

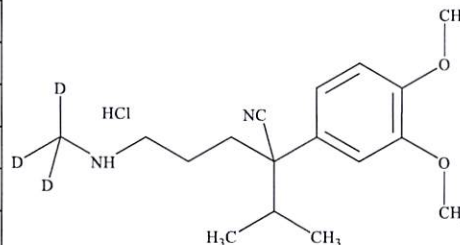
Certificate of Analysis

 Certificate No.: **20260618007**

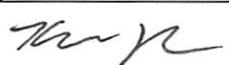

Date: June 18, 2026

Retest date: June 15, 2029

Compound Name: Verapamil EP Impurity F-d ₃ HCl (Verapamil USP Related Compound A-d ₃)	
Synonyms:	2-(3,4-dimethoxyphenyl)-2-isopropyl-5-((methyl-d ₃)amino)pentanenitrile, hydrochloride (1:1)
TLC Catalogue Number:	V-0443
CAS Number:	N/A
Alternate CAS Number:	67775-97-7 (non-labelled)
Molecular Weight:	293.43 36.46
Molecular Formula:	C ₁₇ H ₂₃ D ₃ N ₂ O ₂ · HCl
Source:	TLC Pharmaceutical Standards
Source Lot No.:	7495-026A1
Storage Conditions:	Store at 2-8 °C
Solubility:	Methanol, DMSO, DMF, Acetonitrile



Test Description	Specifications	Results
Visual Description	Off-white solid	Conforms
Identification IR MS ¹ H NMR	Conforms to structure Conforms to structure Conforms to structure	Conforms Conforms Conforms
Purity (HPLC)	Not less than 95.0%	98.8%
Impurity (HPLC)	RT 1.62, 0.55%; RT 16.05, 0.12%; RT 16.27, 0.25%	
Isotopic Enrichment	Not less than 98.0%	99.8%
Water Content (KF)	N/A	0.2%
Residual Solvents (NMR)	0.1% ethyl acetate	
Assay (%)	Not less than 90.0%	98.5%
Recommendation:	Release.	

Name	Department	Signature	Date
Reviewed and approved by:	Quality Control		06/18/2026
Approved by:	Quality Assurance		06/18/2026

Attachments: Peak Attribution Table, Assay Calculation, HPLC, IR, MS and NMR spectra.