable Oil Flash | +50 +392 | 2 | 57 mm | 292 | 110 212 300 392 |
| 97F | Tank | 0 +120 | 1 | TOT | 305 | 0 32 70 110 |
| 98F | Tank | +60 +180 | 1 | TOT | 305 | 60 100 140 180 |
| 99F | Weathering Test | -58 +41 | 0.5 | 35 mm | 305 | -50 -25 0 32 |
| 108F | Saybolt Viscosity | +270 +290 | 0.5 | TOT | 280 | 275 285 |
| 109F | Saybolt Viscosity | +320 +340 | 0.5 | TOT | 280 | 325 335 |
| 110F | Kinematic Viscosity | +272.5 +277.5 | 0.1 | TOT | 310 | 32 275 277 |
| 113F | Soft.P.(Bitumen) Wide R. | +30 +350 | 1 | TOT | 410 | 32 122 212 302 347 |
| 118F | Kinematic Viscosity | +83.5 +88.5 | 0.1 | TOT | 310 | 32 86 88 |
| 119F | Coolant (Antif.) Fr. Pt. | -37 -22 | 0.2 | TOT | 425 | -36 -22 32 |
| 126F | Kinematic Viscosity | -17.5 -12.5 | 0.1 | TOT | 310 | -17 -15 32 |
| 128F | Kinematic Viscosity | +29.5 +34.5 | 0.1 | TOT | 310 | 32 34 |
| 129F | Kinematic Viscosity | +197.5 +202.5 | 0.1 | TOT | 310 | 32 200 202 |
| 130F | Tank | +20 +220 | 1 | TOT | 305 | 32 100 160 220 |
| 135F | Fuel Rating, Air-High | +100 +200 | 1 | 40 mm | 168 | 125 195 |
| 136F | Aviation Fuel Density | -5 +140 | 0.5 | TOT | 285 | -5 15 32 60 85 110 135 |

# RUSSIAN

GOST TRACEABLE

## STANDARDIZED THERMOMETERS
## ТИН (TIN) - ТН (TN) - ТЛ (TL)

### ТИН THERMOMETERS

**Registered by the Russian State.**
**Certificate N° 27660.**

T 017 ①

| N° ТИН | Range °C | Div. °C | Imm. | mm | A.S.T.M Equivalence |
|---|---|---|---|---|---|
| ТИН 2-2 | +39 +54 | 0.2 | 90 mm | 237 | 24C |
| ТИН 2-3 | +95 +105 | 0.2 | 90 mm | 212 | 25C |
| ТИН 3-1 | -38 +50 | 1 | 108 mm | 230 | 5C |
| ТИН 3-3 | -80 +20 | 1 | 76 mm | 230 | 6C |
| ТИН 4-1 | -2 +400 | 1 | TOT | 385 | 8C |
| ТИН 4-2 | -2 +300 | 1 | TOT | 385 | 7C |
| ТИН 7-2 | +25 +105 | 0.2 | 50 mm | 420 | 34C |
| ТИН 7-3 | +90 +170 | 0.2 | 50 mm | 420 | 35C |
| ТИН 7-4 | -38 +42 | 0.2 | 50 mm | 420 | 33C |
| ТИН 8 | -80 +20 | 0.5 | TOT | 300 | 114C |
| ТИН 10-1 | +18,6 +21,4 | 0.05 | TOT | 305 | 44C |
| ТИН 10-2 | +36,6 +39,4 | 0.05 | TOT | 305 | 28C |
| ТИН 10-3 | +48,6 +51,4 | 0.05 | TOT | 305 | 46C |
| ТИН 10-4 | +98,6 +101,4 | 0.05 | TOT | 305 | 121C |
| ТИН 10-7 | +23,6 +26,4 | 0.05 | TOT | 305 | 45C |
| ТИН 10-8 | +38,6 +41,4 | 0.05 | TOT | 305 | 120C |
| ТИН 12 | +34 +42 | 0.1 | TOT | 275 | 18C |

1


**Every standardized thermometer has an individual serial number.**

**The serial number and the standard are printed on the back of the instrument.**

2

STANDARD

### GOST 400-80
### ТН - ТЛ THERMOMETERS

**Registered by the Russian State.**
**Certificate N° 27661.**

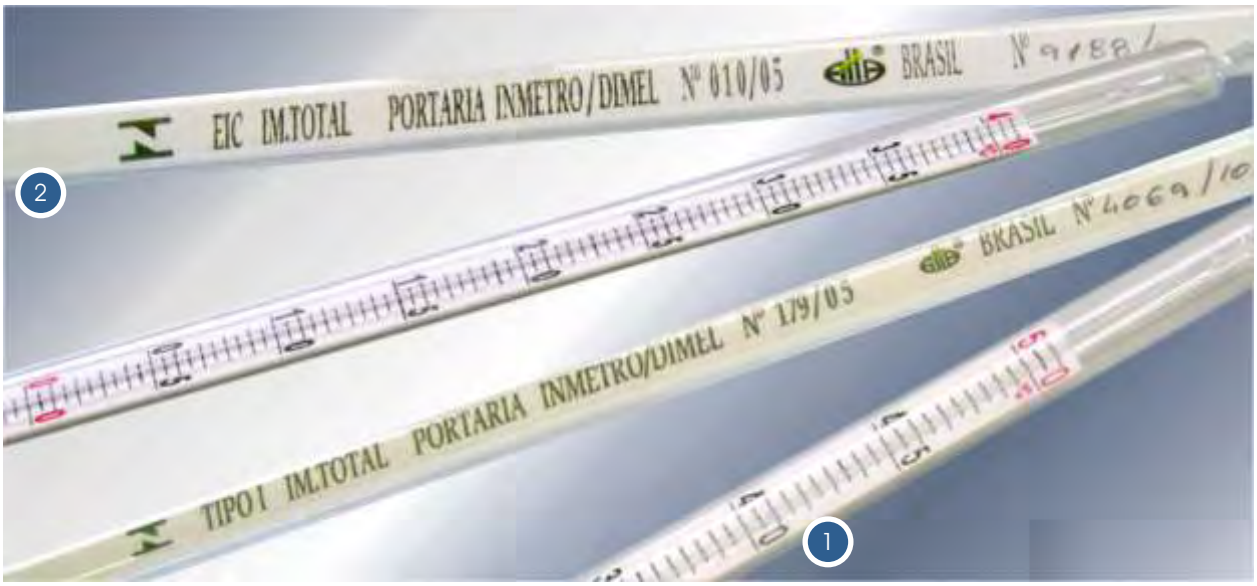
T 018 ②

| Type | Range °C | Div. °C | mm | Ø |
|---|---|---|---|---|
| ТН-6 | -30+60 | 1 | 300 ±10 | 10 ±1 |
| ТН-8М | -80+60 | 1 | 400 ±10 | 11 ±1 |
| ТЛ4-2 | 0+55 | 0.1 | 500/530 | 11/12 |

# BRAZILIAN

INMETRO TRACEABLE

## STANDARDIZED THERMOMETERS TIPO - EIC




STANDARD

These products for quality control of fuels are manufactured to **INMETRO/DIMEL** standard and are in accordance with the agreements established by the RTM Brazilian (Regulamento Tecnico) Portaria **N° 245/2000**.

### TIPO THERMOMETERS
**FOR OIL and its derivatives in liquid**

Mercury liquid filling.
They are calibrated for total immersion.
Available with internal or external scales.
**Agreement N°128/2001** (external scale)
**Agreement N°179/2005** (internal scale)

EO EU
Official or Traceable Calibration Certificate upon request

**T 019** ①

| | Range °C | Scale | Accuracy °C | Ø mm. | mm |
|---|---|---|---|---|---|
| Div. 0.5°C | -10+50 | Internal | 0.5 | 9 | 340 |
| | -10+50 | External | 0.5 | 6.20 | 315 |


### EIC THERMOMETERS
**FOR ETHANOL and its water solution**

Mercury liquid filling.
They are calibrated for total immersion.
Available with internal or external scales.
**Agreements N°049/2009 - N°010/2005 - N°137/2001**

