

## Spirits



# Reagents and Standards for The Analysis of Spirit Drinks



As per Official Methods of Analysis of AOAC International, 19th Edition, 2012 Volume 2. Dr George W. Latimer, Jr.

## AOAC Official Method 950.05 Esters and Aldehydes in Distilled Liquors

Chapter	Product No.	Description	Pack Size
26.1.24A.a	T20051	Analytical Volumetric Solution Sodium Thiosulphate 0.05N, 0.05M	1L
26.1.24A.b	I2005F	Analytical Volumetric Solution Iodine 0.1N, 0.05M	1L

## AOAC Official Method 972.07 Esters in Distilled Liquors

Chapter	Product No.	Description	Pack Size
26.1.25B.a	H24001	Analytical Volumetric Solution Hydrochloric Acid 4N, 4M	1L
26.1.25B.b	H24002	Analytical Volumetric Solution Hydrochloric Acid 4N, 4M	1L

## AOAC Official Method 958.04 Methanol in Distilled Liquors

Chapter	Product No.	Description	Pack Size
26.1.34A.a	1070902	European Pharmacopoeia Reagent Potassium Permanganate Solution	1L

Commission Regulation (EC) No 2870/2000 of 19 December 2000 laying down Community reference methods for the analysis of spirits drinks

## Method A: Determination of Real Alcoholic Strength by Volume of Spirit Drinks - Measurement by Pycnometry

Chapter	Product No.	Description	Pack Size
A.2.1	NACL2WV5	Sodium Chloride 2%	500ml

## Method C: Determination of Real Alcoholic Strength by Volume of Spirit Drinks - Measurement by Densimetry using Hydrostatic Balance

Chapter	Product No.	Description	Pack Size
C.2.1	S30WW1	Sodium Hydroxide 30% w/w (40% w/v)	1L

## AOAC Official Method 963.09 Sodium in Distilled Liquors. Flame Photometric Method. Industrial Flame Photometry Standards

Product No.	Description	Concentration	Pack size
FIBA1	Barium	1,000ppm	500ml
FIBA3	Barium	3,000ppm	500ml
FICA1	Calcium	1,000ppm	500ml
FICA2	Calcium	2,000ppm	500ml
FICS1	Cesium	1,000ppm	500ml
FILI1	Lithium	1,000ppm	500ml
FINA1	Sodium	1,000ppm	500ml
FIK1	Potassium	1,000ppm	500ml
FISR1	Strontium	1,000ppm	500ml
FIRB1	Rubidium	1,000ppm	500ml

### Multi-Element Linearity Standards

Product Number	Description	Concentration	Pack Size
FPLE5		Low	500ml
	Barium	28.8ppm	
	Calcium	18.2ppm	
	Lithium	1.91ppm	
	Potassium	2.09ppm	
	Sodium	2.15ppm	
FPME5		Medium	500ml
	Barium	105ppm	
	Calcium	52.4ppm	
	Lithium	5.42ppm	
	Potassium	5.37ppm	
	Sodium	5.67ppm	
FPHE5		High	500ml
	Barium	510ppm	
	Calcium	112ppm	
	Lithium	10.0ppm	
	Potassium	11.4ppm	
	Sodium	11.3ppm	
FPHK3	Combination of FPLE5, FPME5 & FPHE5	As above	3 x 500ml

