

ANSI/I3A IT4.104-2002

# American National Standard

*for Photography –  
Processing Chemicals –  
Specifications for Hydrochloric Acid*

---



This is a preview of "ANSI/I3A IT4.104-200...". [Click here to purchase the full version from the ANSI store.](#)

**ANSI/I3A IT4.104-2002**  
Revision and redesignation of  
ANSI/NAPM IT4.104-1980 (R1995)

American National Standard  
for Photography –  
Processing Chemicals –  
Specifications for Hydrochloric Acid

Secretariat  
**International Imaging Industry Association, Inc. (I3A)**

Approved May 21, 2002  
**American National Standards Institute, Inc.**

## American National Standard

Approval of an American National Standard requires review by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgement of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made towards their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

**CAUTION NOTICE:** This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

Published by

**American National Standards Institute, Inc.  
25 West 43rd Street, New York, NY 10036**

Copyright © 2002 by American National Standards Institute, Inc.  
All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without prior written permission of the publisher.

Printed in the United States of America

## Contents

	Page
Foreword .....	ii
<b>0</b> Introduction .....	iii
<b>1</b> Scope .....	1
<b>2</b> Normative references .....	1
<b>3</b> General .....	1
<b>4</b> Requirements .....	2
<b>5</b> Reagents and glassware .....	2
<b>6</b> Sampling .....	2
<b>7</b> Test methods .....	2
<b>Table</b>	
<b>1</b> Summary of requirements .....	2

**Foreword** (This foreword is not part of American National Standard ANSI/I3A IT4.104-2002.)

This standard is one of a series of standards establishing criteria of purity for chemicals used in processing photographic materials. In the current review process, this series of standards is being updated and revised in format. Many of the standards in this series, but not all, also exist as standards of the International Organization for Standardization (ISO). The current updates and revisions are in accord with that done for the ISO standards. In an effort to promote the concept of international standardization, references to ISO standards have been left in place.

Suggestions for the improvement of this standard will be welcome. They should be sent to the International Imaging Industry Association, Inc. (I3A), 550 Mamaroneck Avenue, Suite 307, Harrison, NY 10528-1615, e-mail: [i3astds@i3a.org](mailto:i3astds@i3a.org).

This standard was processed and approved for submittal to ANSI by I3A Technical Committee IT4 on Photographic Processing. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this edition of the standard, the IT4 Committee had the following members:

Joseph M Rao, Chairman  
John Gignac, Secretary

<i>Organization Represented</i>	<i>Name of Representative</i>
International Imaging Industry Association, Inc. (I3A) .....	Jan Carlock Linda Crosby Kunihiro Fujiwara Ronald A. Klein Laszlo Papai Anthony Jarkowsky
General Chemical Corporation .....	Mark Dulik
Photographic Society of America, Inc. ....	Grant Haist
Photo Marketing Association International .....	Herb Stein

*Individual Experts*

Peter Krause  
Norman Newman  
Joseph M. Rao

Subcommittee IT4-1 on Specifications for Photographic Chemicals, which was responsible for this edition, had the following members:

Joseph M. Rao, Chairman-protém	Jan Carlock Linda Crosby Mark Dulik Kunihiro Fujiwara Norman Newman Laszlo Papai Herb Stein
--------------------------------	---

## 0 Introduction

**0.1** This standard is one of a series that establishes criteria of purity for chemicals used in processing photographic materials. General test methods and procedures cited in this standard are compiled in Parts 1, 4, and 5 of ISO 10349.

This standard is intended for use by individuals with a working knowledge of analytical techniques, which may not always be the case. Some of the procedures utilize caustic, toxic, or otherwise hazardous chemicals. Safe laboratory practice for the handling of chemicals requires the use of safety glasses or goggles and other protective apparel such as rubber gloves, face masks or aprons where appropriate.

Normal precautions required in the performance of any chemical procedure shall be exercised at all times, but care has been taken in this standard to provide warnings for hazardous materials. Hazard warnings designated by a letter enclosed in angle brackets, < >, are used as a reminder in those steps detailing handling operations and are defined in ISO 10349-1. More detailed information regarding hazards, handling, and use of these chemicals may be available from the manufacturer.

**0.2** This standard provides chemical and physical requirements for the suitability of a photographic-grade chemical. The tests correlate with undesirable photographic effects. Purity requirements are set as low as possible consistent with these photographic effects. These criteria are considered the minimum requirements necessary to assure sufficient purity for use in photographic processing solutions, except that if the purity of a commonly available grade of chemical exceeds photographic processing requirements and if there is no economic penalty in its use, the purity requirements have been set to take advantage of the availability of the higher quality material.

Every effort has been made to keep the number of requirements to a minimum. Inert impurities are limited to amounts that will not unduly reduce the assay. All tests are performed on samples "as received" to reflect the condition of materials furnished for use. Although the ultimate criterion for suitability of such a chemical is its successful performance in an appropriate use test, the shorter, more economical test methods described in this standard are generally adequate.

Assay procedures have been included in all cases where a satisfactory method is available. An effective assay requirement serves not only as a safeguard of chemical purity, but also as a valuable complement to the identity test. Identity tests have been included whenever a possibility exists that another chemical or mixture of chemicals could pass the other tests.

All requirements listed in clause 4 are mandatory. The physical appearance of the material and any footnotes are for general information only and are not part of the requirements.

**0.3** Efforts have been made to employ tests that are capable of being run in any normally equipped laboratory and, wherever possible, to avoid tests that require highly specialized equipment or techniques. Instrumental methods have been specified only as alternative methods or alone in those cases where no other satisfactory method is available.

Over the past few years, great improvements have been made in instrumentation for various analyses. Where such techniques have equivalent or greater precision, they may be used in place of the tests described in this standard. Correlation of such alternative procedures with the given method is the responsibility of the user. In case of disagreement in results, the method called for in the specification shall prevail. Where a requirement states "to pass test", however, alternative methods shall not be used.

This is a preview of "ANSI/I3A IT4.104-200...". [Click here to purchase the full version from the ANSI store.](#)



American National Standard  
for Photography –

# Processing Chemicals – Specifications for Hydrochloric Acid

## 1 Scope

This standard establishes criteria for the purity of photographic-grade hydrochloric acid (DANGER:<<B>>, <<C>>)<sup>1)</sup> and specifies the tests to be used to determine the purity.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid standards.

ISO 10349-1:1992, *Photography – Photographic-grade chemicals – Test methods – Part 1: General*

ISO 10349-4:1992 (R1999), *Photography – Photographic-grade chemicals – Test methods – Part 4: Determination of residue after ignition*

ISO 10349-5:1992 (R1999), *Photography – Photographic-grade chemicals – Test methods – Part 5: Determination of heavy metals and iron content*

## 3 General

### 3.1 Physical properties

Hydrochloric acid, HCl, is a solution of hydrogen chloride gas in water. It is a colorless or slightly yellow liquid with an extremely pungent odor.

Anhydrous hydrochloric acid (hydrogen chloride) has a relative molecular mass of 36.46.

### 3.2 Hazardous properties

Hydrochloric acid causes severe skin burns on contact.

### 3.3 Storage

Hydrochloric acid shall be stored in well-closed containers away from combustible materials.

<sup>1)</sup> Hazard warning codes are defined in ISO 10349-1, clause 4.