



# WADA & PCC funded Reference Materials

## Catalogue

**December 2023**

*Quality reference materials for identification and calibration are essential to making accurate chemical measurements in sport doping control.*

| **Category**  **Steroids and steroid metabolite** | **Description** | **NMI reference** | **Unit of issue (mg)** | Domestic Cost (A$) (excl GST) | International  Cost (A$) |
| --- | --- | --- | --- | --- | --- |
| 1-Androstendione | 1-Androstendione (5α-Androst-1-en-3,17-dione) \* | D845 | 1 (ampoule) | 228 | 319 |
| Danazol metabolites | 2-Hydroxymethylethisterone **†** | D920b | 1 (ampoule) | 121 | 169 |
| Finasteride metabolites | Carboxy finasteride **†** | S045 | 1 (ampoule) | 121 | 169 |
| 4-Hydroxy steroids | 4-Hydroxy-estr-4-en-3,17-dione **†** | S043 | 1 (ampoule) | 121 | 169 |
| 4-Hydroxy steroids | 1,6,7-d3-4-Hydroxyandrostendione | S046 | 0.2 (ampoule) | 121 | 169 |
| 17-Methylclostebol metabolite | 4-Chloro-17-methyl-androst-4-ene-3, 17-diol **†** | S044 | 1 (ampoule) | 121 | 169 |
| Methyldienolone | Methyldienolone † | D916b | 1 (ampoule) | 121 | 169 |
| 7-Methylnandrolone and metabolites | 7-Methylnandrolone | S048 | 1 (ampoule) | 121 | 169 |
| 7-Methylnandrolone and metabolites | 7-Methyl-5-estran-3-ol-17-one (major metabolite) \* | S047 | 1 (ampoule) | 121 | 169 |
| 7-Methylnandrolone and metabolites | 7-Methyl-estr-4-ene-3-ol-17-one (minor metabolite) \* | S050 | 1 (ampoule) | 121 | 169 |
| Nandrolone metabolites | 19-Noretiocholanolone sulfate (Na salt)\* | D849 | Exhausted | 121 | 169 |
| Nandrolone metabolites | Epinandrolone sulfate**†** TEA salt | D783b | 5 | 121 | 169 |
| Norbolethone and metabolites | Norbolethone**†**  (13β,17-Diethyl-gonan-4-ene-17-ol-3-one) | D825c | 1 (ampoule) | 121 | 169 |
| Norbolethone and metabolites | 13β,17-Diethyl-5-gonane-3, 17-diol  (major metabolite) **†** | D818b | 1 (ampoule) | 121 | 169 |
| Norbolethone and metabolites | 13β,17-Diethyl-5-gonane-3, 17-diol  (minor metabolite) **†** | D820b | 1 (ampoule) | 121 | 169 |
| Testosterone metabolites (including internal standards) | 5-Androstane-3α,17β-diol-3--glucuronic acid **†** | S003b | 1 | 155 | 218 |
| Testosterone metabolites (including internal standards) | d4-5-Androstan-3,17-diol-17-*O*--glucuronic acid \* | S009 | 1 | 121 | 169 |
| Testosterone metabolites (including internal standards) | d4-5-Androstan-3,17-diol-3-*O*--glucuronic acid \* | S010 | 1 | 121 | 169 |
| Testosterone metabolites (including internal standards) | d3-5-Androstan-3,17-diol-17-*O*--glucuronic acid \* | S011 | 1 | 121 | 169 |
| Testosterone metabolites (including internal standards) | d5-5-Androstan-3,17-diol-3-*O*--glucuronic acid \* | S012 | 1 | 121 | 169 |
| Testosterone metabolites (including internal standards) | d4-Epitestosterone-17-*O*--glucuronic acid \* | S023 | 1 (ampoule) | 121 | 169 |
| Testosterone metabolites (including internal standards) | d5-Etiocholanolone-3-*O*--glucuronide sodium salt \* | S020 | 1 (ampoule) | 121 | 169 |
| 1-Testosterone\* | 5α-Androst-1-ene-3-ol-17-one\* (Ampouled) | D832 | 0.2 (ampoule) | 121 | 169 |
| Oral Turinabol metabolite | 6β-Hydroxy-oral turinabol **†** | D615b | 1 (ampoule) | 121 | 169 |
| Prohormones and metabolites | 3,5-Cyclo-5-androstan-6-ol-17-one **†** | S039 | 1 (ampoule) | 121 | 169 |
| Prohormones and metabolites | 16α-Hydroxyandrosterone \* | D843 | 1 (ampoule) | 121 | 169 |
| Prohormones and metabolites | 6-Hydroxyetiocholanolone \* | D867 | 1 (ampoule) | 121 | 169 |
| Prohormones and metabolites | 4-Hydroxy DHEA \* | D834 | 1 (ampoule) | 121 | 169 |
| Prohormones and metabolites | 7-Keto DHEA \* | D833 | 10 | 121 | 169 |
| Prohormones and metabolites | 7-Hydroxy DHEA \* | D875 | 1 (ampoule) | 121 | 169 |
| Prohormones and metabolites | 7-Hydroxy DHEA \* | D865b | 1 (ampoule) | 121 | 169 |
| Prohormones and metabolites | 16-Hydroxy DHEA \* | D844 | 1 | 121 | 169 |
| Prohormones and metabolites | 3-Hydroxy-4-estren-17-one \* | D873 | 1 | 121 | 169 |
| Prohormones and metabolites | 3-Hydroxy-4-estren-17-one \* | D866 | 1 | 121 | 169 |
| Anti-inflammatory metabolites | -Hydroxycarprofen† | D1072 | 5 | 121 | 169 |
| REV-ERB agonist SR9009 metabolites | *N*-[(4-Chlorophenyl)methyl]-5-nitro-2-thiophenemethanamine hydrochloride**†** | D1066 | 1 (ampoule) | 121 | 169 |
