NFPA 434
Code for the Storage of Pesticides

2002 Edition

NFPA, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

NFPA License Agreement

This document is copyrighted by the National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101 USA.
All rights reserved.

NFPA grants you a license as follows: The right to download an electronic file of this NFPA document for temporary storage on one computer for purposes of viewing and/or printing one copy of the NFPA document for individual use. Neither the electronic file nor the hard copy print may be reproduced in any way. In addition, the electronic file may not be distributed elsewhere over computer networks or otherwise. The hard copy print may only be used personally or distributed to other employees for their internal use within your organization.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS

Not for Resale

Copyright ©
National Fire Protection Association, Inc.
One Batterymarch Park
Quincy, Massachusetts 02269

IMPORTANT NOTICE ABOUT THIS DOCUMENT

NFPA codes, standards, recommended practices, and guides, of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in its codes and standards.

The NFPA disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making this document available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of this document. Nor does the NFPA list, certify, test or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.

NOTICES

All questions or other communications relating to this document and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA documents during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

Users of this document should be aware that this document may be amended from time to time through the issuance of Tentative Interim Amendments, and that an official NFPA document at any point in time consists of the current edition of the document together with any Tentative Interim Amendments then in effect. In order to determine whether this document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments, consult appropriate NFPA publications such as the *National Fire Codes*® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the NFPA at the address listed above.

A statement, written or oral, that is not processed in accordance with Section 5 of the Regulations Governing Committee Projects shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

The NFPA does not take any position with respect to the validity of any patent rights asserted in connection with any items which are mentioned in or are the subject of this document, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on this document. Users of this document are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Users of this document should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of this document, intend to urge action that is not in compliance with applicable laws, and this document may not be construed as doing so.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Licensing Policy

This document is copyrighted by the National Fire Protection Association (NFPA). By making this document available for use and adoption by public authorities and others, the NFPA does not waive any rights in copyright to this document.

1. Adoption by Reference—Public authorities and others are urged to reference this document in laws, ordinances, regulations, administrative orders, or similar instruments. Any deletions, additions, and changes desired by the adopting authority must be noted separately. Those using this method are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. The term "adoption by reference" means the citing of title and publishing information only.

2. Adoption by Transcription—A. Public authorities with lawmaking or rule-making powers only, upon written notice to the NFPA (Attention: Secretary, Standards Council), will be granted a royalty-free license to print and republish this document in whole or in part, with changes and additions, if any, noted separately, in laws, ordinances, regulations, administrative orders, or similar instruments having the force of law, provided that: (1) due notice of NFPA's copyright is contained in each law and in each copy thereof; and (2) that such printing and republication is limited to numbers sufficient to satisfy the jurisdiction's lawmaking or rule-making process. **B.** Once this NFPA Code or Standard has been adopted into law, all printings of this document by public authorities with lawmaking or rule-making powers or any other persons desiring to reproduce this document or its contents as adopted by the jurisdiction in whole or in part, in any form, upon written request to NFPA (Attention: Secretary, Standards Council), will be granted a nonexclusive license to print, republish, and vend this document in whole or in part, with changes and additions, if any, noted separately, provided that due notice of NFPA's copyright is contained in each copy. Such license shall be granted only upon agreement to pay NFPA a royalty. This royalty is required to provide funds for the research and development necessary to continue the work of NFPA and its volunteers in continually updating and revising NFPA standards. Under certain circumstances, public authorities with lawmaking or rule-making powers may apply for and may receive a special royalty where the public interest will be served thereby.

3. Scope of License Grant—The terms and conditions set forth above do not extend to the index of this document.

(For further explanation, see the Policy Concerning the Adoption, Printing, and Publication of NFPA Documents, which is available upon request from the NFPA.)

--`,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS

Not for Resale

Copyright © 2002, National Fire Protection Association, All Rights Reserved

NFPA 434

Code for the

Storage of Pesticides

2002 Edition

This edition of NFPA 434, *Code for the Storage of Pesticides*, was prepared by the Technical Committee on Hazardous Chemicals and acted on by NFPA at its May Association Technical Meeting held May 19–23, 2002, in Minneapolis, MN. It was issued by the Standards Council on July 19, 2002, with an effective date of August 8, 2002, and supersedes all previous editions.