## AOAC Official Method 970.12 Iron in Distilled Liquors. Atomic Absorption Spectrophotometric Method.

Description	Concentration 1,000ppm	Concentration 10,000ppm
Aluminium in 0.5M Nitric Acid	AAALH	
Aluminium in 1M Nitric Acid		AAALM
Antimony in Water	AASBH	AASBM
Arsenic (III) in 1M Hydrochloric Acid	AAASH	AAASM
Arsenic (V) in 1M Nitric Acid	AAAS05H	
Barium in 0.5M Nitric Acid	AABAH	
Barium in 1M Nitric Acid		AABAM
Beryllium in 1M Hydrochloric Acid	AABEH	AABEM
Bismuth in 0.5M Nitric Acid	AABIH	
Bismuth in 1M Nitric Acid		AABIM
Boron in Water	AAB-H	AAB-M
Cadmium in 0.5M Nitric Acid	AACDH	
Cadmium in 1M Nitric Acid		AACDM
Calcium in 0.5M Nitric Acid	AACAH	
Calcium in 1M Nitric Acid		AACAM
Cesium in 1M Nitric Acid	AACSH	AACSM
Chromium in 0.5M Nitric Acid	AACRH	
Chromium in 1M Nitric Acid		AACRM
Cobalt in 0.5M Nitric Acid	AACOH	
Cobalt in 1M Nitric Acid		AACOM
Copper in 0.5M Nitric Acid	AACUH	
Copper in 1M Nitric Acid		AACUM
Gadolinium in 1M Hydrochloric Acid	AAGDH	AAGDM
Gallium in 1M Hydrochloric Acid	AAGAH	AAGAM
Gold in 2M Hydrochloric Acid	AAAUH	AAAUM
Indium in 1M Nitric Acid	AAINH	AAINM
Iridium in 10% Hydrochloric Acid	AAIRH	AAIRM
Iron in 0.5M Nitric Acid	AAFEH	
Iron in 1M Nitric Acid		AAFEM
Lanthanum in 1M Nitric Acid	AALAH	AALAM
Lead in 0.5M Nitric Acid	AAPBH	
Lead in 1M Nitric Acid		AAPBM
Lithium in 0.5M Nitric Acid	AALIH	
Lithium in 1M Nitric Acid		AALIM
Magnesium in 0.5M Nitric Acid	AAMGH	
Magnesium in 1M Nitric Acid		AAMGM
Manganese in 1M HCl	AAMNH	AAMNM
Mercury in 0.5M Nitric Acid	AAHGH	
Mercury in 1M Nitric Acid		AAHGM
Molybdenum in Water	AAMOH	AAMOM
Nickel in 0.5M Nitric Acid	AANIH	

Description	Concentration 1,000ppm	Concentration 10,000ppm
Nickel in 1M Nitric Acid		AANIM
Palladium in 1M Hydrochloric Acid	AAPDH	AAPDM
Phosphorus in Water	AAP-H	AAP-M
Platinum in 1M Hydrochloric Acid	AAPTH	AAPTM
Potassium in 0.5M Nitric Acid	AAK-H	
Potassium in 1M Nitric Acid		AAK-M
Rhodium in 1M Nitric Acid	AARHH	AARHM
Selenium in 0.5M Nitric Acid	AASEH	
Selenium in 1M Nitric Acid		AASEM
Silicon in Water	AASIH	AASIM
Silver in 0.5M Nitric Acid	AAAGH	
Silver in 1M Nitric Acid		AAAGM
Sodium in 0.5M Nitric Acid	AANA H	
Sodium in 1M Nitric Acid		AANAM
Strontium in 0.5M Nitric Acid	AASRH	
Strontium in 1M Nitric Acid		AASRM
Sulphur in Water	AAS-H	AAS-M

## AOAC Official Method 950.04 Alcohol by Volume in Distilled Liquors. ISO Guide 34 Sucrose in Water standards- 12 Week Shelf Life

Product No.	% Sucrose in water (w/w) @ 20°C	Nominal Brix % *	Nominal Refractive Index @ 20°C*	Pack size
BS00	0% Sucrose	0% Brix	1.332986	15ml
BS05	5% Sucrose	5% Brix	1.340264	15ml
BS07	7% Sucrose	7% Brix	1.343253	15ml
BS10	10% Sucrose	10% Brix	1.347824	15ml
BS112	11.2% Sucrose	11.2% Brix	1.349682	15ml
BS115	11.5% Sucrose	11.5% Brix	1.350149	15ml
BS12	12% Sucrose	12% Brix	1.350930	15ml
BS125	12.5% Sucrose	12.5% Brix	1.351714	15ml
BS15	15% Sucrose	15% Brix	1.355679	15ml
BS20	20% Sucrose	20% Brix	1.363842	15ml
BS25	25% Sucrose	25% Brix	1.372328	15ml
BS30	30% Sucrose	30% Brix	1.381149	15ml
BS35	35% Sucrose	35% Brix	1.390322	15ml
BS40	40% Sucrose	40% Brix	1.399860	15ml
BS45	45% Sucrose	45% Brix	1.409777	15ml
BS50	50% Sucrose	50% Brix	1.420087	15ml
BS55	55% Sucrose	55% Brix	1.430800	15ml
BS60	60% Sucrose	60% Brix	1.441928	15ml
<i>*The nominal Brix and Refractive Index values are taken from the ICUMSA published tables</i>				