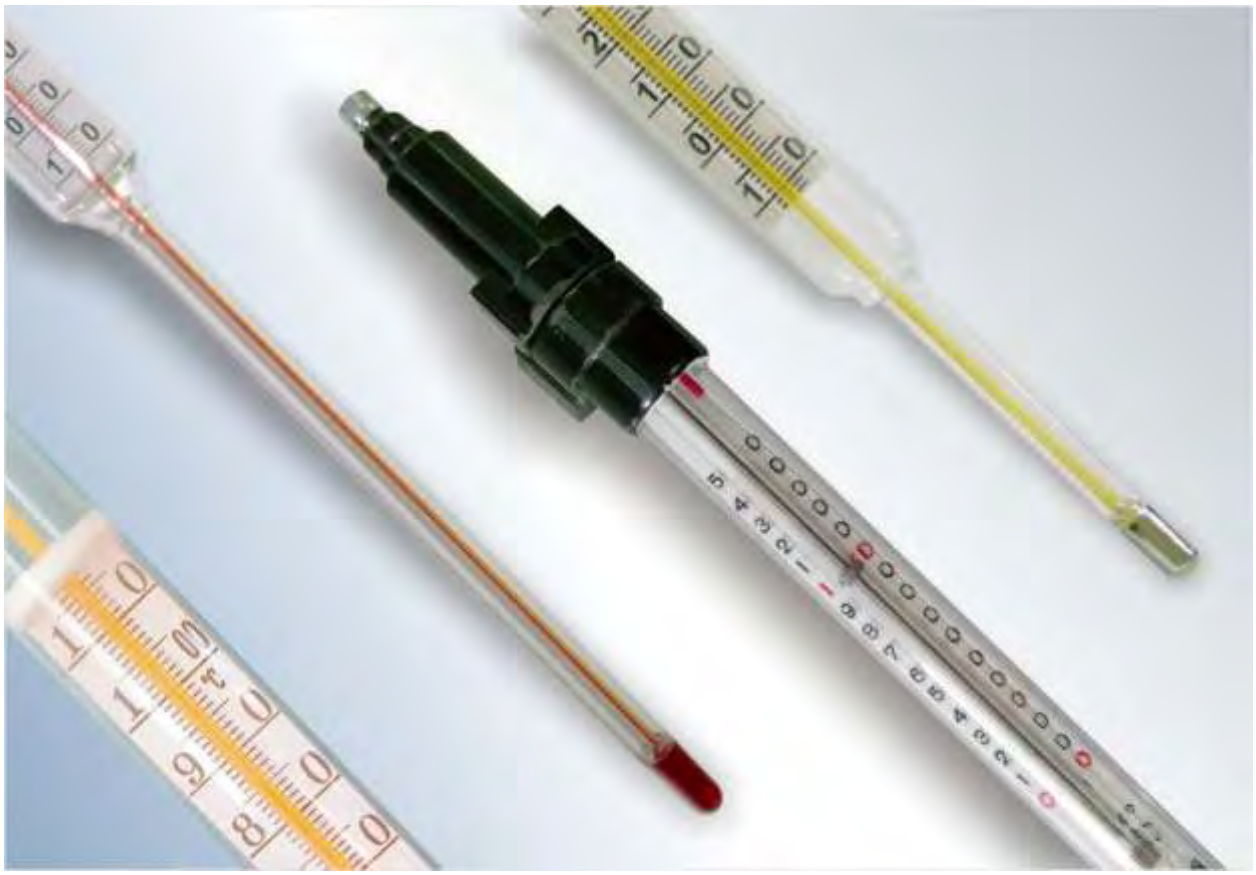
EO EU
Official or Traceable Calibration Certificate upon request

**T 020** ②

| | Range °C | Scale | Accuracy °C | Ø mm. | mm |
|---|---|---|---|---|---|
| Div. 0.5°C | -10+40 | Internal | 0.5 | 9 | 250 |
| | -10+50 | Internal | 0.5 | 9 | 340 |
| | -10+40 | External | 0.5 | 6.20 | 315 |

# INDUSTRIAL & CONTACT

## THERMOMETERS



### INDUSTRIAL THERMOMETERS

**Upper body:** diameter standard 20 mm.
other diameter possible: 13, 15, 17, 24, 32 mm (±1 mm).

**Lower stem:** - diameter standard 7 mm (length until 700 mm).
diameter standard 10/11 mm (length over 700 mm).
- length in 50 mm increments, possible up to and over 2500 mm (100, 150, 200, 250, 300...).

**Reflecting capillary:** yellow standard reflecting. Clear reflecting capillaries available upon request.

**Immersion:** for our standard industrial thermometers, the immersion is the length of the lower stem.
other immersions possible upon request.

More details on the immersions types of thermometers in page 7
or on our website page www.allafrance.com/help.html

**INFO** Special or angled thermometers on request. Generally the angles are 45° or 90° which must be specified on the purchase order. In every case we require a plan.

**These thermometers are not available with Calibration Certificates**

## INDUSTRIAL THERMOMETERS

The details given below should only be used as a guide.

We have tried to define some standard parameters, by using standard specifications such as **AFNOR B 37-003 and DIN 16-174** with the aim of reducing delivery delays, and increasing customer satisfaction.

1

## CONTACT THERMOMETERS

Double scale models (2)

The filling liquid is Mercury.

Adjustment is made by means of a rotating magnet, which can be locked by a screw, so maintaining the setting (3)
Easy connection by means of an isolated and protected plug.

Standard lower part lengths from 50 to 300 mm.
(to specify on the purchase order)

**T 023**

| Range °C | Div °C | Lower part mm. |
|---|---|---|
| 0+100 | 0.1 | 50 at 300 |
| 0+50 | 0.2 | 50 at 300 |
| 0+100 | 0.2 | 50 at 300 |
| 0+50 | 0.5 | 50 at 300 |
| 0+100 | 0.5 | 50 at 300 |
| 0+150 | 0.5 | 50 at 300 |
| 0+50 | 1 | 50 at 300 |
| 0+100 | 1 | 50 at 300 |
| 0+150 | 1 | 50 at 300 |
| 0+200 | 1 | 50 at 300 |
| 0+250 | 1 | 50 at 300 |
| 0+300 | 1 | 50 at 300 |
| -38+40 | 1 | 50 at 300 |
| 0+200 | 2 | 50 at 300 |
| 0+250 | 2 | 50 at 300 |
| 0+300 | 2 | 50 at 300 |

**T 021** **Industrial thermometers with red liquid** (1)

| Range °C | Div °C | Upper body mm |
|---|---|---|
| -10+60 | 1 | 200 |
| -10+110 | 1 | 200 |
| -10+150 | 1 | 200 |
| -30+110 | 1 | 200 |
| -50+50 | 1 | 200 |
| -80+50 | 1 | 200 |
| -100+30 | 1 | 200 |

**T 022** **Industrial thermometers with mercury filling**

| Range °C | Div °C | Upper body mm |
|---|---|---|
| -10+60 | 1 | 200 |
| -10+110 | 1 | 200 |
| -10+150 | 1 | 200 |
| -10+200 | 1 | 250 |
| -30+110 | 1 | 200 |
| -10+250 | 2 | 200 |
| -10+300 | 2 | 250 |
| -10+360 | 2 | 250 |
| -10+420 | 5 | 200 |
| -10+480 | 5 | 200 |

2

3

# VARIOUS
## THERMOMETERS


### MAXIMUM READING SWINGING THERMOMETERS

Solid stem thermometers.
The mercury column is stabilized at the maximum temperature. Before performing a new test, the mercury column must be brought back down to ambiente temperature by shaking the thermometer.

**T 024** ①

| | Range °C | Imm. | mm |
|---|---|---|---|
| Div. 1°C | -10+110 | TOT | 260 |
| | -10+150 | TOT | 260 |
| | -10+250 | TOT | 300 |

### STEM THERMOMETER for battery

The glass used has a diameter of 6.5-7mm

**T 025**

| Red liquid | Range °C | Imm. mm | mm |
|---|---|---|---|
| Div. 1°C | -10+70°C | 90/100 | 255 |

### INTERNAL SCALE THERMOMETERS

The glass used has a diameter of about 8-10 mm.
With suspension ring.
Other divisions are available upon request :
0.1°C / 0.2°C / 0.5°C.

**T 026** ②

| | Range °C | Accuracy °C | Imm. | mm |
|---|---|---|---|---|
| **Red liquid** Div. 1°C | -10+60 | 1 | TOT | 200 |
| | -10+110 | 1 | TOT | 260 |
| | -10+150 | 1 | TOT | 260 |
| **Mercury** Div. 1°C | -10+60 | 1 | TOT | 200 |
| | -10+110 | 1 | TOT | 260 |
| | -10+150 | 1 | TOT | 260 |
| | -10+250 | 1.5 | TOT | 300 |
| | -10+360 | 1.5 | TOT | 340 |

### WET & DRY THERMOMETERS

Thermometer in plastic with red liquid.
The table printed on the instrument is used to calculate humidity from the difference between the wet and dry bulb temperatures at a given temperature.

**T 027** ③

| | Range °C | Accuracy °C | mm |
|---|---|---|---|
| Div. 1°C | -10+50 | 1 | 300x75 |
| | 0+100 | 2 | 300x75 |

