NUCLEOTIDE SOLUTIONS

dNTPs

Quality & Performance

Technical Dossier

Analytical quality. Experimental evidence.



NMR / HPLC / BIOLOGICAL QC / PCR PERFORMANCE

Tinzyme Co., Limited

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01 / PRODUCT QUALITY

dNTPs. Evidence at every stage.

A complete view of analytical quality, contamination checks and amplification performance.

≥99.0%
HPLC purity reported

Host DNA Free
Source-reported DNA absence

Long PCR >30KB
Long-range amplification

Stable for 5 years (-20°C), 10 days at RT & 50 freeze-thaw cycles.

Quality and performance evidence

Evaluation	Reported result / evidence	Page
Chemical quality	Purity, diphosphates, pH, concentration and UV identity	2
31P-NMR screening	Four nucleotide spectra; impurity screening described	3
HPLC characterization	Four chromatograms; ≥99.0% purity reported	4
Biological QC	DNase, RNase and nicking: negative; other absence claims	5
Bacterial DNA	No visible signal in sample lanes; positive control shown	5
RT-PCR / low-input PCR	520 bp beta-actin and genomic DNA input series	5
Long PCR / real-time PCR	Reported 30 kb target and qPCR amplification curves	6
Stability	50-cycle, 10-day thermal and five-year observations	7

Four bases. Multiple formulation options.

Tinzyme supplies separate 100 mM dATP, dCTP, dGTP and dTTP solutions and balanced dNTP mixes at 2.5, 10 and 25 mM each. The dossier also covers dUTP and lists dITP, nucleotide sets and powder formats.

The following pages reproduce the supplied dossier specifications and every experiment image. Acceptance specifications, source-reported statements, visible assay results and supplemental website stability data are identified separately. [1-3]

02 / ANALYTICAL CHARACTERISTICS

Complete source specification profile.

Five individual nucleotide solutions. Source values reproduced for traceability. [1]

Physicochemical and quality characteristics

Attribute	dATP	dCTP	dGTP	dTTP	dUTP
Appearance	Clear, colorless	Clear, colorless	Clear, colorless	Clear, colorless	Clear, colorless
Concentration	100 mM ±5%	100 mM ±5%	100 mM ±5%	100 mM ±5%	100 mM ±5%
UV peak, nm (pH 7.0)	259 ±2	272 ±2	253 ±2	267 ±2	267 ±2
Extinction coefficient*	15.4	9.1	13.7	9.6	9.9
A250/A260 (pH 7.0)	0.78 ±0.03	0.82 ±0.03	1.15 ±0.04	0.65 ±0.03	0.73 ±0.03
A280/A260 (pH 7.0)	0.15 ±0.02	0.98 ±0.05	0.66 ±0.03	0.74 ±0.05	0.38 ±0.03
pH at 22-25°C	7.0 ±0.1	7.0 ±0.1	7.0 ±0.1	7.0 ±0.1	7.0 ±0.1
dNTP, HPLC area	≥99.0%	≥99.0%	≥99.0%	≥99.0%	≥99.0%
dNDP, HPLC area	<0.7%	<0.7%	<0.7%	<0.7%	<0.7%
DNase / RNase / nicking	Negative	Negative	Negative	Negative	Negative
Storage	-20°C	-20°C	-20°C	-20°C	-20°C
Stability stated	36 months	36 months	36 months	36 months	36 months

Chemical identity: sodium salt solutions

Attribute	dATP	dCTP	dGTP	dTTP	dUTP
Formula	C10H13N5Na3O12P3	C9H13N3Na3O13P3	C10H13N5Na3O13P3	C10H14N2Na3O14P3	C9H12N2Na3O14P3
Molecular weight	557.2	533.1	573.1	548.1	534
CAS no.	1927-31-7	102783-51-7	93919-41-6	18423-43-3	102814-08-4

* Extinction coefficients are transcribed as numerical values; the source uses the unit notation E × mmol^-1 × cm^-1. The source identifies each nucleotide as a 2'-deoxynucleoside-5'-triphosphate sodium salt.

