

# Thermo Scientific TheraPure<sup>®</sup> RNA 2'-TBDMS & 2'-OMe Phosphoramidites



**Controlled critical impurities and water content for stringent applications of oligonucleotide synthesis**

Thermo Scientific TheraPure<sup>®</sup> phosphoramidites are designed for oligonucleotide manufacturers requiring highly defined impurity profiles and strictly controlled processes.

- Low Critical Impurities**

No single reactive P(III) species > 0.3%

Sum of non-primary peaks at 140-152 ppm ≤ 0.5 mol %

- Control of Residual Water**

Water content of ≤ 0.3% contributes to higher coupling efficiency and solution stability

- Documented Process Control**

Manufactured in ISO9001 registered facility

Thoroughly documented processes provide consistent product quality with minimal batch to batch variability

- Supply Chain Control**

Utilize Thermo Fisher Scientific global supplier management program

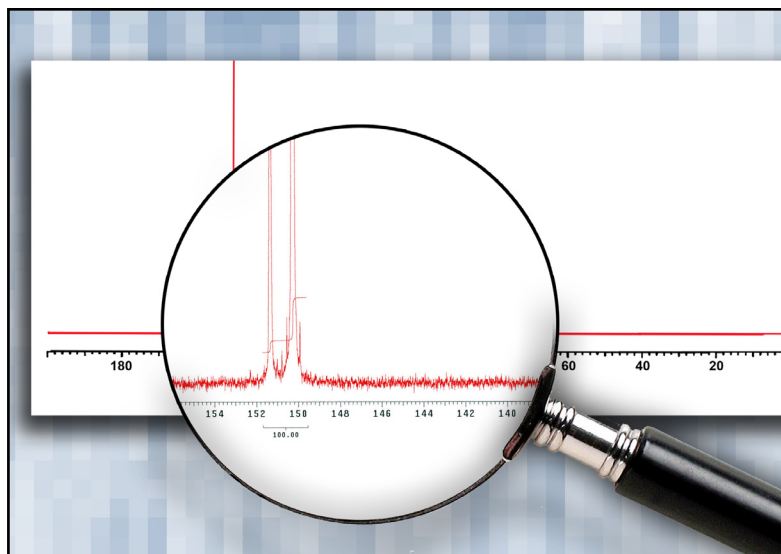
Produced with materials of no known animal source

- Kilogram to Ton Quantities**

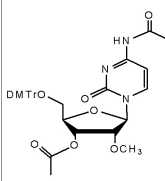
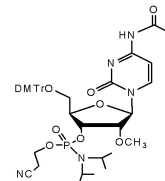
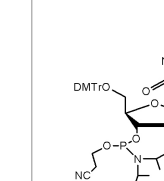
Highly scalable amidite manufacturing facilities enable us to meet the requirements of companies manufacturing oligonucleotides on a very large scale

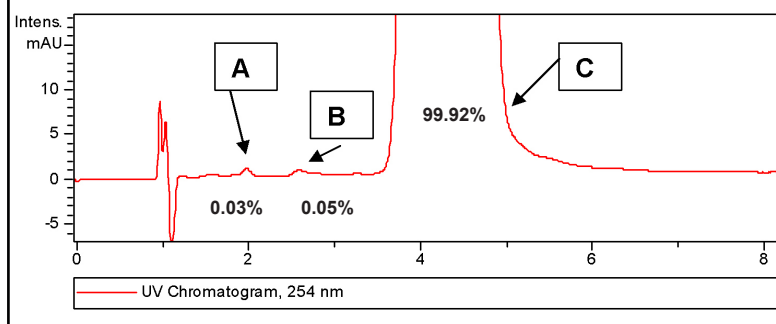
- Available in standard or fast base deprotection options**

Thermo Fisher Scientific (Milwaukee) LLC is a licensed supplier of PAC protected phosphoramidites and 2'-OMe phosphoramidites.



Typical NMR scan of TheraPure RNA phosphoramidite  
Scale expansion reveals no contaminants in 140-152 ppm critical range.