### LIQUID CRYSTAL THERMOMETERS

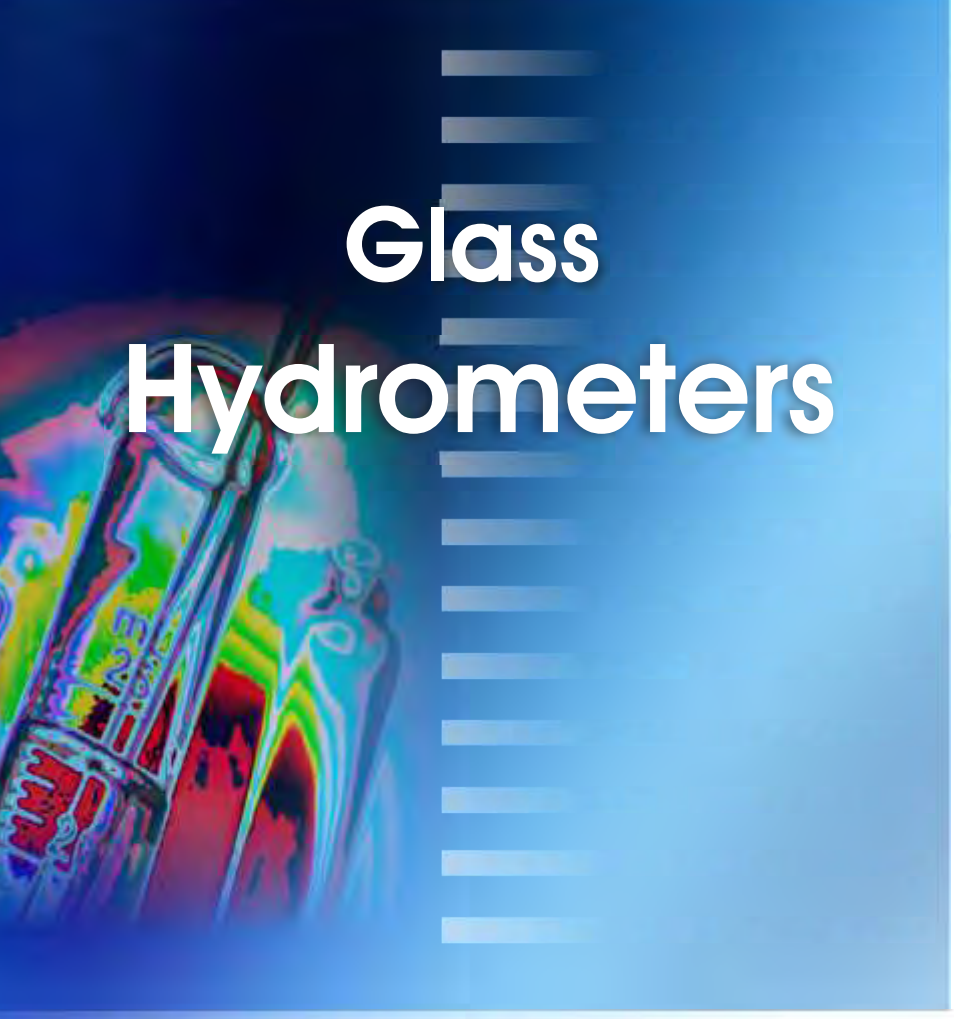
**T 028** Self adhesive ④

| | Range °C | Models | mm |
|---|---|---|---|
| Div. 1°C | +18+34 * | vertical | 132x14 |
| | +18+34 | vertical | 132x20 |
| Div. 2°C | 0+12 | vertical | 132x20 |
| | +10+40 | vertical | 132x20 |
| | +16+40 | horizontal | 101x12 |
| Div. 3°C | -24-3 | vertical | 132x20 |

(*) In blister

**Other thermometers in our specific catalogue**
**Catering & food Industry**

# Glass Hydrometers



Hydrometers

# EUROPEAN

MRA TRACEABLE

## STANDARDIZED HYDROMETERS ISO, BS, DIN, NF ...


- **Scale**
  The scale of the hydrometer is fully marked with all the reference norms, the calibration temperature, the superficial tensions, the individual number of the instrument, the serial number and the France logo.

- **Benchmark**
  Engraved on the stem to show any displacement of the scale (see page 8).

- **Calibration and Certificates**
  Our official masters are regularly controlled and are traceable in over 68 countries worldwide (see page 5).

More information about the signatory countries on
http://www.european-accreditation.org/content/mla/scopes.htm

Available, upon request with an ALLA FRANCE EU Traceable Calibration Certificate, or an EO Official Calibration Certificate controlled by an accredited European Laboratory (see pages 4-5 for more information about Certificates).

**Systematically delivered with a Traceability and Conformity Certificate**

**High temperature calibration upon request** (see page 43)

HELP

The link of our page www.allafrance.com/help.html is printed on the body of our hydrometers and accessible to the user. This page answers most metrological questions asked and allows you to limit repetitive questions to your Customer Service, while being a solid support for your sales force.

## NF T 60101
### PETROLEUM INDUSTRY

They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

EO EU
Official or Traceable Calibration Certificate upon request

**D 010 — M50 Series**

| | | Range g/ml |
|---|---|---|
| Temp. | 15 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Division | 0.001 g/ml | |
| Accuracy | 0.001 g/ml | |
| Length | 270 mm | |

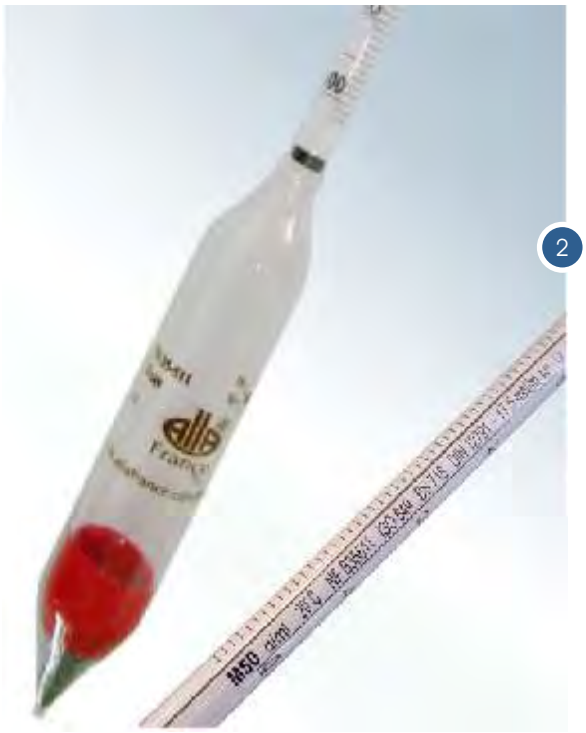
**D 011 — S50 Series**

| | | Range g/ml |
|---|---|---|
| Temp. | 15 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Division | 0.001 g/ml | |
| Accuracy | 0.001 g/ml | |
| Length | 190 mm | |

**D 012 — L50 Series** ①

| | | Range g/ml |
|---|---|---|
| Temp. | 15 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Division | 0.0005 g/ml | |
| Accuracy | 0.0005 g/ml | |
| Length | 335 mm | |


1




2

## ISO 649 - NF B35511 - BS 718 - DIN 12791
### PETROLEUM INDUSTRY

They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

EO EU
Official or Traceable Calibration Certificate upon request

**D 013 — M50 - SP Series** ②

| | | Range g/ml |
|---|---|---|
| Temp. | 20 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Division | 0.001 g/ml | |
| Accuracy | 0.0006 g/ml | |
| Length | 270 mm | |

**D 014 — S50 - SP Series**

| | | Range g/ml |
|---|---|---|
| Temp. | 20 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Division | 0.001 g/ml | |
| Accuracy | 0.001 g/ml | |
| Length | 190 mm | |

**D 015 — L50 - SP Series**

| | | Range g/ml |
|---|---|---|
| Temp. | 20 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Division | 0.0005 g/ml | |
| Accuracy | 0.0003 g/ml | |
| Length | 335 mm | |

**D 016 — BS 718 SP — Aviation fuel**

| | | Range g/ml |
|---|---|---|
| Temp. | 15 °C and 20°C | 0.775 - 0.825 |
| Division | 0.001 g/ml | |
| Accuracy | 0.0006 g/ml | |
| Length | 270 mm | |

## ISO 649 - NF B35511 - BS 718 - DIN 12791
### Density hydrometers (g/ml)
### GENERAL PURPOSE

They are calibrated according to the following surface tensions:
from 0.600 to 1.000 g/ml= 16 at 35 mN/m (low tension)
from 1.000 to 1.300 g/ml= 55 mN/m (medium tension)
from 1.300 to 2.000 g/ml= 75 mN/m (high tension)
Reading below meniscus.

Official or Traceable Calibration Certificate upon request

**D 001 — M100 Series**

| Temp. | 20 °C | Range g/ml |
|---|---|---|
| Division | 0.002 g/ml | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... |
| Accuracy | 0.002 g/ml | ↓ |
| Length | 250 mm | ..... - 1.900<br>1.900 - 2.000 |

**D 002 — S50 Series**

| Temp. | 20 °C | Range g/ml |
|---|---|---|
| Division | 0.002 g/ml | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... |
| Accuracy | 0.002 g/ml | ↓ |
| Length | 190 mm | ..... - 1.950<br>1.950 - 2.000 |

**D 003 — M50 Series** ①

| Temp. | 20 °C | Range g/ml |
|---|---|---|
| Division | 0.001 g/ml | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... |
| Accuracy | 0.001 g/ml | ↓ |
| Length | 270 mm | ..... - 1.950<br>1.950 - 2.000 |

**D 004 — L50 Series**

| Temp. | 20 °C | Range g/ml |
|---|---|---|
| Division | 0.0005 g/ml | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... |
| Accuracy | 0.0005 g/ml | ↓ |
| Length | 335 mm | ..... - 1.950<br>1.950 - 2.000 |

**D 005 — L20 Series**

| Temp. | 20 °C | Range g/ml |
|---|---|---|
| Division | 0.0002 g/ml | 0.600 - 0.620<br>0.620 - 0.640<br>0.640 - ..... |
| Accuracy | 0.0002 g/ml | ↓ |
| Length | 335 mm | ..... - 1.980<br>1.980 - 2.000 |

When an **ISO 650** hydrometer has an equivalent **ASTM** hydrometer, both standards are printed on the back of the instrument.


## ISO 650
### Specific Gravity hydrometers (Sp.Gr)
### GENERAL PURPOSE

They are calibrated according to the following surface tensions:
from 0.600 at 1.000 Sp.Gr = 16 at 35 mN/m (low tension)
from 1.000 at 1.300 Sp.Gr = 55 mN/m (medium tension)
from 1.300 at 2.000 Sp.Gr = 75 mN/m (high tension)
Reading below meniscus.