This edition of NFPA 434 was approved as an American National Standard on July 19, 2002.

Origin and Development of NFPA 434

At the 1974 NFPA Annual Meeting, the Sectional Committee on Storage, Handling, and Transportation of Hazardous Chemicals obtained tentative adoption of this code. As a tentative NFPA document, it was circulated for review and comment. Based on the comments received, the tentative code was revised and preprinted in the 1975 NFPA Fall Meeting Technical Committee Report and was again subject to public review and comment. The comments received were considered by the Sectional Committee, and their actions were published in the 1975 NFPA Fall Meeting Technical Committee Documentation.

The first edition of NFPA 43D was officially adopted by the Association at its 1975 Fall Meeting in Pittsburgh, PA, on November 19, 1975. It contained those requirements that the Sectional Committee believed to be essential for the safe storage of pesticides in portable containers. It was processed in accordance with the NFPA Regulations Governing Technical Committees.

Minor amendments were adopted at the 1980 NFPA Fall Meeting and at the 1984 NFPA Fall Meeting.

The 1994 edition of NFPA 43D was a complete revision; the title of the code was changed from *Code for the Storage of Pesticides in Portable Containers* to *Code for the Storage of Pesticides*. The document was completely revised to update the requirements for safe handling, fire prevention, and storage provisions for restricted-use pesticides. Restricted-use pesticides are those pesticides that are required by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) to bear the human signal word "Danger" or those pesticides that, when evaluated by NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, are determined to have health hazard ratings of "3" or "4."

The NFPA Committee on Hazardous Chemicals completely revised the 1994 edition to make it compatible with industry practices and other industry standards and to incorporate regulatory provisions that have changed since the previous edition of the code.

The 1998 edition included a change to the numbering of the document from NFPA 43D to NFPA 434. It also added a new Annex B, which is a listing of typical pesticides.

The 2002 edition has been changed to NFPA's *Manual of Style* requirements. The most significant part of this change has been the reordering of chapters.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Technical Committee on Hazardous Chemicals

John A. Davenport, *Chair*
West Hartford, CT [I]
Rep. Industrial Risk Insurers

Anthony Andrews, Crompton Corporation, TX [M]
Rep. Society of the Plastics Industry, Inc.
James E. Benge, Hercules Inc., DE [U]
William J. Bradford, Brookfield, CT [SE]
David S. Carlson, Akzo Nobel Polymer Chemicals LLC, TX [M]
Henry L. Febo, Jr., FM Global, MA [I]
Richard Ferguson, PPG Industries, Inc., PA [M]
Charles L. Gibson, Gibson Technology & Engineering Associates, GA [SE]
H. Dieter Heinz, Heinz Laboratories International, CA [SE]
Donald J. Hoffmann, Safety Engineering Laboratories, Inc., MI [SE]
Ronald Keefer, Menlo Park Fire Protection District, CA [E]
Alan R. Laguna, Merit Sprinkler Company, Inc., LA [IM]
Chester M. McCloskey, The Norac Company, Inc., CA [M]
Robert A. Michaels, RAM TRAC Corporation, NY [SE]
Ralph J. Mikida, FMC Corporation, PA [M]
Milton Norsworthy, Arch Chemicals, Inc., TN [M]
David P. Nugent, Schirmer Engineering Corporation, IL [SE]
Anthony M. Ordile, Loss Control Associates, Inc., PA [SE]
David F. Purdy, BioLab, Inc., GA [M]
George W. Rambo, GRCS Inc., VA [SE]
Gary F. Trojak, Chlorine Institute Inc., DC [M]
(Vote Ltd. to NFPA 434)
Samuel Vanover, Jefferson Parish Fire Department, LA [E]
Michael A. Viggiani, George Eastman House, NY [U]