Peak	A	B	C
m/z + H <sup>+</sup>	644.0	818.4	802.6
Structure			
Chemical Formula	C <sub>35</sub> H <sub>37</sub> N <sub>3</sub> O <sub>9</sub>	C <sub>42</sub> H <sub>52</sub> N <sub>5</sub> O <sub>10</sub> P	C <sub>42</sub> H <sub>52</sub> N <sub>5</sub> O <sub>9</sub> P
Exact Mass	643.25	817.35	801.35

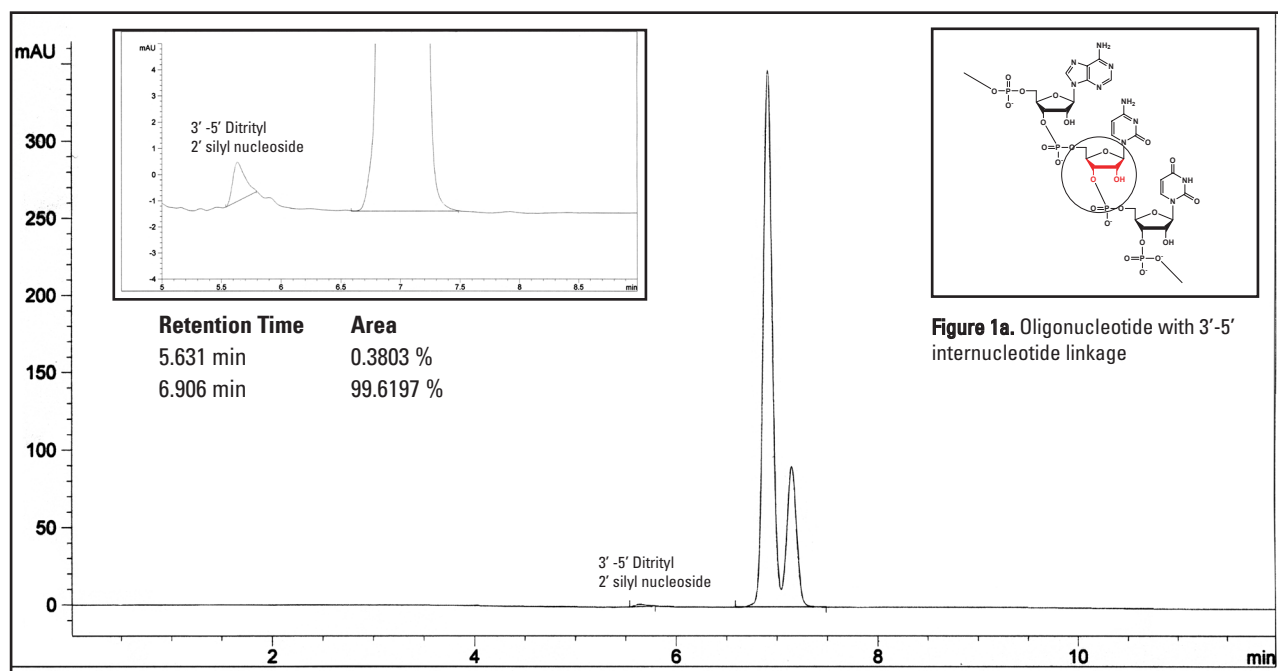


Impurity Profile of TheraPure 2'-OMe C Phosphoramidite by LC-MS

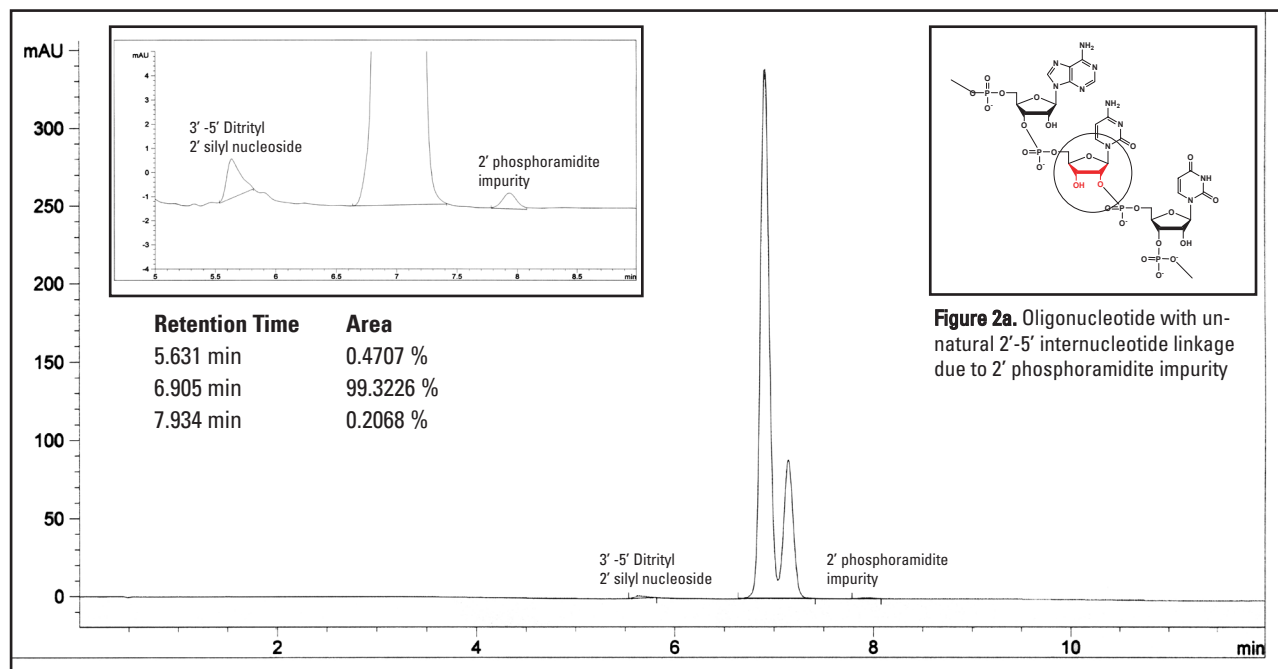
## 2' Phosphoramidite Impurity

The 2' phosphoramidite can form during the phosphitylation reaction by migration of 2'-TBDMS group in the protected nucleoside from 2' to 3' position. This migration would allow for phosphitylation of the free 2' position resulting in formation of unnatural 2'-5' internucleotide linkage when incorporated into an oligonucleotide (Figure 2a).

Manufacturing processes developed at Thermo Fisher Scientific (Milwaukee) produce no detectable 2' phosphoramidite impurity from the final product. The absence of 2' phosphoramidite is confirmed by HPLC analysis (Figures 1 and 2).



**Figure 1.** HPLC profile of TheraPure RNA phosphoramidite.



**Figure 2.** HPLC profile of TheraPure rC phosphoramidite spiked with 0.2% of 2' phosphoramidite. Contaminating 2' phosphoramidite elutes at 7.9 min.

Very low levels of critical reactive impurities and controlled water content make TheraPure RNA phosphoramidites ideal for challenging RNA syntheses.

## Minimal Critical P(III) Impurities:

No single impurity greater than > 0.3%

Reduced risk of 3'-2' misincorporation during oligonucleotide synthesis

Reduced accumulation of by-products which can be difficult to separate during final HPLC purification

## Product Specifications

<sup>31</sup> P NMR Purity	Sum of non-primary peaks at 140-152 ppm ≤ 0.5 mol %	HPLC Purity	≥ 99%
Impurity levels by <sup>31</sup> P NMR	No single reactive P(III) species > 0.3%	Water Content	≤ 0.3%
<sup>31</sup> P NMR Purity	≥ 99%	Material Origin	Manufactured with materials having no known animal source

## Ordering Information

Product Name	Product #
TheraPure Bz rA Phosphoramidite	27-1903
TheraPure PAC rA Phosphoramidite	27-1803
TheraPure rU Phosphoramidite	27-1804
