



**Gojira Fine Chemicals, LLC**  
Quality Products & Services Meeting Customer Needs  
5386 Majestic Parkway, Suite 7, Bedford Heights, OH 44146  
[www.gojiraafc.com](http://www.gojiraafc.com) • [sales@gojiraafc.com](mailto:sales@gojiraafc.com)

## Certificate of Analysis

### Putrescine Dihydrochloride

**Catalog Number:** PU1001  
**Lot Number:** 0914602  
**CAS Number:** 333-93-7  
**Synonym(s):** 1,4-Butanediamine dihydrochloride, 1,4-Butanediammonium dichloride  
**Molecular Formula:**  $C_4H_{12}N_2 \cdot 2HCl$   
**Molecular Weight:** 161.08  
**Storage:** 2°C – 8°C  
**Retest Date:** February 10, 2019

Test	Specification	Result
Appearance	White crystalline powder	Conforms
Assay	$\geq 99\%$	99.26%
Moisture (LOD)	$\leq 0.5\%$	0.19%
Residue on Ignition	$\leq 0.2\%$	0.11%
Sulfate	$\leq 0.02\%$	$< 0.02\%$
Iron	$\leq 0.002\%$	$< 0.002\%$
Heavy Metals	$\leq 20\text{ppm}$	$< 20\text{ppm}$
Total Plate Count	$\leq 1,000\text{cfu/g}$	$< 1,000\text{cfu/g}$
<i>E. coli</i>	Negative	Negative
<i>Salmonella</i>	Negative	Negative

Approved by:

John Grubb, PhD  
Gojira Fine Chemicals, LLC  
Quality Manager  
Tel: 440-539-7033 Fax: 888-211-5523  
[john@gojiraafc.com](mailto:john@gojiraafc.com)

Date: September 15, 2016