Official or Traceable Calibration Certificate upon request

**D 006 — M100 Series** ②

| Temp. | 60/60°F | Range Sp.Gr |
|---|---|---|
| Division | 0.002 Sp.Gr | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... |
| Accuracy | 0.002 Sp.Gr | ↓ |
| Length | 250 mm | ..... - 1.900<br>1.900 - 2.000 |

**D 007 — S50 Series**

| Temp. | 60/60°F | Range Sp.Gr |
|---|---|---|
| Division | 0.002 Sp.Gr | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... |
| Accuracy | 0.002 Sp.Gr | ↓ |
| Length | 190 mm | ..... - 1.950<br>1.950 - 2.000 |

**D 008 — M50 Series**

| Temp. | 60/60°F | Range Sp.Gr |
|---|---|---|
| Division | 0.001 Sp.Gr | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... |
| Accuracy | 0.001 Sp.Gr | ↓ |
| Length | 270 mm | ..... - 1.950<br>1.950 - 2.000 |

**D 009 — L50 Series**

| Temp. | 60/60°F | Range Sp.Gr |
|---|---|---|
| Division | 0.0005 Sp.Gr | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... |
| Accuracy | 0.0005 Sp.Gr | ↓ |
| Length | 335 mm | ..... - 1.950<br>1.950 - 2.000 |

## ISO 649 - NF B35511 - BS 718 - DIN 12791
## A.S.T.M. method D1298
### PETROLEUM INDUSTRY

They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

EO EU
Official or Traceable Calibration Certificate upon request

**D 017** **M50 - SP Series**

| | | |
|---|---|---|
| Temp. | 15 °C | Range g/ml |
| Division | 0.001 g/ml | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Accuracy | 0.0006 g/ml | |
| Length | 270 mm | |

**D 018** **S50 - SP Series**

| | | |
|---|---|---|
| Temp. | 15 °C | Range g/ml |
| Division | 0.001 g/ml | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Accuracy | 0.001 g/ml | |
| Length | 190 mm | |

**D 019** **L50 - SP Series**

| | | |
|---|---|---|
| Temp. | 15 °C | Range g/ml |
| Division | 0.0005 g/ml | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - .....<br>↓<br>..... - 1.050<br>1.050 - 1.100 |
| Accuracy | 0.0003 g/ml | |
| Length | 335 mm | |

## NF 41008 - DIN 12804 - ISO 3993
### OIL AND GAS INDUSTRY

These instruments are designed for the control of gas, such as butane and propane.
They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

**D 020** **NF 41008**

| | | | |
|---|---|---|---|
| Temp. | 15 °C | Series | Range g/ml |
| Division | 0.001 g/ml | PRO-050TH | 0.500 - 0.550 |
| Accuracy | 0.001 g/ml | BUT-055TH | 0.550 - 0.600 |
| Length | 350 mm | | |

**D 021** **DIN 12804**

| | | | |
|---|---|---|---|
| Temp. | 15 °C | Series | Range g/ml |
| Division | 0.0005 g/ml | T1 | 0.500 - 0.550 |
| Length | 330 mm | T2 | 0.550 - 0.600 |
| | | T3 | 0.600 - 0.650 |

**D 022** **ISO 3993**

| | | | |
|---|---|---|---|
| Temp. | 15 °C | Series | Range g/ml |
| Division | 0.001 g/ml | ISO-050 | 0.500 - 0.580 |
| Length | 330 mm | ISO-057 | 0.570 - 0.650 |

## ECE/ENERGY/19
### DRAFT SURVEY HYDROMETERS

For determining the apparent density (in air) of seawater or fresh water.
Used for ship draft survey calculations.
Medium surface tension (55 mN/m).

EO EU
Official or Traceable Calibration Certificate upon request

**D 023** ①

| | | |
|---|---|---|
| Temp. | 15 °C | Range kg/l |
| Division | 0.0005 kg/l | 0.990 - 1.040 |
| Accuracy | 0.0005 kg/l | |
| Length | 335 mm | |

## BS 1377
### SOIL HYDROMETERS

They are calibrated for medium surface tension (55 mN/m). Reading below meniscus.

**D 024** ②

| | | |
|---|---|---|
| Temp. | 20 °C | Range g/ml |
| Division | 0.001 g/ml | 0.995 - 1.030 |
| Accuracy | 0.001 g/ml | |
| Length | 280 mm | |

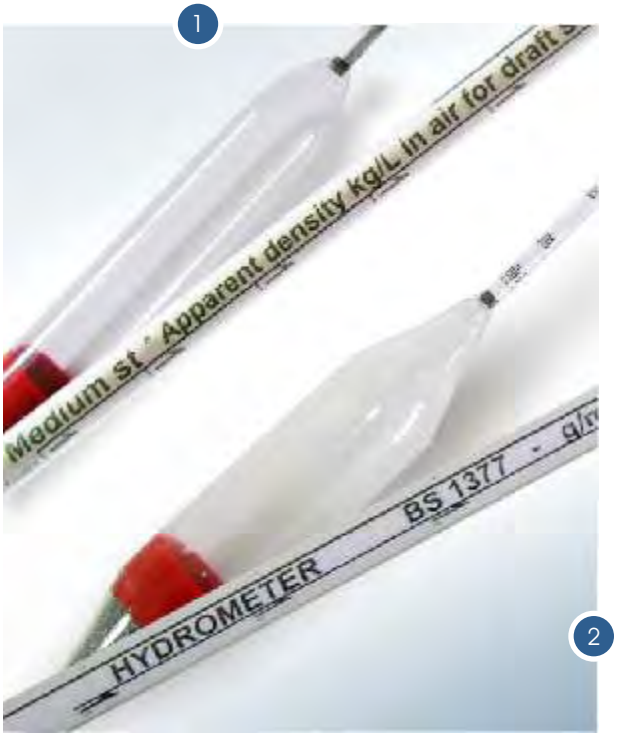
## BS 734 & NF B 35 522
### MILK HYDROMETERS

They are calibrated for medium surface tension (45 mN/m). Reading upper meniscus.

**D 025**

| | | |
|---|---|---|
| Temp. | 20 °C | Range g/ml |
| Division | 0.0002 or 0.0005 g/ml | 1.015 - 1.025 |
| Accuracy | 0.0002 or 0.0005 g/ml | 1.025 - 1.035 |
| Length | 240 or 250 mm | 1.035 - 1.045 |

1




2

European standardized Hydrometers

www.allafrance.com

# U.S.A

## A2LA TRACEABLE STANDARDIZED HYDROMETERS A.S.T.M, °API ...


- **A.S.T.M.** is an American standard.
  These hydrometers are manufactured according to the standards from the last ASTM E100 Committee of the **AMERICAN SOCIETY FOR TESTING AND MATERIAL**.

- **Scale**
  The scale of the hydrometer is fully marked with all the reference norms, the calibration temperature, the superficial tensions, the individual number of the instrument, the serial number and the alla France logo.

When an **ASTM** hydrometer has an equivalent **ISO 650** hydrometer, both standards are printed on the back of the instrument.

**HELP**

The link of our page www.allafrance.com/help.html is printed on the body of our hydrometers and accessible to the user. This page answers most metrological questions asked and allows you to limit repetitive questions to your Customer Service, while being a solid support for your sales force.

- **Benchmark**
  Engraved on the stem to show any displacement of the scale (see page 8).

- **Calibration and Certificates**
  Our official masters are regularly controlled and are traceable in over 68 countries worldwide (see page 5).

More information about the signatory countries on
http://www.european-accreditation.org/content/mla/scopes.htm

**Systematically delivered with a Traceability and Conformity Certificate**

Available, upon request with an ALLA FRANCE EU Traceable Calibration Certificate, or an EO Official Calibration Certificate controlled by an accredited European Laboratory (see pages 4-5 for more information about Certificates).

## A.S.T.M. E100
## SPECIFIC GRAVITY HYDROMETERS (Sp.Gr)

Reading below meniscus.