Alternates

Paul A. Cera, Industrial Risk Insurers, CT [I]
(Alt. to J. A. Davenport)
Richard Cobb, The Norac Company, Inc., CA [M]
(Alt. to C. M. McCloskey)
Lynne R. Harris, Society of the Plastics Industry, Inc., DC [M]
(Alt. to A. Andrews)
John M. Hoffmann, Safety Engineering Laboratories, Inc., MI [SE]
(Alt. to D. J. Hoffmann)
Thomas M. Lachocki, BioLab, Inc., GA [M]
(Alt. to D. F. Purdy)

Nonvoting

Charles H. Ke, U.S. Department of Transportation, DC

Carl H. Rivkin, NFPA Staff Liaison

Committee Scope: This Committee shall have primary responsibility for documents on, and maintain current codes for, classes of hazardous chemicals and codes for specific chemicals where these are warranted by virtue of widespread distribution or special hazards.

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Contents

Chapter 1 Administration **434–** 4
1.1 Scope **434–** 4
1.2 Purpose **434–** 4
1.3 Application **434–** 4
1.4 Equivalency **434–** 4
1.5 Enforcement **434–** 4

Chapter 2 Referenced Publications **434–** 4
2.1 General **434–** 4
2.2 NFPA Publications **434–** 4
2.3 Other Publications **434–** 4

Chapter 3 Definitions **434–** 5
3.1 General **434–** 5
3.2 NFPA Official Definitions **434–** 5
3.3 General Definitions **434–** 5

Chapter 4 General Requirements **434–** 5
4.1 Hazard Management **434–** 5
4.2 Structures and Buildings **434–** 6
4.3 Control of Ignition Sources **434–** 6
4.4 Fire Protection **434–** 6
4.5 Loading and Unloading Facilities **434–** 6
4.6 Hazard Identification **434–** 6
4.7 Training **434–** 6

Chapter 5 Storage **434–** 7
5.1 Separation Requirements **434–** 7
5.2 Segregation of Incompatible Materials **434–** 7
5.3 Pesticide Storage Location **434–** 7
5.4 Storage Conditions **434–** 7
5.5 Storage Arrangements **434–** 7

Annex A Explanatory Material **434–** 7

Annex B Typical Pesticides **434–** 8

Annex C Supplementary Information on Emergency Response Plans **434–**10

Annex D Restricted-Use Pesticides **434–**11

Annex E Sample Ordinance Adopting NFPA 434 ..... **434–**12

Annex F Informational References **434–**12

Index **434–**13

--`,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

NFPA 434

Code for the

Storage of Pesticides

2002 Edition

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet between the paragraphs that remain.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, Annex F lists the complete title and edition of the source documents for both mandatory and nonmandatory extracts. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the appropriate technical committee.

Information on referenced publications can be found in Chapter 2 and Annex F.

Chapter 1 Administration

1.1 Scope.

1.1.1 This code shall apply to both inside and outside storage of pesticides as described in this code.

1.1.2* This code shall apply to restricted use pesticides, which are required by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) in 40 CFR 152.175, to bear the human signal word "Danger" [as defined in 40 CFR 156.10(i)(A)] or those restricted-use pesticides, which when evaluated against NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response* (Health Hazard Warning Determination), are determined to be rated as "3" or "4."

1.1.3 This code shall not apply to sanitizers and disinfectants covered by other codes.

1.1.4 This code shall not apply where storage at a site is equal to or less than 1000 gal (3790 L) or 10,000 lb (4540 kg). This code shall not apply where pesticide storage time in a calendar year is 14 days or less.

Exception No. 1: Hazard identification as specified in Section 4.6 shall apply to all pesticide storage facilities.

Exception No. 2: This code shall apply to tank trucks, rail cars, or any other transportation vehicle involved in the temporary pesticide storage. (See 4.2.2.3.)

1.1.5 Existing buildings storing pesticides that do not comply with the requirements of this code pertaining to noncombustible construction and fixed fire protection shall be permitted to be used at the discretion of the authority having jurisdiction, provided their use does not constitute a distinct hazard to life or adjoining property.