| REV-ERB agonist SR9009 metabolites | Ethyl *N*-(5-nitro-2-methylthiophene)-3-aminomethylpyrrolidine-1-carboxylate**†** | D1067 | Exhausted | 121 | 169 |
| Stimulants | Formoterol fumarate**†** | D1065 | 25 | 121 | 169 |
| Stimulants | Higenamine hydrochloride† | D1070 | 25 | 121 | 169 |
| Steroid carbon isotope ratio standard mixture reference material for GCC-IRMS | Carbon isotope delta value reported for 5-androstan-3-ol acetate (13CVPDB / ‰ -32.00 ± 0.09), 5-androstan-3-ol-17-one acetate (13CVPDB / ‰ -32.58 ± 0.03), 5-androstan-3-ol-11,17-dione acetate (13CVPDB / ‰ -16.50 ± 0.03), and 5-cholestane (13CVPDB / ‰ -24.90 ± 0.05) **†** | CU-PCC 33-2 | Ampoule | 121 | 169 |
| Steroid carbon isotope ratio standard mixture reference material for GCC-IRMS | Carbon isotope delta value reported for 5-androstan-3-ol-17-one (13CVPDB / ‰ -28.75 ± 0.01), 5-androstan-3-ol-17-one (13CVPDB / ‰ -26.74 ± 0.03), 5-pregnan-3, 20-diol (13CVPDB / ‰ -18.65 ± 0.03) **†** | CU-PCC 34-3 | Ampoule | 121 | 169 |
| Steroid carbon isotope ratio standard mixture reference material for GCC-IRMS | Carbon isotope delta value reported for 5-androstan-3-ol-17-one (13CVPDB / ‰ -27.09 ± 0.07) **†** | CU-PCC 40-1 | Ampoule | 121 | 169 |
| Steroid carbon isotope ratio standard mixture reference material for GCC-IRMS | Carbon isotope delta value reported for 5-androstan-3-ol-17-one acetate (13CVPDB / ‰ -32.82 ± 0.02) **†** | CU-PCC 41-1 | Ampoule | 121 | 169 |
| Steroid carbon isotope ratio standard mixture reference material for GCC-IRMS | Carbon isotope delta value reported for 5-cholestane (13CVPDB / ‰ -25.03 ± 0.01) **†** | CU-PCC 42-1 | Ampoule | 121 | 169 |
| Steroid carbon isotope ratio standard mixture reference material for GCC-IRMS | Carbon isotope delta value reported for 5-androstan-3-ol-17-one acetate (13CVPDB / ‰ -32.73 ± 0.06), 5-androstan-3, 17-diacetate (13CVPDB / ‰ -30.19 ± 0.07), 5-cholestane (13CVPDB / ‰ -24.83 ± 0.13), and 5- pregnan-3, 20-diacetate (13CVPDB / ‰ -21.16 ± 0.08) **†** | CU-PCC 44-1 | Ampoule | 121 | 169 |
| Steroid Matrix Reference Material | Mass fraction of 19-Norandrosterone (221.4 ng/g) in 1,2-dimethoxyethane (1 mL) \* | MX003 | Ampoule | 182 | 266 |
| Steroid Matrix Reference Material | Carbon Isotope Delta Value (13CVPDB / ‰) of 19-norandrosterone (-29.7 ± 0.8) in  Water containing 20% Methanol 1 (mL)\* | MX016 | Ampoule | 264 | 370 |
| Steroid Matrix Reference Material | Mass fraction of testosterone metabolites in freeze dried human urine: 5α-androstane-3α-17β-diol (41.2 ± 1.8 ng/g), 5β‑androstane-3α-17β-diol (66.0 ± 2.9 ng/g), androsterone 1652 ± 29 ng/g), etiocholanolone (1359 ± 34 ng/g), testosterone (88.1 ± 4.2 ng/g), epitestosterone (21.9 ± 1.0 ng/g), T/E mass ratio (4.03 ± 0.26)\* | MX017i | Bottle | 396 | 554 |
| Steroid Matrix Reference Material | Carbon Isotope Delta Value (13CVPDB / ‰) in freeze dried human urine: 19-norandrosterone (-29.82 ± 0.41) \*, Etiocholanolone (-23.60 ± 0.51), Androsterone (-22.27 ± 0.57), Testosterone (-27.48 ± 0.73), Epitestosterone (-23.74 ± 0.80), 5α-androstane-3α,17β-diol (-23.83 ± 0.90), 5β-androstane-3α,17β-diol (-23.76 ± 0.61), 11-oxoetiocholanolone (-22.23 ± 0.48), 11β-hydroxyandrosterone (-22.38 ± 0.64), Pregnanediol (-22.79 ± 0.77), 16-androstenol (-22.51 ± 0.60 | MX017ii | Bottle | 396 | 554 |
| Steroid Matrix Reference Material | Carbon Isotope Delta Value (13CVPDB / ‰). Three ampoules containing dry steroid mixtures. The ampoules contain approximately 400 µg of each steroid with the exception of 16-androstenol supplied close to 280 µg.  **Vial 1:** etiocholanolone (-27.94 ± 0.24), androsterone (-27.79 ± 0.21),  11-oxoetiocholanolone (-13.58 ± 0.23), testosterone (-27.87 ± 0.24),  11β-hydroxyetiocholanolone -29.51 ± 0.36) **Vial 2:** 5β-androstane-3α-17β-diol (-29.86 ± 0.16), 5α androstane-3α-17β-diol (-31.14 ± 0.24), pregnanediol (-16.79 ± 0.42),  epitestosterone (-30.17 ± 0.36),  11β-hydroxyandrosterone (-28.59 ± 0.22) **Vial 3:** 16-androstenol (-30.96 ± 0.37), dehydroepiandrosterone (-31.63 ± 0.54), testosterone (-22.52 ± 0.33) **†** | MX018 | 3 Ampoules | 264 | 370 |
| Steroid Matrix Reference Material | Carbon Isotope Delta Value (13CVPDB / ‰):  Boldenone (–30.38 ± 0.29)  Boldenone\* Metabolite 1 (–30.38 ± 0.29) \* | MX020 | Ampoule | 264 | 370 |
| Steroid Matrix Reference Material | Carbon Isotope Delta Value (13CVPDB / ‰):  Formestane (–30.71 ± 0.48)\* | MX021 | Ampoule | 264 | 370 |