**AOAC Official Method 945.06 Specific Gravity (Apparent) of Distilled Liquor. Pycnometer Method.**

**AOAC Official Method 942.06 Alcohol by volume in Distilled Liquors. Pycnometer Method.**

**AOAC Official Method 945.07 Alcohol by Weight in Distilled Liquors. Pycnometer Method.  
Density Standards at 15°C**

Product No.	Description	Pack size
DEN15010PY	Density Standard 0.6960g/ml @15°C	100ml
DEN15020PY	Density Standard 0.7073g/ml @15°C	100ml
DEN15030 PY	Density Standard 0.7184g/ml @15°C	100ml
DEN15040PY	Density Standard 0.7298g/ml @15°C	100ml
DEN15050PY	Density Standard 0.7411g/ml @15°C	100ml
DEN15060PY	Density Standard 0.7524g/ml @15°C	100ml
DEN15070PY	Density Standard 0.7721g/ml @15°C	100ml
DEN15080PY	Density Standard 0.7933g/ml @15°C	100ml
DEN15090PY	Density Standard 0.8168g/ml @15°C	100ml
DEN15100PY	Density Standard 0.8428g/ml @15°C	100ml
DEN15110PY	Density Standard 0.8715g/ml @15°C	100ml
DEN15120PY	Density Standard 0.9135g/ml @15°C	100ml
DEN15130PY	Density Standard 0.9514g/ml @15°C	100ml
DEN15140PY	Density Standard 1.0040g/ml @15°C	100ml
DEN15150PY	Density Standard 1.0337g/ml @15°C	100ml
DEN15160PY	Density Standard 1.0828g/ml @15°C	100ml
DEN15170PY	Density Standard 1.1661g/ml @15°C	100ml
DEN15180PY	Density Standard 1.2498g/ml @15°C	100ml
DEN15190PY	Density Standard 1.3318g/ml @15°C	100ml
DEN15200PY	Density Standard 1.4152g/ml @15°C	100ml
DEN15210PY	Density Standard 1.5820g/ml @15°C	100ml
DEN15220PY	Density Standard 1.7495g/ml @15°C	100ml
DEN15230PY	Density Standard 1.9171g/ml @15°C	100ml
DEN15240PY	Density Standard 2.0846g/ml @15°C	100ml
DEN15250PY	Density Standard 2.2568g/ml @15°C	100ml
DEN15260PY	Density Standard 2.4261g/ml @15°C	100ml
DEN15270PY	Density Standard 2.6055g/ml @15°C	100ml
DEN15280PY	Density Standard 2.7588g/ml @15°C	100ml
DEN15290PY	Density Standard 2.9418g/ml @15°C	100ml
DEN15300PY	Density Standard 3.1140g/ml @15°C	100ml

**AOAC Official Method 945.06 Specific Gravity (Apparent)of Distilled Liquor.Pyconometer Method.  
 AOAC Official Method 942.06 Alcohol by volume in Distilled Liquors. Pyconometer Method.  
 AOAC Official Method 945.07 Alcohol by Weight in Distilled Liquors. Pyconometer Method.  
 Density Standards at 20°C**