1.2 Purpose. The purpose of this code is to provide for the safe storage of pesticides and the safe mitigation of releases of these materials where involved in fire and nonfire incidents.

1.3 Application. The requirements of NFPA 30, *Flammable and Combustible Liquids Code;* NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products;* NFPA 430, *Code for the Storage of Liquid and Solid Oxidizers;* NFPA 230, *Standard for the Fire Protection of Storage;* and NFPA 490, *Code for the Storage of Ammonium Nitrate,* shall apply where applicable and where they are more restrictive than this code.

1.3.1 Pesticides covered in this code that are stored in the same facility with oxidizers shall be stored in accordance with NFPA 430, *Code for the Storage of Liquid and Solid Oxidizers.*

1.3.2 Pesticides stored in the same facility with ammonium nitrate fertilizer shall be stored in accordance with NFPA 490, *Code for the Storage of Ammonium Nitrate.*

1.4 Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices equivalent to those prescribed by this code, provided that technical documentation is submitted to the authority having jurisdiction that demonstrates equivalency, and provided that the system, method, or device is approved for the intended purpose.

1.5 Enforcement. This code shall be administered and enforced by the authority having jurisdiction designated by the governing authority. *(See Annex E for sample wording for enabling legislation.)*

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this code and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 30, *Flammable and Combustible Liquids Code,* 2000 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products,* 1998 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work,* 1999 edition.

NFPA 70, *National Electrical Code®,* 2002 edition.

NFPA 230, *Standard for the Fire Protection of Storage,* 1999 edition.

NFPA 430, *Code for the Storage of Liquid and Solid Oxidizers,* 2000 edition.

NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents,* 2002 edition.

NFPA 490, *Code for the Storage of Ammonium Nitrate,* 1998 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response,* 2001 edition.

2.3 Other Publications.

2.3.1 U.S. Government Publications. U.S. Government Printing Office, Superintendent of Documents, Washington, DC 20402.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Title 29, *Code of Federal Regulations*, Part 1910.120 (OSHA), "Hazardous Waste Operations and Emergency Response."

Title 29, *Code of Federal Regulations*, Part 1910.1200 (OSHA), "Hazard Communication."

Title 40, *Code of Federal Regulations*, Parts 152.175 and 156.10(i)(A).

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this code. Where terms are not included, common usage of the terms shall apply.

3.2* NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

3.2.3* Code. A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

3.2.4 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.5* Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

3.2.6 Shall. Indicates a mandatory requirement.

3.2.7 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Basement. A story of a building or structure having one-half or more of its height below ground level and to which access for fire-fighting purposes is unduly restricted.

3.3.2 Commercial User. A person, such as a commercial grower, a certified applicator, a pest control operator, a fumigator, or a greenhouse operator, who stores pesticides in a storage building or storage area to which the public ordinarily does not have access.

3.3.3 Container. Any bag, bottle, carton, can, pressurized container, drum, portable tank, or other closed vessel containing a pesticide.

3.3.3.1 Closed Container. A container as herein defined, so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures. [**30A:**3.1]

3.3.4 Material Safety Data Sheet (MSDS). The document that describes composition of a material, hazardous properties and hazard mitigation, and disposal information prepared in accordance with the Occupational Safety and Health Administration (OSHA) hazard communication standard (29 CFR 1910.1200, "Hazard Communication").

3.3.5 Person. Any individual, firm, copartnership, corporation, company, association, or joint-stock association, including any trustee, receiver, assignee, or personal representative thereof. [**1124:**1.4]

3.3.6 Pest. Any unwanted plant, animal, or microorganism, including insects, rodents, nematodes, fungi, weeds, bacteria, or virus.

3.3.7 Pesticide. Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest or for use as a plant regulator, defoliant, or desiccant.

3.3.7.1 Restricted-Use Pesticide. Pesticides classified for restricted use under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) in 40 CFR 152.175. These pesticides shall be permitted to be purchased and applied by applicators who are certified and licensed in accordance with the U.S. Environmental Protection Agency (EPA) regulations.