\*Production funded by the World Anti-Doping Agency.

**†**Production funded by the Partnership for Clean Competition.

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### Restrictions on Issue

The steroid and steroid metabolite reference materials are generally available to WADA accredited laboratories. Laboratories which **do not have** WADA accreditation must provide documented evidence, signed by the company manager, that these materials will not be used for unethical purposes related to commercial human sports drug analysis and that they will not be provided to other laboratories who may be engaged in this analysis.

### NMI Reference Materials

Reference Materials (RMs) produced by NMI are NATA accredited to ISO 17034:2016(E) and prepared in accordance with our accreditation.

RMs have demonstrated homogeneity and stability and are supplied with:

* Product information sheet
* Safety Data Sheet (SDS)

### NMI Certified Reference Materials

Certified Reference Materials (CRMs) produced by NMI have established metrological traceability to the SI unit for mass (kg).

CRMs have certified purity values, stated as a mass fraction with associated uncertainty and are supplied with:

* Certificate of Analysis (CoA)

### Candidate materials

All care is taken in the storage and handling of these materials however they are not independently certified by NMI.

Individual unit issue size varies depending on the amount available and the difficulty of obtaining the replacement compound. They can be provided with the analytical information available.

### Ampouled Materials

For each ampouled reference material the product information sheet / certificate of analysis will state the mass of analyte dispensed into each ampoule.

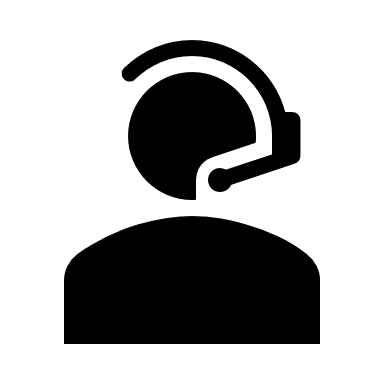
### GST charges (Australian customers only)

The prices quoted are EXCLUSIVE of Goods and Services Tax (GST). The current GST rate is 10%. Upon delivery of the requested reference materials NMI will issue valid tax invoices and, if required, adjustment notes as per the requirements of the GST legislation.

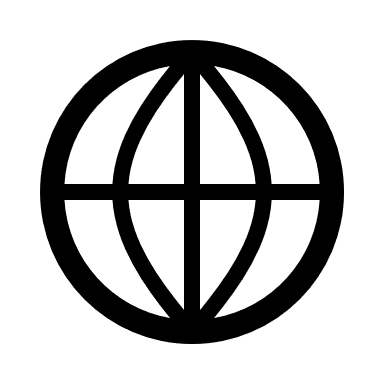
### Delivery Fee

Delivery and handling fees apply for all orders and vary with destination. Please check the applicable rates when ordering.

### For further information

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NMI reference materials available globally through our international partner:

LGC Standards

Web: [www.lgcstandards.com](http://www.lgcstandards.com)



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