Product No.	Description	Pack size
DEN20010PY	Density Standard 0.6919g/ml @20°C	100ml
DEN20020PY	Density Standard 0.7033g/ml @20°C	100ml
DEN20030PY	Density Standard 0.7148g/ml @20°C	100ml
DEN20040PY	Density Standard 0.7261g/ml @20°C	100ml
DEN20050PY	Density Standard 0.7374g/ml @20°C	100ml
DEN20060PY	Density Standard 0.7488g/ml @20°C	100ml
DEN20070PY	Density Standard 0.7683g/ml @20°C	100ml
DEN20080PY	Density Standard 0.7893g/ml @20°C	100ml
DEN20090PY	Density Standard 0.8126g/ml @20°C	100ml
DEN20100PY	Density Standard 0.8384g/ml @20°C	100ml
DEN20110PY	Density Standard 0.8668g/ml @20°C	100ml
DEN20120PY	Density Standard 0.9098g/ml @20°C	100ml
DEN20130PY	Density Standard 0.9476g/ml @20°C	100ml
DEN20140PY	Density Standard 1.0005g/ml @20°C	100ml
DEN20150PY	Density Standard 1.0301g/ml @20°C	100ml
DEN20160PY	Density Standard 1.0792g/ml @20°C	100ml
DEN20170PY	Density Standard 1.1651g/ml @20°C	100ml
DEN20180PY	Density Standard 1.2486g/ml @20°C	100ml
DEN20190PY	Density Standard 1.3304g/ml @20°C	100ml
DEN20200PY	Density Standard 1.4136g/ml @20°C	100ml
DEN20210PY	Density Standard 1.5799g/ml @20°C	100ml
DEN20220PY	Density Standard 1.7470g/ml @20°C	100ml
DEN20230PY	Density Standard 1.9141g/ml @20°C	100ml
DEN20240PY	Density Standard 2.0812g/ml @20°C	100ml
DEN20250PY	Density Standard 2.2531g/ml @20°C	100ml
DEN20260PY	Density Standard 2.4219g/ml @20°C	100ml
DEN20270PY	Density Standard 2.6011g/ml @20°C	100ml
DEN20280PY	Density Standard 2.7542g/ml @20°C	100ml
DEN20290PY	Density Standard 2.9370g/ml @20°C	100ml
DEN20300PY	Density Standard 3.1096g/ml @20°C	100ml



**AOAC Official Method 945.06 Specific Gravity (Apparent)of Distilled Liquor.Pycnometer Method.  
 AOAC Official Method 942.06 Alcohol by volume in Distilled Liquors. Pycnometer Method.  
 AOAC Official Method 945.07 Alcohol by Weight in Distilled Liquors. Pycnometer Method.  
 Density Standards at 25°C**

Product No.	Description	Pack size
DEN25010PY	Density Standard 0.6878g/ml @25°C	100ml
DEN25020PY	Density Standard 0.6993g/ml @25°C	100ml
DEN25030PY	Density Standard 0.7111g/ml @25°C	100ml
DEN25040PY	Density Standard 0.7223g/ml @25°C	100ml
DEN25050PY	Density Standard 0.7337g/ml @25°C	100ml
DEN25060PY	Density Standard 0.7452g/ml @25°C	100ml
DEN25070PY	Density Standard 0.7645g/ml @25°C	100ml
DEN25080PY	Density Standard 0.7853g/ml @25°C	100ml
DEN25090PY	Density Standard 0.8084g/ml @25°C	100ml
DEN25100PY	Density Standard 0.8340g/ml @25°C	100ml
DEN25110PY	Density Standard 0.8622g/ml @25°C	100ml
DEN25120PY	Density Standard 0.9060g/ml @25°C	100ml
DEN25130PY	Density Standard 0.9438g/ml @25°C	100ml
DEN25140PY	Density Standard 0.9969g/ml @25°C	100ml
DEN25150PY	Density Standard 1.0265g/ml @25°C	100ml
DEN25160PY	Density Standard 1.0755g/ml @25°C	100ml
DEN25170PY	Density Standard 1.1639g/ml @25°C	100ml
DEN25180PY	Density Standard 1.2471g/ml @25°C	100ml
DEN25190PY	Density Standard 1.3287g/ml @25°C	100ml
DEN25200PY	Density Standard 1.4117g/ml @25°C	100ml
DEN25210PY	Density Standard 1.5775g/ml @25°C	100ml
DEN25220PY	Density Standard 1.7441g/ml @25°C	100ml
DEN25230PY	Density Standard 1.9108g/ml @25°C	100ml
DEN25240PY	Density Standard 2.0775g/ml @25°C	100ml
DEN25250PY	Density Standard 2.2490g/ml @25°C	100ml
DEN25260PY	Density Standard 2.4175g/ml @25°C	100ml
DEN25270PY	Density Standard 2.5964g/ml @25°C	100ml
DEN25280PY	Density Standard 2.7493g/ml @25°C	100ml
DEN25290PY	Density Standard 2.9319g/ml @25°C	100ml
DEN25300PY	Density Standard 3.1043g/ml @25°C	100ml

**AOAC Official Method 945.06 Specific Gravity (Apparent)of Distilled Liquor.Pyconometer Method.  
 AOAC Official Method 942.06 Alcohol by volume in Distilled Liquors. Pyconometer Method.  
 AOAC Official Method 945.07 Alcohol by Weight in Distilled Liquors. Pyconometer  
 Method.Density Standards at 40°C**

