

ANSI/PIMA IT4.41-1999

American National Standard

*for Photography (Processing) –
Effluents –
Determination of Free Cyanide*



American National Standards Institute

11 West 42nd Street
New York, New York
10036

ANSI/PIMA IT4.41-1999

Revision and redesignation of
ANSI/ISO 6703/4-1985,
ANSI PH4.41-1990

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for Photography (Processing) –

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Determination of Free Cyanide

Secretariat

Photographic & Imaging Manufacturers Association, Inc.

Approved July 21, 1999

American National Standards Institute, Inc.

American National Standard

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Contents

	Page
Foreword	ii
Introduction	iv
1 Scope	1
2 Normative references	1
3 Definitions	2
4 Principle	2
5 Safety and operational precautions	2
6 Materials and reagents	3
7 Apparatus	5
8 Sampling and sample preparation	6
9 Procedure	8
10 Expression of results	10
11 Test report	10
Table	
1 Determination of known amounts of cyanide	7
Figure	
1 Microdiffusion cell	11
Annex	
A Bibliography	12

Foreword (This foreword is not part of American National Standard ANSI/PIMA IT4.41-1999.)

This American National Standard is one of a series devoted to the analysis of photographic processing effluents. It represents a revision and redesignation of ANSI/ISO 6703/4-1985, ANSI PH4.41-1990. Major modifications include:

- Incorporation of the hazard warning system used in other IT4 standards;
- Expansion of text in clause 6 (materials and reagents) and clause 8 (sampling and sample preparation);
- Refrigeration, keeping times, and frequency of standardization have been changed for some of the solutions;
- The time for absorbance measurement after addition of the pyridine-barbituric acid solution has been changed from 15 minutes to 3 minutes;
- Addition of some normative references and a bibliography;
- Use of a decimal point as the radix.

This standard is technically equivalent to ISO 6703-4:1985, *Water quality - Determination of cyanide - Part 4: Determination of cyanide by diffusion at pH 6*.

This standard contains one annex, which is for information only and is not considered part of this standard.

Suggestions for improvements of this standard will be welcome. They should be sent to the Photographic & Imaging Manufacturers Association, Inc., 550 Mamaroneck Avenue, Suite 307, Harrison, NY 10528-1612, e-mail: natlstds@pima.net.

This standard was processed and approved for submittal to ANSI by PIMA 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 standard, the IT4 Committee had the following members:

Joseph M. Rao, Chairman
John Gignac, Secretary

<i>Organization Represented</i>	<i>Name of Representative</i>
Photographic & Imaging Manufacturers Association, Inc. (PIMA)	Jan Carlock Angela D'Agostaro Ronald A. Klein Peter Krause Pasquini, David Joseph M. Rao Anthony Jarkowski (Alt.) Edward E. Schiller Kenneth M. Smith
General Chemical Corporation	Mark Dulik
Photographic Society of America, Inc.	Grant Haist
Professional Photographers of America, Inc.	Tim Mathiesen
Society for Imaging Science and Technology	William R. Towns
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Norman Newman	

Subcommittee IT4-5 on Photographic Effluents, which developed this standard, had the following members:

Kenneth M. Smith, Chairman

Angela D'Agostaro
Mark Dulik
Anthony Jarkowski
Peter Krause
Norman Newman
Joseph M. Rao
Edward Schiller

Introduction

This standard is one of a series devoted to the analysis of photographic processing wastes. It encompasses the determination of free cyanide, as defined in 3.1, in photographic effluents. Cyanides may be present in water as hydrocyanic acid (prussic acid), cyanide ions, and complex cyanides. These parameters may be determined as:

- total cyanides (ANSI/PIMA IT4.43);
- easily liberatable cyanide (ISO 6703-2) as defined in 3.2;
- hexacyanoferrates (ANSI/PIMA IT4.38, ISO 7766-1);
- chlorinated cyanides, which produce cyanogen chloride (CNCL) (ISO 6703-3).

The method specified in this standard will determine smaller amounts of cyanide than the above-cited standard methods. However, it will not give quantitative results in the presence of large amounts of copper or nickel.

American National Standard for Photography (Processing) –

Effluents – Determination of Free Cyanide

1 Scope

This standard specifies a method for the determination of free cyanide at pH 6 in photographic effluents and wastewaters.

The method is applicable to water containing from 10 µg to 150 µg of free cyanide per liter, but higher concentrations may be determined by suitable dilution of the sample. The response is linear over the indicated range. For possible interferences, see clause 4.

NOTE - The test procedure in this standard is sophisticated and calls for care in sample storage and manipulation of the samples and equipment. The method requires practice and manual dexterity.

It is not the purpose of this standard to specify the measurement of the amount of potentially available cyanide, but rather the amount being already present and determinable by this method (see clause 3).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National 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 International Standards.

ANSI/NAPM IT4.99-1996, *Photography - Photographic-grade chemicals - Test methods (Part 1: General)*¹⁾

ANSI/PIMA IT4.43-1998, *Photography (Processing) - Effluents - Determination of total cyanide*¹⁾

ANSI/ISO 7766-1: 1993, ANSI/PIMA IT4.38-1998, *Photography (Processing) - Effluents - Analysis of cyanides - Part 1: Determination of hexacyanoferrate (II) and hexacyanoferrate (III) by spectrometry*¹⁾

ISO 5667-1:1980, *Water quality - Sampling - Part 1: Guidance on the design of sampling programs*¹⁾

ISO 5667-2:1991, *Water quality - Sampling - Part 2: Guidance on sampling techniques*¹⁾

ISO 5667-3:1994, *Water quality - Sampling - Part 3: Guidance on the preservation and handling of samples*¹⁾

ISO 6353-1:1982, *Reagents for chemical analysis - Part 1: General requirements*¹⁾

ISO 6353-2:1983, *Reagents for chemical analysis - Part 2: Specifications - First series*¹⁾

ISO 6353-3:1987, *Reagents for chemical analysis - Part 3: Specifications - Second series*¹⁾

ISO 6703-2:1984, *Water quality - Determination of cyanide - Part 2: Determination of easily liberatable cyanide*¹⁾

ISO 6703-3:1985, *Water quality - Determination of cyanide - Part 3: Determination of cyanogen chloride*¹⁾

¹⁾ For electronic copies of some standards, visit ANSI's Electronic Standards Store (ESS) at www.ansi.org. For printed versions of all these standards, contact Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5704, (800) 854-7179.