

Certificate of Analysis

1.01990.2500 1-Butanol for analysis EMSURE® ACS,ISO,Reag. Ph Eur Batch K54902590

| Appearance clear clear Color ≤ 10 Hazen < 5 Hazen Titrable acid ≤ 0.0008 meq/g 0.0001 meq/g Density (d 20 °C/20 °C) 0.8090 - 0.8120 0.8109 0.8109 Boiling point 116 - 1119 °C 117 °C 2-Butanol (GC) ≤ 0.05 % (v/v) < 0.01 % (v/v) Butyraldehyde (GC) ≤ 0.01 % (v/v) < 0.01 % (v/v) Butyraldehyde (GC) ≤ 0.1 % (v/v) < 0.01 % (v/v) Ibutyraldehyde (GC) ≤ 0.1 % (v/v) < 0.01 % (v/v) Ibutyraldehyde (GC) ≤ 0.1 % (v/v) < 0.01 % (v/v) Ibutyraldehyde (GC) ≤ 0.1 % (v/v) < 0.02 % (v/v) Ibutyraldehyde (GC) ≤ 0.1 % (v/v) < 0.02 % (v/v) Ibutyraldehyde (GC) ≤ 0.01 % (v/v) < 0.02 % (v/v) Ibutyraldehyde (GC) ≤ 0.01 < 0.01 % (v/v) < 0.00 | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------|---------|--------------|---------|
| Identity (IR) conforms conforms Appearance clear clear Color \$10 Hazen \$5 Hazen Itritable acid \$0,0008 med/g 0,0001 med/g Density (d 20 °C/20 °C) \$0,8090 - 0.8120* 0,0001 med/g Boiling point \$16 - 119 °C 117 °C 2-Butanol (GC) \$0.05 % (v/v) <0.01 % (v/v) Butlyraldehyde (GC) \$0.01 % (v/v) <0.01 % (v/v) Butyraldehyde (GC) \$0.15 % (v/v) <0.01 % (v/v) Isobutanol (GC) \$0.15 % (v/v) <0.01 % (v/v) Isobutanol (GC) \$0.01 % (v/v) <0 | | Spec. Values | | Batch Values | |
| Identity (IR) conforms conforms Appearance clear clear Color ≤ 10 Hazen < 5 | Purity (GC) | ≥ 99.5 | % | 99.9 | % |
| Appearance clear clear Color ≤ 10 Hazen < 5 | Identity (IR) | | | | |
| Titrable acid ≤ 0.0008 med/g 0.0001 med/g Density (d 20 °C/20 °C) 0.8090 - 0.8120 0.8109 0.8109 Boiling point 116 - 119 °C 117 °C 2-Butanol (GC) ≤ 0.05 % (v/v) < 0.01 | Appearance | clear | | clear | |
| Density (d 20 °C/20 °C) 0.8090 - 0.8120 0.8109 Boiling point 116 - 119 °C 117 °C 2-Butanol (GC) ≤ 0.05 % (v/v) < 0.01 | Color | ≤ 10 | Hazen | < 5 | Hazen |
| Boiling point 116 - 119 °C 117 °C 2-Butanol (GC) ≤ 0.05 % (v/v) < 0.01 | Titrable acid | ≤ 0.0008 | meq/g | 0.0001 | meq/g |
| 2-Butanol (GC) | Density (d 20 °C/20 °C) | 0.8090 - 0.8120 | | 0.8109 | |
| Butyraldehyde (GC) ≤ 0.01 % (v/v) < 0.01 | Boiling point | 116 - 119 | °C | 117 | °C |
| Dibutyl ether (GC) ≤ 0.1 % (v/v) < 0.1 | 2-Butanol (GC) | ≤ 0.05 | % (v/v) | < 0.01 | % (v/v) |
| Isobutanol (GC) ≤ 0.15 % (v/v) 0.02 % (v/v) Aldehydes conforms conforms conforms Carbonyl compounds (as CO) ≤ 0.01 % ≤ 0.01 % Readily carbonizable substances conforms conforms conforms Al (Aluminium) ≤ 0.00005 % ≤ 0.00005 % B (Boron) ≤ 0.00001 % ≤ 0.00002 % Ba (Barium) ≤ 0.00001 % ≤ 0.00001 % Ca (Calcium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.00002 % ≤ 0.00002 % Cr (Chromium) ≤ 0.00002 % ≤ 0.00002 % Cr (Chromium) ≤ 0.00002 % ≤ 0.00002 % Ce (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00002 % Ni (Nickel) <td< td=""><td>Butyraldehyde (GC)</td><td>≤ 0.01</td><td>% (v/v)</td><td>< 0.01</td><td>% (v/v)</td></td<> | Butyraldehyde (GC) | ≤ 0.01 | % (v/v) | < 0.01 | % (v/v) |