Edition note: current individual product pages specify 100 mM ±3% rather than the source ±5%; current dUTP values include a 262 ±2 nm UV peak and molecular weight 534.1. The 36-month stability statement above is from the source dossier; current labels and lot documentation govern use. [1,2]

03 / PHOSPHORUS NMR

31P-NMR screening. Four nucleotide spectra.

Source-reported per-lot screening for polyphosphate impurities and PCR inhibitors. [1]

Figure 1. 31P-NMR of dATP

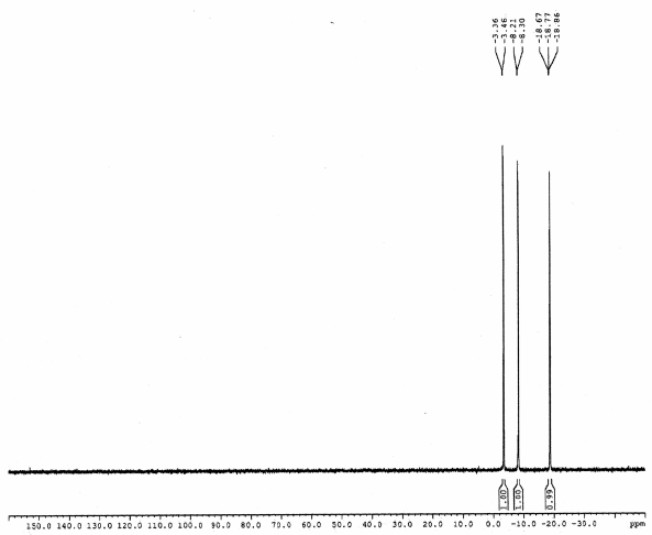


Figure 2. 31P-NMR of dGTP

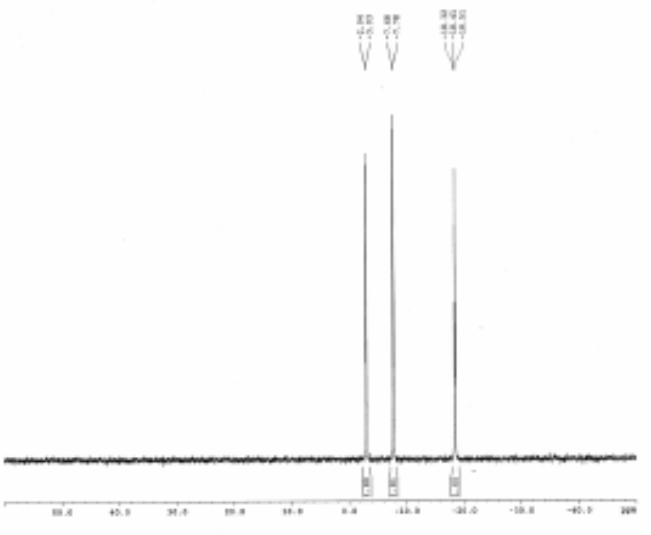


Figure 3. 31P-NMR of dCTP

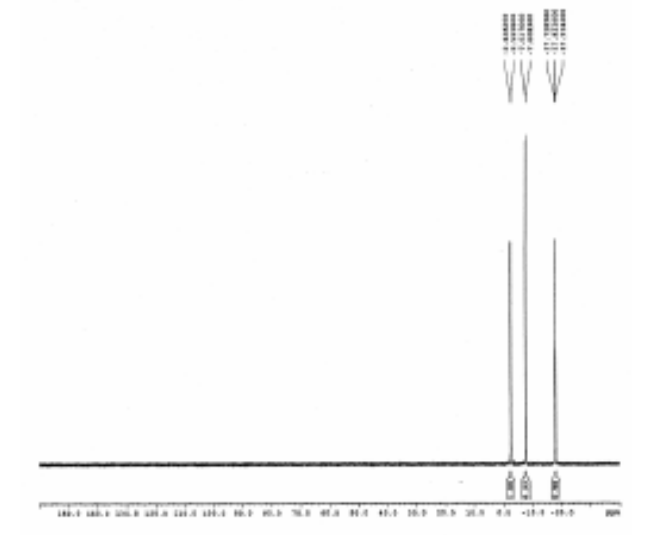
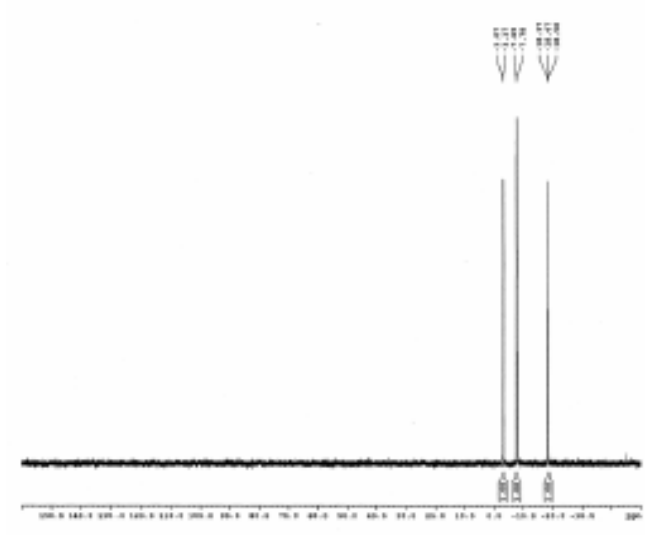


Figure 4. 31P-NMR of dTTP