Product No.	Description	Pack size
DEN40010PY	Density Standard 0.6752g/ml @40°C	100ml
DEN40020PY	Density Standard 0.6872g/ml @40°C	100ml
DEN40030PY	Density Standard 0.6997g/ml @40°C	100ml
DEN40040PY	Density Standard 0.7109g/ml @40°C	100ml
DEN40050PY	Density Standard 0.7226g/ml @40°C	100ml
DEN40060PY	Density Standard 0.7343g/ml @40°C	100ml
DEN40070PY	Density Standard 0.7531g/ml @40°C	100ml
DEN40080PY	Density Standard 0.7733g/ml @40°C	100ml
DEN40090PY	Density Standard 0.7958g/ml @40°C	100ml
DEN40100PY	Density Standard 0.8207g/ml @40°C	100ml
DEN40110PY	Density Standard 0.8482g/ml @40°C	100ml
DEN40120PY	Density Standard 0.8945g/ml @40°C	100ml
DEN40130PY	Density Standard 0.9323g/ml @40°C	100ml
DEN40140PY	Density Standard 0.9857g/ml @40°C	100ml
DEN40150PY	Density Standard 1.0152g/ml @40°C	100ml
DEN40160PY	Density Standard 1.0642g/ml @40°C	100ml
DEN40170PY	Density Standard 1.1581g/ml @40°C	100ml
DEN40180PY	Density Standard 1.2408g/ml @40°C	100ml
DEN40190PY	Density Standard 1.3217g/ml @40°C	100ml
DEN40200PY	Density Standard 1.4039g/ml @40°C	100ml
DEN40210PY	Density Standard 1.5685g/ml @40°C	100ml
DEN40220PY	Density Standard 1.7339g/ml @40°C	100ml
DEN40230PY	Density Standard 1.8994g/ml @40°C	100ml
DEN40240PY	Density Standard 2.0649g/ml @40°C	100ml
DEN40250PY	Density Standard 2.2352g/ml @40°C	100ml
DEN40260PY	Density Standard 2.4028g/ml @40°C	100ml
DEN40270PY	Density Standard 2.5807g/ml @40°C	100ml
DEN40280PY	Density Standard 2.7329g/ml @40°C	100ml
DEN40290PY	Density Standard 2.9132g/ml @40°C	100ml
DEN40300PY	Density Standard 3.0852g/ml @40°C	100ml

**AOAC Official Method 945.06 Specific Gravity (Apparent)of Distilled Liquor.Pycnometer Method.  
 AOAC Official Method 942.06 Alcohol by volume in Distilled Liquors. Pycnometer Method.  
 AOAC Official Method 945.07 Alcohol by Weight in Distilled Liquors. Pycnometer  
 Method.Density Standards at 50°C**

Product No.	Description	Pack size
DEN50010PY	Density Standard 0.6668g/ml @50°C	100ml
DEN50020PY	Density Standard 0.6791g/ml @50°C	100ml
DEN50030PY	Density Standard 0.6917g/ml @50°C	100ml
DEN50040PY	Density Standard 0.7033g/ml @50°C	100ml
DEN50050PY	Density Standard 0.7151g/ml @50°C	100ml
DEN50060PY	Density Standard 0.7269g/ml @50°C	100ml
DEN50070PY	Density Standard 0.7454g/ml @50°C	100ml
DEN50080PY	Density Standard 0.7653g/ml @50°C	100ml
DEN50090PY	Density Standard 0.7873g/ml @50°C	100ml
DEN50100PY	Density Standard 0.8118g/ml @50°C	100ml
DEN50110PY	Density Standard 0.8387g/ml @50°C	100ml
DEN50120PY	Density Standard 0.8868g/ml @50°C	100ml
DEN50130PY	Density Standard 0.9245g/ml @50°C	100ml
DEN50140PY	Density Standard 0.9777g/ml @50°C	100ml
DEN50150PY	Density Standard 1.0073g/ml @50°C	100ml
DEN50160PY	Density Standard 1.0562g/ml @50°C	100ml
DEN50170PY	Density Standard 1.1512g/ml @50°C	100ml
DEN50180PY	Density Standard 1.2346g/ml @50°C	100ml
DEN50190PY	Density Standard 1.3138g/ml @50°C	100ml
DEN50200PY	Density Standard 1.3973g/ml @50°C	100ml
DEN50210PY	Density Standard 1.5609g/ml @50°C	100ml
DEN50220PY	Density Standard 1.7257g/ml @50°C	100ml
DEN50230PY	Density Standard 1.8904g/ml @50°C	100ml
DEN50240PY	Density Standard 2.0551g/ml @50°C	100ml
DEN50250PY	Density Standard 2.2247g/ml @50°C	100ml
DEN50260PY	Density Standard 2.3916g/ml @50°C	100ml
DEN50270PY	Density Standard 2.5689g/ml @50°C	100ml
DEN50280PY	Density Standard 2.7207g/ml @50°C	100ml
DEN50290PY	Density Standard 2.9005g/ml @50°C	100ml
DEN50300PY	Density Standard 3.0721g/ml @50°C	100ml