| Aldehydes conforms conforms Carbonyl compounds (as CO) ≤ 0.01 % Readily carbonizable substances conforms conforms Al (Aluminium) ≤ 0.00005 % ≤ 0.00005 % B (Boron) ≤ 0.00001 % ≤ 0.00002 % Ba (Barium) ≤ 0.00001 % ≤ 0.00001 % Ca (Calcium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.000005 % ≤ 0.000005 % Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mi (Nickel) ≤ 0.00002 % ≤ 0.00002 % Ni (Nickel) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Evapora | Dibutyl ether (GC) | ≤ 0.1 | % (v/v) | < 0.1 | % (v/v) |
| Carbonyl compounds (as CO) ≤ 0.01 % ≤ 0.01 % Readily carbonizable substances conforms conforms conforms Al (Aluminium) ≤ 0.00005 % ≤ 0.00005 % B (Boron) ≤ 0.000002 % ≤ 0.000002 % Ba (Barium) ≤ 0.00001 % ≤ 0.00001 % Ca (Calcium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.000002 % ≤ 0.000002 % Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.000002 % Ni (Nickel) ≤ 0.00002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue <td< td=""><td>Isobutanol (GC)</td><td>≤ 0.15</td><td>% (v/v)</td><td>0.02</td><td>% (v/v)</td></td<> | Isobutanol (GC) | ≤ 0.15 | % (v/v) | 0.02 | % (v/v) |
| Readily carbonizable substances conforms conforms Al (Aluminium) ≤ 0.00005 % ≤ 0.00005 % B (Boron) ≤ 0.000002 % ≤ 0.00002 % Ba (Barium) ≤ 0.00001 % ≤ 0.00005 % Ca (Calcium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.000005 % ≤ 0.000005 % Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % < 0.001 | Aldehydes | conforms | | conforms | |
| Al (Aluminium) Al (Aluminium) B (Boron) S 0.000002 % S 0.000002 % S 0.000002 % S 0.000001 % Ca (Calcium) Ca (Calcium) S 0.000005 % Co (Cobalt) Cr (Chromium) S 0.000002 % Cu (Copper) S 0.000002 % Fe (Iron) S 0.00001 % S 0.00001 % Mg (Magnesium) S 0.00001 % S 0.000002 % Mn (Manganese) S 0.000002 % S 0.000002 % Al (Suminium) S 0.000002 % S 0.000002 % S 0.000002 % S 0.000002 % Fo (Iron) S 0.00001 Mg (Magnesium) S 0.00001 Mg (Magnesium) S 0.00001 Mg (Magnesium) S 0.000002 % S 0.000002 % Ni (Nickel) S 0.000001 % Evaporation residue | Carbonyl compounds (as CO) | ≤ 0.01 | % | ≤ 0.01 | % |
| B (Boron) ≤ 0.000002 % ≤ 0.000002 % Ba (Barium) ≤ 0.00001 % ≤ 0.00001 % Ca (Calcium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.000005 % ≤ 0.000005 % Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.0001 % < 0.00001 % Evaporation residue | Readily carbonizable substances | conforms | | conforms | |