Official or Traceable Calibration Certificate upon request

**D 026** Low surface tension ① (16 at 35 mN/m)

| | |
|---|---|
| Temp. | 60/60°F |
| Division | 0.0005 Sp.Gr |
| Accuracy | 0.0005 Sp.Gr |
| Length | 335 mm |

| Series | Range Sp.Gr |
|---|---|
| 82H62 | 0.650 - 0.700 |
| 83H62 | 0.700 - 0.750 |
| 84H62 | 0.750 - ..... |
| ↓ | ↓ |
| | ..... - 1.050 |
| 90H62 | 1.050 - 1.100 |

**D 027** Medium surface tension (55 mN/m)

| | |
|---|---|
| Temp. | 60/60°F |
| Division | 0.0005 Sp.Gr |
| Accuracy | 0.0005 Sp.Gr |
| Length | 335 mm |

| Series | Range Sp.Gr |
|---|---|
| 98H62 | 0.950 - 1.000 |
| 111H62 | 1.000 - 1.050 |
| 112H62 | 1.050 - ..... |
| ↓ | ↓ |
| | ..... - 1.450 |
| 120H62 | 1.450 - 1.500 |

**D 028** Medium and high surface tension

| | |
|---|---|
| Temp. | 60/60°F |
| Division | 0.001 Sp.Gr |
| Accuracy | 0.001 Sp.Gr |
| Length | 270 mm |

| Series | Range Sp.Gr |
|---|---|
| 102H62 | 0.650 - 0.700 |
| 103H62 | 0.700 - 0.750 |
| 104H62 | 0.750 - ..... |
| ↓ | ↓ |
| | ..... - 1.800 |
| 141H62 | 1.800 - 1.850 |

1


## A.S.T.M. E100 °API
## PETROLEUM INDUSTRY

They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

Official or Traceable Calibration Certificate upon request

**D 029**

| | |
|---|---|
| Temp. | 60/60°F |
| Division | 0.1 °API |
| Accuracy | 0.1 °API |
| Length | 335 mm |

| Series | Range °API |
|---|---|
| 1H62 | -1 - 11 |
| 2H62 | 9 - 21 |
| ↓ | ↓ |
| 9H62 | 79 - 91 |
| 10H62 | 89 - 101 |

**D 030**

| | |
|---|---|
| Temp. | 60/60°F |
| Division | 0.1 °API |
| Accuracy | 0.1 °API |
| Length | 168 mm |

| Series | Range °API |
|---|---|
| 21H62 | 0 - 6 |
| 22H62 | 5 - 11 |
| ↓ | ↓ |
| 39H62 | 90 - 96 |
| 40H62 | 95 - 101 |

2

**Thermometer in the body** : 2°F
0+150°F (or) +30+180°F (or) +60+220°F ②

**D 031**

| | |
|---|---|
| Temp. | 60/60°F |
| Division | 0.1 °API |
| Accuracy | 0.1 °API |
| Length | 387 mm |

| Series | Range °API |
|---|---|
| 41H62 | 15 - 23 |
| 42H62 | 22 - 30 |
| ↓ | ↓ |
| 59H62 | 79 - 91 |
| 60H62 | 89 - 101 |

**D 032** **Thermometer in the stem** : 2°F +30+220°F

| | |
|---|---|
| Temp. | 60/60°F |
| Division | 0.1 °API |
| Accuracy | 0.1 °API |
| Length | 387 mm |

| Series | Range °API |
|---|---|
| 71H62 | -1 - 11 |
| 72H62 | 9 - 21 |
| 73H62 | 19 - 31 |
| 74H62 | 29 - 41 |

## A.S.T.M. E100
### PETROLEUM INDUSTRY
**Canadian Government Agreement**

They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

EO EU
Official or Traceable Calibration Certificate upon request

**D 033** ①

| | | Series | Range kg/m³ |
|---|---|---|---|
| Temp. | 15°C | 311H | 600 - 650 |
| Division | 0.5 kg/m³ | 312H | 650 - ..... |
| Accuracy | 0.5 kg/m³ | ↓ | ↓ |
| Length | 330 mm | 319H | ..... - 1 050 |
| | | 320H | 1 050 - 1 100 |

**With thermometer in the body** : 1°C
-20+65°C (or) 0+85°C (or)+20+105°C

**D 034** ②

| | | Series | Range kg/m³ |
|---|---|---|---|
| Temp. | 15°C | 300H | 600 - 650 |
| Division | 0.5 kg/m³ | 301H | 650 - ..... |
| Accuracy | 0.5 kg/m³ | ↓ | ↓ |
| Length | 380 mm | 308H | ..... - 1 050 |
| | | 309H | 1 050 - 1 100 |

3

## A.S.T.M. D 422 (E100)
### SOIL HYDROMETERS

They are calibrated for medium surface tension (55 mN/m)
Reading below meniscus.

**D 038** ③

| | | Serie | Range Sp.Gr |
|---|---|---|---|
| Temp. | 68/68°F | 151H62 | 0.995 - 1.038 |
| Division | 0.001 Sp.Gr | | |
| Accuracy | 0.001 Sp.Gr | | |
| Length | 280 mm | | |

**D 039**

| | | Serie | Range g/l |
|---|---|---|---|
| Temp. | 68°F | 152H62 | -5 +60 |
| Division | 1 g/l | | |
| Accuracy | 1 g/l | | |
| Length | 280 mm | | |

## A.S.T.M. D287 - A.S.T.M. E100
### OIL AND GAS INDUSTRY

These instruments are designed for the control of gas, such as butane and propane.
They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

**D 035** **A.S.T.M. D287** (specific gravity)

| | | Series | Range Sp.Gr |
|---|---|---|---|
| Temp. | 60/60°F | D-050 | 0.500 - 0.580 |
| Division | 0.001 Sp.Gr or 0.0005 Sp.Gr | D-057 | 0.570 - 0.650 |
| Length | 330 mm | | |

**D 036** **A.S.T.M. E100** (specific gravity)
**with thermometer:** +30+60°F - HG

| | | Serie | Range Sp.Gr |
|---|---|---|---|
| Temp. | 60/60°F | 101H62 | 0.500 - 0.650 |
| Division | 0.001 Sp.Gr | | |
| Length | 387 mm | | |

**D 037** **A.S.T.M. E100**
**with thermometer:** 0+35°C - HG

| | | Serie | Range kg/m³ |
|---|---|---|---|
| Temp. | 15 °C | 310H | 500 - 650 |
| Division | 1 kg/m³ | | |
| Longueur | 387 mm | | |

# RUSSIAN

GOST TRACEABLE

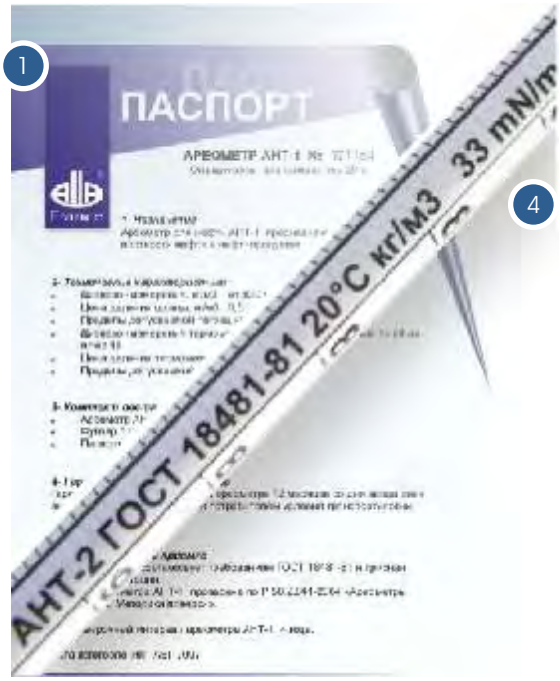
## STANDARDIZED HYDROMETERS AH (AN), AHT-1 (ANT-1), AHT-2 (ANT-2)


STANDARD

These hydrometers are **registered by the Russian State.**
**Certificate N° 33218** ①

### Scale
The scale of the hydrometer is fully marked with all the reference norms, the calibration temperature, the surface tensions and the individual number.

### Benchmark
Engraved on the stem to show any displacement of the scale (see page 8).




### PETROLEUM INDUSTRY
They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

**D 040** **AH Series** ②

| | | Range kg/m³ |
|---|---|---|
| Temp. | 15°C or 20°C | 650 - 680<br>680 - 710<br>710 - .....<br>↓<br>..... - 1040<br>1040 - 1070 |
| Division | 0.5 kg/m³ | |
| Accuracy | 0.5 kg/m³ | |
| Length | 300 mm | |

### PETROLEUM INDUSTRY WITH THERMOMETER
Red liquid thermometer -20+45°C : 1°C
Reading below meniscus.

**D 041** **AHT-1 Series** ③

| | | Range kg/m³ |
|---|---|---|
| Temp. | 15°C or 20°C | 650 - 710<br>710 - 770<br>770 - .....<br>↓<br>..... - 1010<br>1010 - 1070 |
| Division | 0.5 kg/m³ | |
| Accuracy | 0.5 kg/m³ | |
| Length | 500 mm | |

Red liquid thermometer -20+35°C : 1°C
Reading below meniscus.

**D 042** **AHT-2 Series** ④

| | | Range kg/m³ |
|---|---|---|
| Temp. | 15°C or 20°C | 670 - 750<br>750 - 830<br>830 - 910<br>910 - 990 |
| Division | 1 kg/m³ | |
| Accuracy | 1 kg/m³ | |
| Length | 300 mm | |

# BRAZILIAN

INMETRO TRACEABLE

## STANDARDIZED HYDROMETERS DP - DA


1

STANDARD

These products for quality control of fuels are manufactured to **INMETRO/DIMEL** standard and are in accordance with the agreements established by the Brazilian RTM (Regulamento Tecnico) Portaria **N° 201/2000**.

### INMETRO/DIMEL agreements N° 132/2001
**FOR OIL and its derivatives in liquid**

They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

EO EU
Official or Traceable Calibration Certificate upon request

**D 043** **DP - L50 Series** ①

| | | Range g/ml |
|---|---|---|
| Temp. | 20 °C | |
| Division | 0.0005 g/ml | 0.700 - 0.750<br>0.750 - .....<br>.....<br>..... - 0.850<br>0.850 - 0.900 |
| Accuracy | 0.0005 g/ml | |
| Length | 335 mm | |

### INMETRO/DIMEL agreements N° 129/2001
**FOR ETHANOL FUEL and water solutions**

They are calibrated for a low surface tension (between 16 and 35 mN/m).
Reading below meniscus.