Reported QC result: The dossier describes elimination of tetraphosphates, pyrophosphates and PCR-specific inhibitors, with 31P-NMR used for screening.

Original spectra are reproduced without redrawing peaks. No numerical impurity integrations, acceptance cutoffs or instrument acquisition parameters accompany these figures. [1]

04 / HPLC

Chromatographic evidence. All four nucleotides.

HPLC purity of at least 99.0% is reported for each nucleotide in the source dossier. [1]

Figure 5. HPLC of dATP

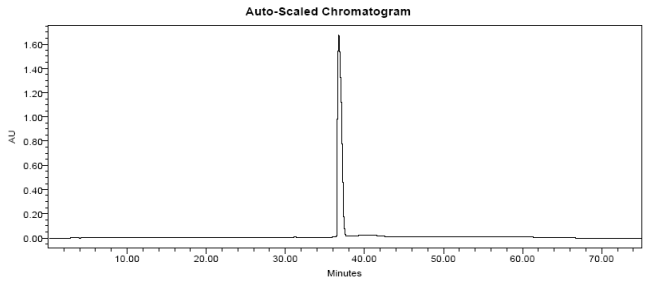


Figure 6. HPLC of dGTP

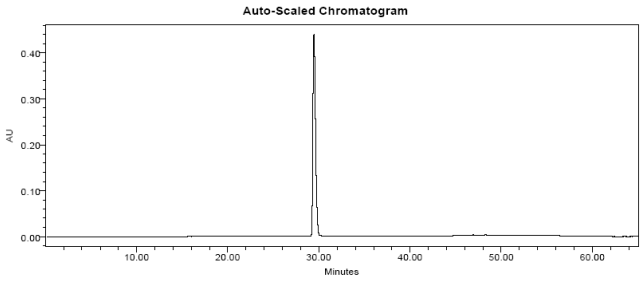


Figure 7. HPLC of dCTP

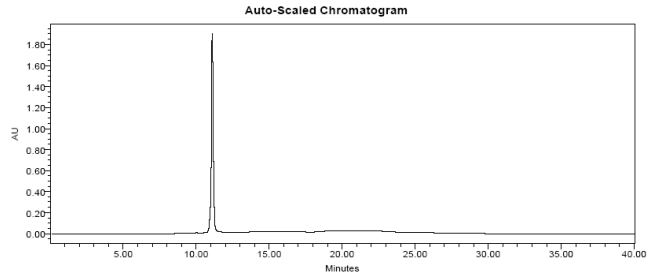
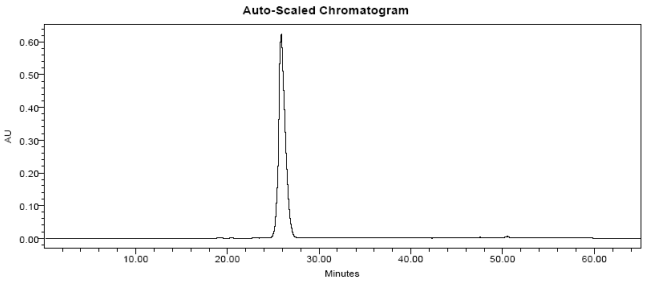