| Ba (Barium) ≤ 0.00001 % ≤ 0.00001 % Ca (Calcium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.000005 % ≤ 0.000005 % Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.0001 % < 0.0001 | Al (Aluminium) | ≤ 0.00005 | % | ≤ 0.00005 | % |
| Ca (Calcium) ≤ 0.00005 % ≤ 0.00005 % Cd (Cadmium) ≤ 0.000005 % ≤ 0.000005 % Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % < 0.00001 | B (Boron) | ≤ 0.000002 | % | ≤ 0.000002 | % |
| Cd (Cadmium) ≤ 0.000005 % ≤ 0.000005 % Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % < 0.001 | Ba (Barium) | ≤ 0.00001 | % | ≤ 0.00001 | % |
| Co (Cobalt) ≤ 0.000002 % ≤ 0.000002 % Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % ≤ 0.001 % | Ca (Calcium) | ≤ 0.00005 | % | ≤ 0.00005 | % |
| Cr (Chromium) ≤ 0.000002 % ≤ 0.000002 % Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % ≤ 0.001 % | Cd (Cadmium) | ≤ 0.000005 | % | ≤ 0.000005 | % |
| Cu (Copper) ≤ 0.000002 % ≤ 0.000002 % Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % ≤ 0.001 % | Co (Cobalt) | ≤ 0.000002 | % | ≤ 0.000002 | % |
| Fe (Iron) ≤ 0.00001 % ≤ 0.00001 % Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % < 0.001 % | Cr (Chromium) | ≤ 0.000002 | % | ≤ 0.000002 | % |
| Mg (Magnesium) ≤ 0.00001 % ≤ 0.00001 % Mn (Manganese) ≤ 0.000002 % ≤ 0.000002 % Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % < 0.00001 % Evaporation residue ≤ 0.001 % < 0.001 % | Cu (Copper) | ≤ 0.000002 | % | ≤ 0.000002 | % |
| Mn (Manganese) ≤ 0.000002 % ≤ 0.000001 % ≤ 0.00001 % | Fe (Iron) | ≤ 0.00001 | % | ≤ 0.00001 | % |
| Ni (Nickel) ≤ 0.000002 % ≤ 0.000002 % Pb (Lead) ≤ 0.00001 % ≤ 0.00001 % Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % ≤ 0.0001 % | Mg (Magnesium) | ≤ 0.00001 | % | ≤ 0.00001 | % |
| Pb (Lead) ≤ 0.00001 % | Mn (Manganese) | ≤ 0.000002 | % | ≤ 0.000002 | % |
| Sn (Tin) ≤ 0.00001 % ≤ 0.00001 % Zn (Zinc) ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % < 0.001 | Ni (Nickel) | ≤ 0.000002 | % | ≤ 0.000002 | % |
| $Zn (Zinc)$ ≤ 0.00001 % ≤ 0.00001 % Evaporation residue ≤ 0.001 % < 0.001 % | Pb (Lead) | ≤ 0.00001 | % | ≤ 0.00001 | % |
| Evaporation residue ≤ 0.001 % < 0.001 % | Sn (Tin) | ≤ 0.00001 | % | ≤ 0.00001 | % |
| · | Zn (Zinc) | ≤ 0.00001 | % | ≤ 0.00001 | % |
| Water ≤ 0.1 % < 0.1 % | Evaporation residue | ≤ 0.001 | % | < 0.001 | % |
| | Water | ≤ 0.1 | % | < 0.1 | % |

Date of release (DD.MM.YYYY) 01.02.2023 Minimum shelf life (DD.MM.YYYY) 30.11.2027

Jeannette David

Responsible laboratory manager quality control

This document has been produced electronically and is valid without a signature.