EO EU
Official or Traceable Calibration Certificate upon request

**D 044** **DA - L50 Series** ②

| | | Range g/ml |
|---|---|---|
| Temp. | 20 °C | |
| Division | 0.0005 g/ml | 0.750 - 0.800<br>0.800 - 0.850 |
| Accuracy | 0.0005 g/ml | |
| Length | 335 mm | |

# COMMERCIAL GRADE
## HYDROMETERS

### COMMERCIAL GRADE
**Density hydrometers (g/ml)**
Reading below meniscus.

**D 045** **Range finder hydrometers g/ml** ①

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 0.650 - 1.000<br>1.000 - ..... |
| Division | 0.005 or 0.010 g/ml | ⇩ |
| Accuracy | 0.005 or 0.010 g/ml | .....- 2.000<br>1.500 - 2.000 |
| Length | 235 or 300 mm | |

**D 046** **Hydrometers > 2000 g/ml**

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 2.000 - 2.500<br>2.500 - ..... |
| Division | 0.002-0.005-0.010 g/ml | ⇩ |
| Accuracy | 0.004-0.010-0.020 g/ml | ..... - 3.500<br>3.500 - 4.000 |
| Length | 300 mm | |

**D 047** **300 g/ml Series**

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 1.000 - 1.300<br>1.300 - 1.600<br>1.600 - 1.900 |
| Division | 0.005 g/ml | |
| Accuracy | 0.010 g/ml | |
| Length | 300 mm | |

**D 048** **200 g/ml Series** ②

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 0.600 - 0.800<br>0.800 - 1.000<br>1.000 - ..... |
| Division | 0.002 g/ml | ⇩ |
| Accuracy | 0.004 g/ml | ..... - 1.800<br>1.800 - 2.000 |
| Length | 300 mm | |

**D 049** **100 g/ml Series**

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... |
| Division | 0.001 g/ml | ⇩ |
| Accuracy | 0.002 g/ml | ..... - 1.900<br>1.900 - 2.000 |
| Length | 300 mm | |

**D 050** **100 g/ml Series - Scale shifted**

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 0.650 - 0.750<br>0.750 - 0.850<br>0.850 - ..... |
| Division | 0.001 g/ml | ⇩ |
| Accuracy | 0.002 g/ml | ..... - 1.950<br>1.950 - 2.050 |
| Length | 300 mm | |


**Other temperatures of calibration upon request**

**D 051** **60 g/ml Series** ③

| | | Range g/ml |
|---|---|---|
| Temp. | 15°C | 0.600 - 0.660<br>0.650 - 0.710<br>0.700 - ..... |
| Division | 0.001 g/ml | ⇩ |
| Accuracy | 0.002 g/ml | ..... - 1.960<br>1.950 - 2.010 |
| Length | 280 mm | |

**D 052** **60 g/ml Series - Small size**

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 0.700 - 0.760<br>0.760 - 0.820<br>0.820 - ..... |
| Division | 0.001 g/ml | ⇩ |
| Accuracy | 0.002 g/ml | ..... - 1.900<br>1.900 - 1.960 |
| Length | 160 mm | |

**These hydrometers are not delivered with Calibration Certificates**

## COMMERCIAL GRADE

**Density hydrometers (g/ml)**

With benchmark.

Reading below meniscus.

**D 053** — **70 g/ml Series** ①

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 0.635 - 0.705<br>0.695 - 0.765<br>0.755 - ..... |
| Division | 0.001 g/ml | ↓ |
| Accuracy | 0.001 g/ml | ..... - 1.905<br>1.895 - 1.965 |
| Length | 185 mm | |

## WITH THERMOMETERS

**Density hydrometers (g/ml)**

Red liquid Thermometer 0+40°C : 1°C

Reading below meniscus.

**D 054** — **100 g/ml Series with thermometer** ②

| | | Range g/ml |
|---|---|---|
| Temp. | 20°C | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... |
| Division | 0.001 g/ml | ↓ |
| Accuracy | 0.001 g/ml | ..... - 1.900<br>1.900 - 2.000 |
| Length | 310 mm | |

**D 055** — **60 g/ml Series with thermometer** ③

| | | Range g/ml |
|---|---|---|
| Temp. | 15°C | 0.600 - 0.660<br>0.650 - 0.710<br>0.700 - ..... |
| Division | 0.001 g/ml | ↓ |
| Accuracy | 0.001 g/ml | ..... - 1.960<br>1.950 - 2.010 |
| Length | 280 mm | |



Other temperatures of calibration upon request (see page 43)

## COMMERCIAL GRADE

**Specific gravity hydrometers (Sp.Gr)**

Reading below meniscus.

**D 056** — **Range finder hydrometers Sp.Gr.** ④

| | | Range Sp.Gr |
|---|---|---|
| Temp. | 60/60°F | 0.650 - 1.000<br>1.000 - ..... |
| Division | 0.005 or 0.010 Sp.Gr | ↓ |
| Accuracy | 0.005 or 0.010 Sp.Gr | ..... - 2.000<br>1.500 - 2.000 |
| Length | 235 at 310 mm | |

**D 057** — **200 Sp.Gr. Series** ⑤

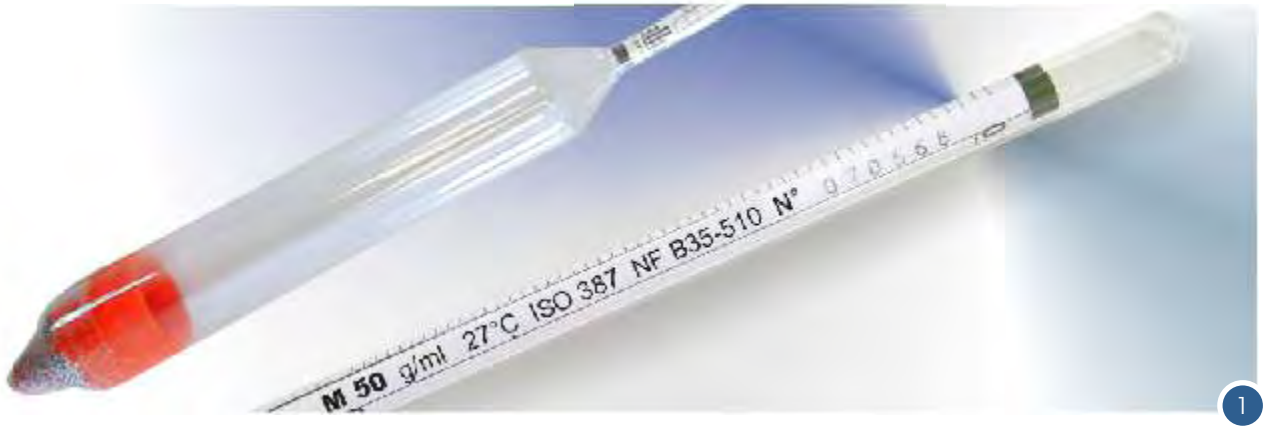
| | | Range Sp.Gr |
|---|---|---|
| Temp. | 60/60°F | 0.600 - 0.800<br>0.800 - 1.000<br>1.000 - ..... |
| Division | 0.002 Sp.Gr | ↓ |
| Accuracy | 0.004 Sp.Gr | ..... - 1.800<br>1.800 - 2.000 |
| Length | 300 mm | |

**D 058** — **100 Sp.Gr. Series** ⑥

| | | Range Sp.Gr |
|---|---|---|
| Temp. | 60/60°F | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... |
| Division | 0.001 Sp.Gr | ↓ |
| Accuracy | 0.002 Sp.Gr | ..... - 1.900<br>1.900 - 2.000 |
| Length | 300 mm | |

**These hydrometers are not delivered with Calibration Certificates**

# HYDROMETERS FOR TROPICAL COUNTRIES




1

The reference temperature for density hydrometers is 20°C. In special circumstances and in tropical countries, it is necessary to operate at an ambiente temperature above 20°C. In the standard ISO 387 we accept the use of 27°C for standardized instruments and up to 27.5°C for non standardized instruments.

## ISO 387 - NF B 35-510
**Density hydrometers (g/ml)**
**GENERAL PURPOSE**

They are calibrated according to the following surface tensions:
from 0.600 to 1.000 g/ml= 16 at 35 mN/m (low tension)
from 1.000 to 1.300 g/ml= 55 mN/m (medium tension)
from 1.300 to 2.000 g/ml= 75 mN/m (high tension)
Reading below meniscus.