3.3.8 Secondary Containment. Any device or structure that prevents environmental contamination when the primary container or its appurtenances fail. Secondary containment shall be designed and constructed to intercept and contain pesticide spills and leaks and to prevent runoff or leaching of pesticides into the environment. Examples of secondary containment include dikes, curbing, and double-walled tanks.

3.3.9 Warehouse. Any building, structure, or portion thereof used for storage of pesticides.

Chapter 4 General Requirements

4.1 Hazard Management.

4.1.1 No person shall construct or significantly modify a pesticide storage facility unless the construction plans are reviewed and approved by the authority having jurisdiction.

4.1.2* No person shall store materials covered by this code until a hazardous materials management response plan and an emergency response plan have been completed and approved by the authority having jurisdiction. *(See Annex C.)*

4.1.2.1 An emergency response coordinator shall be designated on the emergency response plan. The coordinator shall be responsible for implementing the emergency response plan and coordinating with outside agencies.

4.1.2.2 Equipment and materials necessary for implementing the emergency response plan shall be available and accessible.

4.1.2.3 The authority having jurisdiction shall be immediately notified whenever an unauthorized release of a pesticide in quantities that are reportable under federal, state, or local regulations occurs.

4.1.2.4 The facility responsible for an unauthorized release shall activate the emergency response plan.

4.1.2.5 The emergency response plan shall be reviewed when facilities are modified, or biennially, whichever is more frequent.

4.1.2.6 The hazardous materials management response plan shall be reviewed when facilities are modified, or biennially, whichever is more frequent.

--`,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

4.1.3 No person shall close or abandon any pesticide storage facility without notifying the authority having jurisdiction at least 30 days prior to the scheduled closing.

4.1.4 Housekeeping.

4.1.4.1 Accumulation of combustible waste materials in pesticide storage areas shall be prohibited.

4.1.4.2 Unsaleable Goods. A plan shall be written for the disposition of unsaleable goods, such as off-spec materials and goods in damaged packaging. The disposition of unsaleable goods shall be permitted to be in accordance with the manufacturer's recommendations and the pesticide label directions; the disposal shall be in accordance with local, state, and federal regulations; or the goods shall be returned to the manufacturer. Unsaleable goods shall be separated until disposition.

4.1.4.3 Disposition. Pesticide-contaminated materials shall be disposed of or decontaminated in accordance with appropriate federal, state, and local regulations as specified by the manufacturer's instructions.

4.1.4.4 Leakage of Containers. Leaking or damaged containers of pesticides shall be dealt with immediately by using overpacking, repackaging, or other approved methods. Overpacked material shall be segregated and stored until final disposition in accordance with the manufacturer's instructions.

4.1.4.5 Pallets. Contaminated pallets shall be disposed of with other pesticide-contaminated materials.

4.2 Structures and Buildings.

4.2.1 Buildings, or portions thereof, in which pesticides are stored shall be constructed of noncombustible materials.

Exception: Where protected by an approved automatic fire suppression system, combustible construction shall be permitted.

4.2.2 Floors. Floors shall be constructed and maintained to contain and control spillage and fire-fighting water.

4.2.2.1 Spill Control. Containment or drainage shall be provided to prevent the flow of pesticides during emergency conditions into adjoining building areas, property, or critical natural resources.

4.2.2.2 Drainage. Pesticide spills and fire-fighting water shall be either contained inside the facility or directed by a drainage system to outside, secondary containment. The capacity of the system shall be able to accommodate the following:

(1) The amount contained in the largest pesticide storage container

Exception: If pesticides are stored in a nonsprinklered building, provide containment for the maximum volume of stored liquids.

(2) Twenty minutes of fire-fighting water as specified in Section 4.4, if applicable

(3)*One-hundred-year rainfall during a 24-hour period, if outdoors

4.2.2.3 Temporary Storage. Tank trucks, rail cars, or any other transportation vehicle involved in temporary storage of pesticides at any one facility for three days or longer shall be provided with secondary containment.