**AOAC Official Method 945.06 Specific Gravity (Apparent)of Distilled Liquor.Pyconometer Method.  
 AOAC Official Method 942.06 Alcohol by volume in Distilled Liquors. Pyconometer Method.  
 AOAC Official Method 945.07 Alcohol by Weight in Distilled Liquors. Pyconometer Method.  
 Density Standards at 60°C**

Product No.	Description	Pack size
DEN60010PY	Density Standard 0.6582g/ml @60°C	100ml
DEN60020PY	Density Standard 0.6708g/ml @60°C	100ml
DEN60030PY	Density Standard 0.6835g/ml @60°C	100ml
DEN60040PY	Density Standard 0.6955g/ml @60°C	100ml
DEN60050PY	Density Standard 0.7076g/ml @60°C	100ml
DEN60060PY	Density Standard 0.7196g/ml @60°C	100ml
DEN60070PY	Density Standard 0.7376g/ml @60°C	100ml
DEN60080PY	Density Standard 0.7572g/ml @60°C	100ml
DEN60090PY	Density Standard 0.7788g/ml @60°C	100ml
DEN60100PY	Density Standard 0.8027g/ml @60°C	100ml
DEN60110PY	Density Standard 0.8292g/ml @60°C	100ml
DEN60120PY	Density Standard 0.8790g/ml @60°C	100ml
DEN60130PY	Density Standard 0.9166g/ml @60°C	100ml
DEN60140PY	Density Standard 0.9695g/ml @60°C	100ml
DEN60150PY	Density Standard 0.9990g/ml @60°C	100ml
DEN60160PY	Density Standard 1.0478g/ml @60°C	100ml

**AOAC Official Method 945.06 Specific Gravity (Apparent)of Distilled Liquor.Pyconometer Method.  
 AOAC Official Method 942.06 Alcohol by volume in Distilled Liquors. Pyconometer Method.  
 AOAC Official Method 945.07 Alcohol by Weight in Distilled Liquors. Pyconometer Method.  
 Density Standards at 25°C**

Product No.	Description	Pack size
DEN80010PY	Density Standard 0.6407g/ml @80°C	100ml
DEN80020PY	Density Standard 0.6538g/ml @80°C	100ml
DEN80030PY	Density Standard 0.6661g/ml @80°C	100ml
DEN80040PY	Density Standard 0.6798g/ml @80°C	100ml
DEN80050PY	Density Standard 0.6923g/ml @80°C	100ml
DEN80060PY	Density Standard 0.7047g/ml @80°C	100ml
DEN80070PY	Density Standard 0.7220g/ml @80°C	100ml
DEN80080PY	Density Standard 0.7407g/ml @80°C	100ml
DEN80090PY	Density Standard 0.7614g/ml @80°C	100ml
DEN80100PY	Density Standard 0.7844g/ml @80°C	100ml
DEN80110PY	Density Standard 0.8098g/ml @80°C	100ml
DEN80120PY	Density Standard 0.8629g/ml @80°C	100ml
DEN80130PY	Density Standard 0.9006g/ml @80°C	100ml
DEN80140PY	Density Standard 0.9520g/ml @80°C	100ml
DEN80150PY	Density Standard 0.9815g/ml @80°C	100ml
DEN80160PY	Density Standard 1.0302g/ml @80°C	100ml