### D 059 — 100 g/ml Series

| | | Range g/ml |
|---|---|---|
| Temp. | 27 °C | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... ▼<br>..... - 1.900<br>1.900 - 2.000 |
| Division | 0.002 g/ml | |
| Accuracy | 0.002 g/ml | |
| Length | 250 mm | |

### D 060 — 50 g/ml Series ①

| | | Range g/ml |
|---|---|---|
| Temp. | 27 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... ▼<br>..... - 1.950<br>1.950 - 2.000 |
| Division | 0.001 g/ml | |
| Accuracy | 0.001 g/ml | |
| Length | 270 mm | |

### D 061 — 50 g/ml Series

| | | Range g/ml |
|---|---|---|
| Temp. | 27 °C | 0.600 - 0.650<br>0.650 - 0.700<br>0.700 - ..... ▼<br>..... - 1.950<br>1.950 - 2.000 |
| Division | 0.0005 g/ml | |
| Accuracy | 0.0005 g/ml | |
| Length | 335 mm | |

## COMMERCIAL GRADE
**Density hydrometers (g/ml)**
Reading below meniscus.

### D 062 — Range finder hydrometers

| | | Range g/ml |
|---|---|---|
| Temp. | 27.5°C | 0.650 - 1.000<br>1.000 - 1.500 |
| Division | 0.005 g/ml | |
| Accuracy | 0.010 g/ml | |
| Length | 235 - 300 mm | |

### D 063 — 200 g/ml Series

| | | Range g/ml |
|---|---|---|
| Temp. | 27.5°C | 0.600 - 0.800<br>0.800 - 1.000<br>1.000 - ..... ▼<br>..... - 1.800<br>1.800 - 2.000 |
| Division | 0.002 g/ml | |
| Accuracy | 0.004 g/ml | |
| Length | 300 mm | |

### D 064 — 100 g/ml Series

| | | Range g/ml |
|---|---|---|
| Temp. | 27.5°C | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... ▼<br>..... - 1.900<br>1.900 - 2.000 |
| Division | 0.001 g/ml | |
| Accuracy | 0.002 g/ml | |
| Length | 300 mm | |

### D 065 — 100 g/ml Series with red liquid thermometer 0+40°C : 1°C

| | | Range g/ml |
|---|---|---|
| Temp. | 27.5°C | 0.600 - 0.700<br>0.700 - 0.800<br>0.800 - ..... ▼<br>..... - 1.500<br>1.500 - 1.600 |
| Division | 0.001 g/ml | |
| Accuracy | 0.002 g/ml | |
| Length | 310 mm | |

**Other scales available upon request**

# °BAUME

## HYDROMETERS


1

This unit of measure, obselete in most countries is still asked for by certain industries or users.
They can be asked for in order to perform general purpose or specific usages.

**D 066** **Range finder hydrometers °Bé** ① ②

| Temp. | 15°C | Range °Bé |
|---|---|---|
| Division | 0.5 or 1 °Bé | 0 - 70<br>0 - ....<br>⋮<br>40 - 70 |
| Accuracy | 1 or 2 °Bé | |
| Length | 240 at 320 mm | |

**D 067** **15 °Bé Series**

| Temp. | 15°C | Range °Bé |
|---|---|---|
| Division | 0.1 or 0.5 °Bé | 0 - 15<br>15 - .....<br>⋮<br>... - 60<br>60 - 75 |
| Accuracy | 0.2 or 1 °Bé | |
| Length | 280 mm | |

**D 068** **10 °Bé Series** ③

| Temp. | 15°C | Range °Bé |
|---|---|---|
| Division | 0.1 °Bé | 0 - 10<br>10 - ...<br>⋮<br>... - 60<br>60 - 70 |
| Accuracy | 0.2 °Bé | |
| Length | 280 mm | |

**D 069** **10 °Bé Series - Scale shifted**

| Temp. | 15°C | Range °Bé |
|---|---|---|
| Division | 0.1 °Bé | 5 - 15<br>15 - .....<br>⋮<br>... - 65<br>65 - 70 |
| Accuracy | 0.2 °Bé | |
| Length | 280 mm | |


2

**Other temperature of calibration upon request**


3

**These hydrometers are not delivered with Calibration Certificates**

**Other scales available in our specific catalogues**

# ° BRIX & ° TWADDLE

## HYDROMETERS


1 2

### ° BRIX SACCHAROMETERS

Reading below meniscus.
Available, upon request with an ALLA FRANCE Traceable Calibration Certificate EU

**D 070** — **Range finder hydrometers** ①

| | | Range °Bx |
|---|---|---|
| Temp. | 20°C | 0 - 35<br>0 - 30 (*)<br>30 - 60<br>60 - 90 |
| Division | 0.5 °Bx | |
| Accuracy | 0.5 or 1 °Bx | |
| Length | 300 mm | |

(*) exist in 0.2 °Bx

**D 071** — **15 °Brix Series**

| | | Range °Bx |
|---|---|---|
| Temp. | 20°C | 0 - 15<br>15 - ....<br>↓<br>.... - 75<br>75 - 90 |
| Division | 0.1 °Bx | |
| Accuracy | 0.1 °Bx | |
| Length | 300 mm | |

**D 072** — **10 °Brix Series**

| | | Range °Bx |
|---|---|---|
| Temp. | 20°C | -5 + 5<br>0 - 10<br>10 - ...<br>↓<br>.... - 80<br>80 - 90 |
| Division | 0.1°Bx | |
| Accuracy | 0.1 °Bx | |
| Length | 300 mm | |

**Saccharometers in °PLATO upon request**

### SUGAR HYDROMETERS

Reading below meniscus.

**D 073**

| | | Range kg/m³ |
|---|---|---|
| Temp. | 20°C | -0.5 - 3<br>0 - 3<br>3 - ...<br>↓<br>... - 15<br>15 - 18 |
| Division | 1 kg/m³ | |
| Accuracy | 1 kg/m³ | |
| Length | 270 or 320 mm | |

### ° BRIX SACCHAROMETERS

**With thermometer** 0+40°C : 1°C
Reading below meniscus.
Available, upon request with an ALLA FRANCE Traceable Calibration Certificate EU

**D 074** — **Red liquid thermometer** ②

| | | Range °Bx |
|---|---|---|
| Temp. | 20°C | 0 - 10<br>-5 + 5<br>10 - 20<br>20 - 30<br>0 - 35 (*) |
| Division | 0.1 °Bx | |
| Accuracy | 0.1 °Bx | |
| Length | 320 mm | |

(*) in 0.5 °Bx

**D 075** — **HG thermometer**

| | | Range °Bx |
|---|---|---|
| Temp. | 20°C | -5 + 5<br>0 - 10<br>10 - ....<br>↓<br>... - 90<br>0 - 30 (*) |
| Division | 0.1 °Bx | |
| Accuracy | 0.1 °Bx | |
| Length | 360 mm | |

(*) in 0.2 °Bx

3

### ° TWADDLE HYDROMETERS

Reading below meniscus.

**D 076** ③

| | | Range °Tw |
|---|---|---|
| Temp. | 15.6°C / 60°F | 0 - 24<br>24 - ....<br>↓<br>..... - 138<br>138 - 170 |
| Division | 0.5 and 1 °Tw | |
| Accuracy | 1 °Tw | |
| Length | 170 or 280 mm | |

# ALCOHOLOMETERS


1

## ALCOHOLOMETERS WITH OFFICIAL CONTROL

**According to OIML ISO 4801- NF B 35-515**
**Standard 76/765/CEE - Class II**
Ethanol by % Vol.
Official mark engraved on the body.
**With an Official Verification**
**L.N.E. Certificate**
(accredited laboratory COFRAC)

EU
Traceable Calibration Certificate
upon request

**D 077** ①

| | | Range %Vol |
|---|---|---|
| Temp. | 20°C | |
| Division | 0.1 %Vol | 0 - 10<br>6 - 16 |
| Accuracy | 0.1 %Vol | ↓ |
| Length | 350 mm | 90 - 100<br>95 - 103 |

## HIGH PRECISION ALCOHOLOMETERS

**ISO 4801 - NF B 35-515**
Ethanol en % Vol.
Delivered with a Certificate of Conformity

EU
Traceable Calibration Certificate
upon request

**D 080** **0.1% Vol Series - OIML type**

| | | Range %Vol |
|---|---|---|
| Temp. | 20°C | |
| Division | 0.1 %Vol | 0 - 10<br>5 - 15 |
| Accuracy | 0.1 %Vol | ↓ |
| Length | 350 mm | 90 - 100<br>95 - 103 |

**D 081** **0.2% Vol Series**

| | | Range %Vol |
|---|---|---|
| Temp. | 20°C | |
| Division | 0.2 %Vol | 0 - 20<br>20 - 40 |
| Accuracy | 0.2 %Vol | ↓ |
| Length | 350 mm | 60 - 80<br>80 - 100 |

## PRECISION ALCOHOLOMETERS

Delivered with a Certificate of Conformity

**D 078** **Range finder** ②

| | | Range |
|---|---|---|
| Temp. | 20°C | |
| Division | 1 %Vol / GL / Tralles<br>0.5 Cartier | |
| Accuracy | 1 %Vol / GL / Tralles<br>0.5 Cartier | 0-100 %Vol / GL / Tralles<br>10 - 44 Cartier |
| Length | 360 mm | |

| | | Range %Vol |
|---|---|---|
| Temp. | 20°C | |
| Division | 0.5 %Vol | |
| Accuracy | 0.5 %Vol | 0 - 35<br>35 - 70<br>70 - 100 |
| Length | 320 mm | |

3

2

## PRECISION THERMO-ALCOHOLOMETERS

Delivered with a Certificate of Conformity

**D 079** **Red liquid thermometer** 0+40°C :1°C ③

| | | Range |
|---|---|---|
| Temp. | 20°C | |
| Division | 1 %Vol / GL / Tralles<br>0.5 Cartier | |
| Accuracy | 1 %Vol / GL / Tralles<br>0.5 Cartier | 0-100 %Vol / GL / Tralles<br>10 - 44 Cartier |
| Length | 370 mm | |

| | | Range %Vol |
|---|---|---|
| Temp. | 20°C | |
| Division | 0.5 %Vol | |
| Accuracy | 0.5 %Vol | 0 - 35<br>35 - 70<br>70 - 100 |
| Length | 335 mm | |

**Other series are availa**
**in our specific catalogu**
**for Distilleries**
**& Wine industry**

# COMMERCIAL GRADE
# MILK HYDROMETERS


## MILK HYDROMETERS

Surface tension: 45 mN/m
Reading upper meniscus.