4.2.3 Ventilation.

4.2.3.1 Indoor storage areas and buildings for the storage of pesticides shall be provided with emergency mechanical exhaust ventilation, which shall be manually actuated upon detecting a spill, leak, or release.

4.2.3.2 The ventilation system shall be designed to do the following:

(1)*It shall maintain the pesticide concentration below the accepted human exposure levels, or for a minimum of six air changes per hour, whichever method yields the higher number of air changes.

(2) The location of both the exhaust and inlet air openings shall be arranged to provide, as far as practicable, air movements across all portions of the floor to prevent accumulation of toxic or flammable vapors. Air shall be exhausted from the room directly to the exterior of the building without recirculation.

4.2.4 Electrical installations shall be in conformance with NFPA 70, *National Electrical Code®*.

4.2.5 Illumination. The pesticide storage area shall be illuminated as necessary to allow ready identification of pesticide container labeling.

4.3 Control of Ignition Sources.

4.3.1 Smoking shall be prohibited in all storage areas containing pesticides.

4.3.2 "No Smoking" signs shall be placed conspicuously within storage areas and at all entrances to storage areas.

4.3.3 Cutting or welding procedures shall be in conformance with NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work.*

4.4 Fire Protection. A risk assessment shall be performed by a competent individual to determine the extent and type of fire protection to be provided. The assessment shall consider materials stored, life safety considerations, containers, extinguishing media, storage methods, and environmental considerations. The results shall be submitted to the authority having jurisdiction for approval. *(See Annex D.)*

4.5 Loading and Unloading Facilities. Loading and unloading facilities shall have secondary containment. The secondary containment shall have a liquidtight floor and shall be sloped or curbed to prevent overflow. This containment shall be permitted to be connected to the drainage system *(see 4.2.2.2)* or shall be permitted to be contained at the unloading area.

4.6 Hazard Identification. All pesticide storage facilities shall have a hazard identification system.

4.6.1 Signs. All pesticide storage areas shall be identified as such by a sign in accordance with NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response.* Additionally, a sign that reads PESTICIDES in black 2-in. (5-cm) letters on a white background shall be posted. These signs shall be located in accordance with the authority having jurisdiction and shall meet EPA requirements.

4.6.2 Container Labels. Each container shall have a legible FIFRA label on the outside of the container that is visible from the usual directions of approach.

4.7 Training. Facilities storing pesticides shall have a training program. The training shall be based on current material safety data sheets (MSDS) and other information supplied by manufacturers.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

4.7.1 Persons responsible for the operation and maintenance of areas in which pesticides are stored shall be trained in the chemical and physical hazards of the stored materials and combinations of stored materials. The training shall include adequate coverage of other topical areas as required by 29 CFR 1910.1200, Occupational Safety and Health Administration, "Hazard Communication."

4.7.2 Persons responsible for the operation and maintenance of areas in which pesticides are stored shall be trained to understand the sequence of mitigation and protective actions necessary to contain and control pesticide releases. These persons shall be trained to competencies identified for the first responder operational level as described in NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents.*

4.7.3 Emergency response coordinators shall be trained to meet the requirements of incident commander or safety officer competency levels as described in NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents.*

4.7.4 Persons designated as responders to pesticide releases expected to perform defensive or offensive actions shall be trained to meet all requirements of 29 CFR 1910.120, Occupational Safety and Health Administration, "Hazardous Waste Operations and Emergency Response," and the requirements of the technician level as described in NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents.*

Chapter 5 Storage

5.1 Separation Requirements. Pesticide storage shall be separated from food and personal contact items such as clothing, linens, furniture, animal feeds, and animal health products by a liquidtight wall.

5.2 Segregation of Incompatible Materials. Incompatible materials shall not be stored within 25 ft (7.6 m) of pesticide storage areas unless separated by a liquidtight wall with a fire-resistance rating of 1 hour.

5.3 Pesticide Storage Location. Pesticides shall be stored only on the first floor. Any other storage or occupancy in a basement below the pesticide storage shall be approved by the authority having jurisdiction.

5.4 Storage Conditions.

5.4.1 Pesticides shall be stored to prevent deleterious contact with moisture, excessive heat, or freeze/thaw cycles, which can affect either container integrity or product stability.

