

## CERTIFICATE OF ANALYSIS

PRODUCT : DILTIAZEM HCl (MICRONISED)		COMPENDIA : Ph.Eur.-7.7	
BATCH NO. : DIL/M-16013		QUANTITY : 500 Kg	
MFG. DATE : SEPTEMBER.2013		EXP. DATE : AUGUST.2018	
QC A.R. No.: FP/194/2013			
TESTS		RESULTS	SPECIFICATIONS
01. CHARACTERS			

<b>01. CHARACTERS</b>		
i. Appearance	A white, crystalline powder.	White or almost white, crystalline powder.
ii. Solubility	Freely soluble in water, in methanol and in methylene chloride, slightly soluble in anhydrous ethanol.	Freely soluble in water, in methanol and in methylene chloride, slightly soluble in anhydrous ethanol.
iii. Melting point	Melted at 213°C with decomposition.	Melts at about 213° C with decomposition.
<b>02. IDENTIFICATION.</b>		
IR Absorption	Concordant with working standard	IR Absorption spectrum of the sample is concordant with that of the Diltiazem hydrochloride CRS / working standard. It gives reaction to chlorides. Clear and colourless.
CHLORIDES	Positive	
<b>03. APPEARANCE OF SOLUTION</b>	Clear and colorless	
<b>04. pH</b>	4.9	4.3 to 5.3
<b>05. SPECIFIC OPTICAL ROTATION</b>	+117°	+ 115° to + 120°
<b>06. RELATED SUBSTANCES</b>		
i. Impurity F	Not Quantified	Not more than 0.3% w/w
ii. Unspecified Impurities	Not Quantified	Not more than 0.10% w/w each
iii. Total Impurities	Not Quantified	Not more than 0.30% w/w
<b>07. HEAVY METALS</b>	Less than 10 ppm	Not more than 10 ppm
<b>08. LOSS ON DRYING</b>	0.16%	Not more than 0.50% w/w
<b>09. SULPHATED ASH</b>	0.04%	Not more than 0.10% w/w
<b>10. ASSAY (By Titration)</b>	99.63%	Not less than 98.50% w/w and Not more than 101.00% w/w
<b>(On dried basis)</b>		
<b>ADDITIONAL TEST:</b>		
<b>PARTICLE SIZE</b>		
100%	73 Microns	100% Less than 100 Microns
<b>Surface Area</b>	1.56 m <sup>2</sup> /gm	For Information
<b>RESIDUAL SOLVENTS ( BY GC-HS)</b>		
Toluene	245 ppm	Not more than 750 ppm
Methanol	109 ppm	Not more than 500 ppm
Isopropyl Alcohol	Not detected	Not more than 1000 ppm
Ethyl Acetate	2 ppm	Not more than 2500 ppm
<b>Bulk Density</b>	0.28 g/ml	For Information
<b>Tapped Density</b>	0.50 g/ml	For Information

**REMARKS:** The product conforms to Ph.Eur.-7.7 & Customer's Specifications

Prepared by  
Executive-QC

Checked by  
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Approved by  
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### CERTIFICATE OF ANALYSIS

<b>PRODUCT</b> : DILTIAZEM HCl (Micronised)	<b>COMPENDIA</b> : JP XVI
<b>BATCH NO.</b> : DIL/M-16013	<b>QUANTITY</b> : 500 Kg
<b>MFG. DATE</b> : SEPTEMBER.2013	<b>EXP. DATE</b> : AUGUST.2018
<b>QC A.R.No.:</b> FP/194/2013	

TESTS	RESULTS	SPECIFICATIONS
01. DESCRIPTION	White crystalline powder. It is very soluble in formic acid, freely soluble in water, in methanol and in chloroform, sparingly soluble in acetonitrile, slightly soluble in acetic anhydride and in ethanol (99.5%) and practically insoluble in diethyl ether.	White crystals or crystalline powder. It is very soluble in formic acid, freely soluble in water, in methanol and in chloroform, sparingly soluble in acetonitrile, slightly soluble in acetic anhydride and in ethanol (99.5%), and practically insoluble in diethyl ether.
02. IDENTIFICATION		
1. Reaction with Ammonium thiocyanate cobaltous nitrate	Conforms	To comply as per JP
2. Reaction of sulphates	Conforms	
3. UV	Conforms	To comply as per JP
4. IR Spectrum	Conforms	UV spectrum of sample and standard should exhibit similar intensities of absorption at the same wavelengths. The IR of the test sample exhibits absorption at the wave numbers of about 1741 cm <sup>-1</sup> , 1678 cm <sup>-1</sup> , 1252 cm <sup>-1</sup> , and 1025 cm <sup>-1</sup> . To comply as per JP
5. Reaction of chloride	Positive	Between +115° and +120°
03. OPTICAL ROTATION	+ 117°	210° to 215° C (with Decomposition)
04. MELTING POINT	213° C (with decomposition)	Between 4.3 to 5.3
05. pH	4.9	The solution is clear and colourless.
06. CLARITY AND COLOUR OF SOLUTION	Clear and colorless	
07. SULFATES	Less than 0.024%	Not more than 0.024%
08. HEAVY METALS	Less than 10 ppm	Not more than 10 ppm
09. ARSENIC	Less than 2 ppm	Not more than 2 ppm
10. RELATED SUBSTANCES (By HPLC)		
Total impurities	0.0%	Not more than 0.3%
11. LOSS ON DRYING	0.2%	Not more than 0.5% w/w
12. RESIDUE ON IGNITION	0.0%	Not more than 0.1% w/w
13. ASSAY (On dry basis)	99.9%	Not less than 98.5% w/w
<b>ADDITIONAL TESTS:</b>		
<b>PARTICLE SIZE</b>		
100%	73 Microns	100% Less than 100 Microns
<b>Surface Area</b>	1.56 m <sup>2</sup> /gm	For Information
<b>RESIDUAL SOLVENTS</b>		
Toluene	245 ppm	Not more than 750 ppm
Methanol	109 ppm	Not more than 500 ppm
Isopropyl Alcohol	Not detected	Not more than 1000 ppm
Ethyl Acetate	2 ppm	Not more than 2500 ppm
<b>Bulk Density</b>	0.28 g/ml	For Information
<b>Tapped Density</b>	0.50 g/ml	For Information

**REMARKS:** The product conforms to JP XVI & Customer's Specifications.

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