Figure 8. HPLC of dTTP



What the source reports

Triphosphate content: ≥99.0% by HPLC area.
Diphosphate content: <0.7% by HPLC area in the characteristics table.
The chromatograms provide a visual record for dATP, dGTP, dCTP and dTTP.

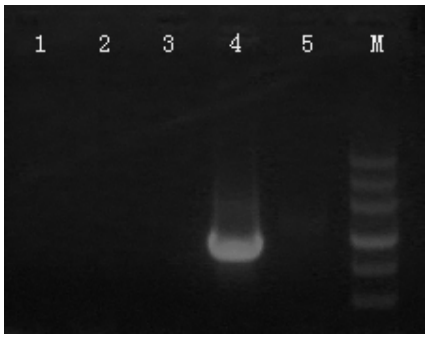
Chromatograms are reproduced at their original aspect ratios. The source supplies no peak-area integration tables, individual purity readouts or chromatographic method parameters for these images; no exact per-trace purity has been inferred. [1]

05 / BIOLOGICAL QC AND ENDPOINT PCR

Clean inputs. Visible amplification.

Contamination controls, reverse transcription PCR and low-input genomic DNA PCR. [1]

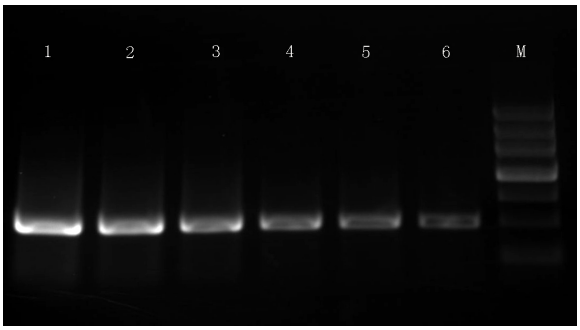
Figure 9. Bacterial DNA: controlled 16S assay



Observed: No visible assay band in Tinzyme sample lanes 2-3; a band is visible in positive-control lane 4.

Loaded volume: 5 µL per lane. Lane 1: negative control. Lanes 2-3: Tinzyme dNTP mix. Lane 4: positive control. Lane 5: another supplier. M: Marker III.

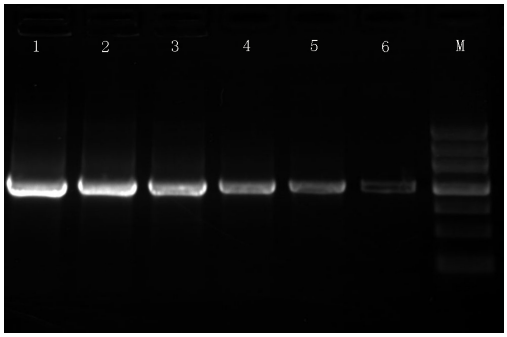
Figure 10. RT-PCR: 520 bp beta-actin product



Observed: Visible amplification products across the displayed RNA-input series, with lower band intensity at lower input.

Human lung total RNA: 10, 5, 1, 0.5, 0.1 and 0.05 ng (lanes 1-6). Reverse transcription: 20 µL. cDNA input to PCR: 2 µL. Target: beta-actin, 520 bp. Gel load: 5 µL per lane. M: Marker III.

Figure 11. Low-input PCR: human genomic DNA



Observed: Visible products across the displayed template series, with weaker bands toward the lowest inputs.