TheraPure Ac rC Phosphoramidite	27-1805
TheraPure iBu rG Phosphoramidite	27-1906
TheraPure iPrPAC rG Phosphoramidite	27-1806
TheraPure 2'-OMe Bz A Phosphoramidite	27-2042
TheraPure 2'-OMe Ac C Phosphoramidite	27-2043
TheraPure 2'-OMe U Phosphoramidite	27-2044
TheraPure 2'-OMe iBu Phosphoramidite	27-2046

## Related Products

Thermo Scientific TheraPure® DNA phosphoramidites

Thermo Scientific DNA phosphoramidites

Thermo Scientific RNA phosphoramidites

Thermo Scientific DyLight™ Phosphoramidites

Thermo Scientific RNA CPG Synthesis Supports

For more information visit the web site at [www.thermo.com/milwaukee](http://www.thermo.com/milwaukee)

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## Thermo Fisher Scientific (Milwaukee) LLC

We develop integrative partnerships with customers across the globe to provide premium molecular biology reagents and innovative services.

These products are used in a variety of applications to advance the development of biotechnology research, diagnostic and therapeutic applications.

### ISO9001 Registered since 1995

- Well documented, validated processes to support regulatory requirements
- Rigorous process change control ensures consistency, compliance and conformance of materials
- Formalized corrective and preventative actions systems reduce potential for customer issues up front

### Customer Service

- Customer Service Representatives have depth and breadth of cross functional experience enabling them to service your complex needs
- A dedicated Customer Service Representative is assigned to your account to provide direct, personalized service

### Ability to Deliver at Large Scale

- Over 100 combined years of manufacturing experience enable us to meet your scale-up requirements

### On-time Delivery

- Average greater than 98% on-time delivery
- 24 to 48 hour delivery on stock items

### Flexible Packaging

- Custom and bulk packaging available

### Custom Chemistry Development

- Flexible, documented processes allow efficient development of complex custom chemistries
- In-house analytical capabilities include LC-MS, GC-MS, HPLC, <sup>31</sup>P NMR and <sup>1</sup>H NMR