**D 082**

| | | |
|---|---|---|
| Temp. | 20°C | Range g/ml |
| Division | 0.001 g/ml | 1.000 - 1.040<br>1.015 - 1.040 (*) |
| Accuracy | 0.002 g/ml | |
| Length | 165 or 225 mm | |

(*) Quevenne Hydrometer

| | | |
|---|---|---|
| Temp. | 20°C | Range % milk fat |
| Division | 1 % milk fat | 0 - 4 |
| Accuracy | 1 % milk fat | |
| Length | 200 mm | |


## QUEVENNE HYDROMETER

**Thermometer in the stem** 0+40°C :1°C LR or HG
Surface tension: 45 mN/m
Reading upper meniscus.

**D 083** ①

| | | |
|---|---|---|
| Temp. | 20°C | Range g/ml |
| Division | 0.0005 g/ml and 0.001 g/ml | 1.015 - 1.040 |
| Accuracy | 0.001 g/ml | |
| Length | 300 mm | |

## GERBER HYDROMETER NEGATIVE SCALE

**Thermometer in the stem** 0+40°C :1°C LR or HG
Surface tension: 45 mN/m
Reading upper meniscus.

**D 084** ②

| | | |
|---|---|---|
| Temp. | 20°C | Range g/ml |
| Division | 0.0005 g/ml | 1.020 - 1.040 |
| Accuracy | 0.001 g/ml | |
| Length | 300 mm | |

## DORNIC HYDROMETER

**Red liquid thermometer in body** 0+40°C : 1°C
Surface tension: 45 mN/m
Reading upper meniscus.

**D 085** ③

| | | |
|---|---|---|
| Temp. | 20°C | Range g/ml |
| Division | 0.001 g/ml | 1.018 - 1.038 |
| Accuracy | 0.002 g/ml | |
| Length | 220 mm | |

# SPECIFIC USE

## HYDROMETERS

There are various hydrometers for specific uses. We only specify a few examples in this list.
For any other specific use, please contact us.

D 086

| Use | |
|---|---|
| 3 | **Acetic Acid & Vinegar** |
| 2 | **Acid - General Use** |
| 7 | **Alkalis** |
| 9 | **Ammonia** |
| 10 | **Antifreeze Ethylene glycol** |
| 11 | **Antifreeze Propylene glycol** |
| 1 | **Bee Food** |
| 13 | **Bleach** |
| 12 | **Boiler Water** |
| 27 | **Caustic Potash** |
| 5 | **Citric & Tartaric Acids** |
| 16 | **Ether** |
| 17 | **Gelatinometer** |
| 18 | **Glycerine** |
| 23 | **Heating Oil Fuel** |
| 4 | **Hydrochloric Acid** |
| 20 | **Hyposulfite Photo** |
| 8 | **Isopropyl alcohol** (for printing) |
| 22 | **Latexmeter** |
| 24 | **Mead hydrometer** |
| 6 | **Nitric & Sulfuric Acids** |
| 19 | **Oil** |
| 25 | **Olive oil hydrometer** |
| 15 | **Oxygenated Water** |
| 26 | **Phosphate** |
| 29 | **Salt** |
| 14 | **Sea water** |
| 28 | **Soap** |
| 32 | **Sulfurdioxide in water** |
| 31 | **Sulphate** |
| 30 | **Syrup hydrometer** |
| 33 | **Urine** |
| 21 | **Whitewash** |

# Accessories

Accessories

# ACCESSORIES

## GRADUATED MEASURING CYLINDERS

Excellent resistance to chemical agents.
Sterilized at 120°C.

**A 001** — **In glass** — ①

| | | |
|---|---|---|
| Standard | ISO 4788 | ml |
| Glass | Borosilicate | 100<br>250<br>500<br>1000 |
| Graduation | Amber | |
| Base | Hexagonal | |

**A 002** — **In plastic**

| | | |
|---|---|---|
| Plastic | Polypropylene | ml |
| Model | High | 100<br>250<br>500<br>1000 |
| Base | Hexagonal | |


## UNGRADUATED MEASURING CYLINDERS

**A 003** — ②

| | | |
|---|---|---|
| Plastic | PVC | ml |
| Model | High | 250 |
| Base | Black & Triangular | |

③

| | | |
|---|---|---|
| Plastic | PVC | ml |
| Model | High | 250<br>500 |
| Base | Hexagonal screw base | |


## RUBBER PIPETTES

**High resistance to chemical agents.**

With three valves in natural rubber.
With glass beads.

**A 004**

| Models | ml | Ø mm |
|---|---|---|
| Red Standard | 50 | 5 - 8 |
| Green Universal | 50 | 3 - 11 |

## PIP-LAB

**To avoid any risk of manipulation of corrosive or toxic liquids.**

Accepts all types of pipettes thanks to its flexible connecting joint.
Permits precise filling by turning the toothed wheel up or down.
Enables easy decanting by pressing the button on the side.

Dismantles in seconds: all composant parts can be cleaned.
Silicon joint.

**A 005**

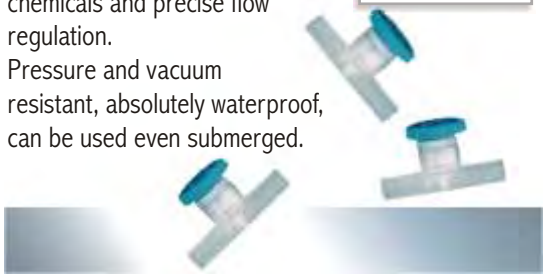
| Models | ml |
|---|---|
| Blue | 2 |
| Green | 10 |
| Red | 25 |

## BURETTE TAPS

Unbreakable polypropylene tap for diverse laboratory usage.
Easy fitting to tubes.
No lubricant required.
Excellent resistance to most chemicals and precise flow regulation.
Pressure and vacuum resistant, absolutely waterproof, can be used even submerged.

**A 006**

| Ø mm |
|---|
| 6 |
| 7 |



For an environmentally
# RESPONSIBLE ATTITUDE


## MERCURY DECONTAMINATION KIT WITH GUARANTEE FROM THE TREATMENT CENTRE A 007

**Make easy the collection of mercury**

From the time that the chemical powder has absorbed the mercury, the vapours are neutralised.

In the case of a broken mercury thermometer,
**De-pollutes up to 99%**

**When the used kit is returned to us, we look after the re-processing at no extra charge.**
The package enables it to be transported back to us without problem. For companies under ISO 14001, we provide a document proving correct reprocessing & recycling by the treatment centre.

**The kit ① is composed of:**
- a sealed plastic sachet, containing zinc powder (15 grams)
- 2 open sealable boxes
- a foam protected hermetically sealing envelope in which to return the contaminated mixture
- an instructions for use notice

It is automatically supplied with :
- normalised mercury filled thermometers
- Electronic ebulliometer (see specialised catalogue)

The blister packed mercury thermometers in packs of 15 pcs (pg. 17), are supplied with the zinc powder and 2 sealable boxes.


### How to use ?

www.allafrance.com/kit-mercure.html

**We strongly suggest that you put on gloves, mask and goggles before starting to clean up spilled mercury.**

Find and isolate the droplets of mercury. Open the sachet, and sprinkle the powder onto the mercury droplets. Wait a few minutes to enable the powder to absorb the mercury.

While the powder is reacting with the mercury, take the broken thermometer tube, hold it over the empty box and tap the glass gently until all remaining mercury comes out, before carefully disposing of the broken glass in an adapted bin. Using a damp absorbent paper, collect the mixture, and put it in the empty box. If you do not have absorbent paper, a plastic or stainless steel utensil can be used. Alternatively, a pipette can be used, and the tip placed with the contaminated mixture to be returned.

Close the box containing the contaminated mixture. It is now sealed. Put the box and the absorbent paper or pipette tip into the sachet, and seal. Place the sachet in the envelope, and send it back to the supplier, who will look after its collection.
Do not return the broken glass of the thermometer.

To completely de-pollute the surface affected by the spill, mix a solution of sulphur and calcium carbonate, and scrub thoroughly, before wiping clean with water.

## GROUND JOINT ADAPTATION KIT A 008

This kit enables adaptation of all solid stem thermometers (diameter 6/7 mm) for use with glass testing apparatus requiring temperature measurment during testing.
The kit is to be placed on a cone-shaped female ground joint 14/23.

**The kit ② is composed of:**
- a cone-shaped male ground joint 14/23 glass welded to a threaded tapered tube
- a sealing silicon joint with PTFE coating
- a sliding cap enabling the user to insert the thermometer to the distance required compatible with solid stem thermometer of diameter 6/7mm.


## PROTECTION SLEEVES FOR THERMOMETERS A 009

For the protection of our laboratory stem thermometers ø 6/7 mm without ring (see pg 17), we propose 2 types of sleeves: wood sleeve ③ or metal sleeve ④.

# INDEX

# INDEX

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