Human genomic DNA: 10, 5, 1, 0.5, 0.1 and 0.01 ng (lanes 1-6). Reaction: 50 µL. Gel load: 5 µL per lane. M: Marker III.

Additional source-reported QC: DNase, RNase and nicking activity: negative. Absence of protease activity and human, viral and bacterial DNA is also stated. No separate assay figures, detection limits or protocols are supplied for the other absence claims. Endpoint gels show qualitative results; input ranges are not validated detection limits.

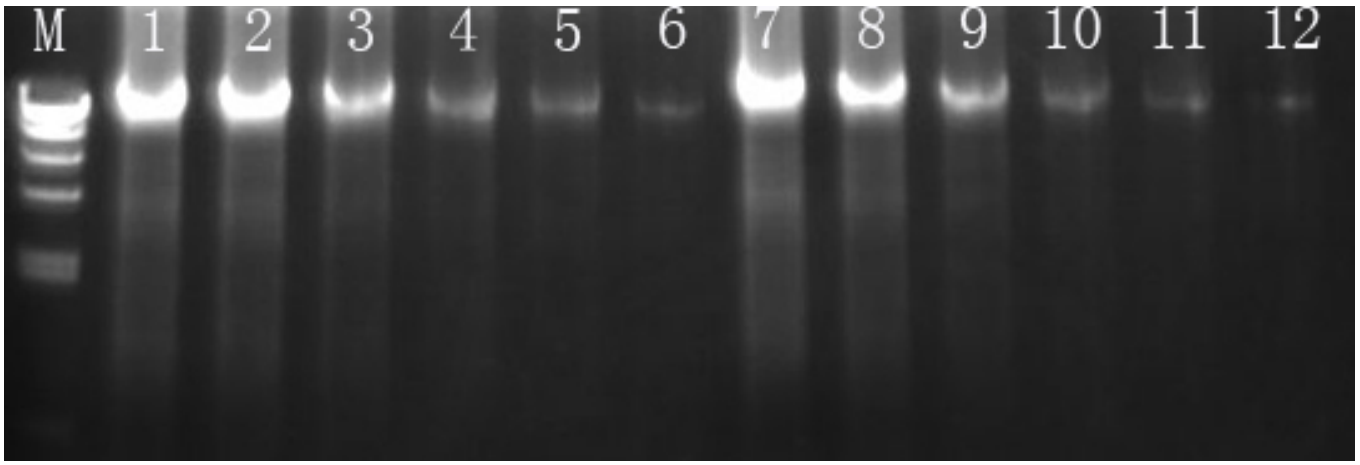
06 / LONG PCR AND REAL-TIME PCR

Performance in amplification workflows.

Reported target size and experimental inputs accompany the original figures. [1]

Figure 12. Long PCR: reported 30 kb target

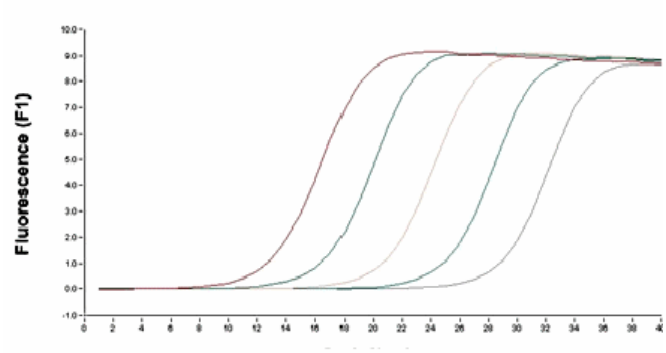
Lambda-phage DNA, 50 µL reactions. Tinzyme dNTPs: lanes 1-6; another supplier: lanes 7-12. M: lambda DNA/Hind III marker. Loaded volume: 5 µL per lane.



Template, ng	2.5	1.25	0.5	0.1	0.05	0.01
Tinzyme lane	1	2	3	4	5	6
Comparator lane	7	8	9	10	11	12

Visible amplification products are shown across the displayed input series; band intensities vary. The gel is a qualitative comparison, without normalized yield or replicate statistics. Source resolution limits fine band interpretation.

Figure 13. Real-time PCR amplification curves



The source identifies this as a Tinzyme dNTP qPCR experiment. Sigmoidal fluorescence curves with different amplification onsets are visible.

No Cq table, dilution identities, efficiency, R-squared or replicate statistics are supplied. No universal detection limit or maximum amplicon length is established by these figures.

07 / SUPPLEMENTAL MEASURED STABILITY

Stress-tested. Results reported.

Official website results for selected lots of four individual 100 mM nucleotide solutions. [3]

50 freeze-thaw cycles: HPLC purity (%)

Nucleotide	Lot no.	Initial	After 50 cycles
dATP	120201-2	99.20	98.80
dCTP	120101-2	99.90	99.60
dGTP	110401	99.50	99.20
dTTP	110303-1	99.80	99.40

Purity changed by 0.30-0.40 percentage points. dATP reached 98.80%, below the 99% release specification.

10-day thermal exposure: HPLC purity (%)

Nucleotide	Lot no.	Initial	25°C	37°C
dATP	101101	99.60	99.40	95.00
dCTP	101101	99.80	99.90	96.70
dGTP	101101	99.70	99.50	95.00
dTTP	101101	99.50	99.40	95.60

Day-10 purity: 99.40-99.90% at 25°C; 95.00-96.70% at 37°C.

Five-year storage observations: HPLC purity (%)

Nucleotide	Lot no.	Initial	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
dATP	090901-1	99.80	99.68	99.60	99.54	99.27	99.30
dCTP	090301-1	99.82	99.73	99.70	99.65	99.60	99.57
dGTP	90101	99.54	99.47	99.44	99.39	99.35	99.36
dTTP	91001	99.77	99.63	99.60	99.59	99.31	99.28

Selected-lot observations are not a shelf-life or shipping-temperature guarantee. The website report describes standard storage but does not specify its temperature, replication or uncertainty. These results apply to the four individual stocks tested. Follow current labels. [3]

08 / PORTFOLIO AND TECHNICAL REFERENCES

Product formats for your workflow.

Product selection and documentation, with ordering information kept secondary.

Tinzyme product portfolio

Product	Catalog no.	Stock concentration
dNTP Mix, 2.5 mM each	DN30	2.5 mM each / 10 mM total
dNTP Mix, 10 mM each	DN31	10 mM each / 40 mM total
dNTP Mix, 25 mM each	DN32	25 mM each / 100 mM total
dATP, 100 mM	D1331	100 mM
dGTP, 100 mM	D2331	100 mM
dCTP, 100 mM	D3331	100 mM
dTTP, 100 mM	D4331	100 mM
dUTP, 100 mM	D5331	100 mM

Also listed in the source: four-vial 100 mM dNTP sets; 100 mM dITP; dNTP powder; custom, bulk and OEM nucleotide services. Confirm current availability and ordering codes with Tinzyme.

Handling and application scope

The source states 36 months at constant -20°C or -70°C, with aliquoting and avoidance of repeated freeze-thaw; shipping on dry ice or blue ice. Current product pages recommend -20°C for daily/weekly use and -70°C for long-term, infrequent use. Follow current product and lot documentation.

Applications listed in the dossier: standard and long-range PCR, qPCR, RT-PCR, cDNA synthesis, sequencing, site-directed mutagenesis, microarrays and labeling. Validate the complete workflow for its intended use.

Source references and product links

[1] Supplied Tinzyme dNTP Quality Control and Performance dossier: full characteristics table and Figures 1-13.
[2] Official current product pages: DN30 | DN31 | DN32 | D1331 | D2331 | D3331 | D4331 | D5331.
[3] Stability Test Report for dNTPs (website supplemental data).
Website and brand styling checked October 26, 2026.

Full nucleotide catalog | Technical documents and supply: sales@tinzyme.com

Quality in every building block.

High-purity nucleotide solutions for
DNA amplification and synthesis workflows.

TECHNICAL DOCUMENTATION & SUPPORT

Product specifications and lot documentation

Application discussions and formulation support

Custom formats and bulk supply inquiries

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