5.4.2 Empty, unrinsed containers shall be treated as full containers.

5.4.3 Compressed Gas Pesticides.

5.4.3.1 Compressed gas pesticides shall be stored in an outdoor, covered area away from heat (e.g., steam pipes, heaters, direct sun).

5.4.3.2 Whether full or empty, containers shall be tightly closed, provided with a safety cap when not in use, and provided with labeling to indicate whether the individual container is full or empty.

5.4.3.3* Containers shall be separated by type, contents, and full or empty status. Compressed gas pesticides shall be separated from other compressed gases by pipe railings or other effective means acceptable to the authority having jurisdiction.

5.5 Storage Arrangements.

5.5.1 Containers shall be stacked stably, and stacks shall be limited in height, based on container integrity.

5.5.2 Where an original shipping container has been opened, the individual container shall be placed on stable shelving.

5.5.3 Where flammable or combustible pesticides are stored, storage shall comply with NFPA 30, *Flammable and Combustible Liquids Code.*

5.5.4 Nonflammable pesticides shall be stored in accordance with NFPA 230, *Standard for the Fire Protection of Storage.*

5.5.5 Rack storage of nonflammable pesticides shall comply with NFPA 230, *Standard for the Fire Protection of Storage.*

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1.2 Additional examples of agricultural pesticides covered by this code can be found in the *Farm Chemicals Handbook. (See Annex B.)*

A.3.2 Information on incompatible materials for pesticide formulations can be found in material safety data sheets (MSDS) or manufacturers' product bulletins.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

--`,,`-`-`,,`,,`,`,,`---
Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

A.3.2.3 Code. The decision to designate a standard as a "code" is based on such factors as the size and scope of the document, its intended use and form of adoption, and whether it contains substantial enforcement and administrative provisions.

A.3.2.5 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.4.1.2 Some materials covered by this code also have to comply with specific federal, state, and local regulations, as applicable.

A.4.2.2.2(3) This is the maximum amount of rainfall that would occur over a 24-hour period based on reviewing a 100-year period. This term is called a rainfall duration of "1 day and storm return period of 100 years" in National Weather Service documents.

A.4.2.3.2(1) The ventilation rate should be based on the following:

(1) Amount of the pesticide spilled, based on the worst credible case, which is dependent on the capacity of the largest stored pesticide container
(2) Volatility of the pesticide spilled (i.e., its vapor pressure)
(3) Accepted human exposure level as specified on the pesticide material safety data sheet (MSDS) or the pesticide container label

A.5.4.3.3 NFPA 55, *Standard for the Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Cylinders*, can be consulted for additional information on the storage of cylinder gases.

Annex B Typical Pesticides

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 Table B.1 provides a list of typical pesticides. "Danger" means the material poses a fire, toxicity, or corrosivity hazard.

Table B.1 Typical Pesticides with Signal Word "Danger"

2,4-DB
3,5-Xylyl Methylcarbamate
4-aminopyridine
Accord™
Acifon™
Advantage™
Aero Dyne-Amic™
Agribrom™
Agrofuran™
Agroxone™
Aldicarb
Aldoxycarb
Aldrin
alpha-Naphthylacetic Acid
Aluminum Phosphate
Amconil™
Amid-Thin™
Anilofos
Aniloguard™
Apache™
Arapam™
Arbex™
Arsenic Acid
Arvest™
Assert™
Attatox™
Avenge™
Avitrol™
Azinophos-ethyl
Azinophos-methyl
Azodrin™

Banox™
Banrot™
BareSpot™ Monobor-Chlorate
BareSpot™ Ureabor
Baygon™
Baythroid™
Baythroid 2™
Baythroid H™
Bidrin™
Bifenox
Birlane™
Bladafum™
Blasticidin-S
Blattanex™
Blazer™
Bomyl
Bounty™
Bravo™
Bravo Ultrex™
Broadstrike™ Plus
Brodifacoum
Brom-O-Gas™
Brom-O-Sol™
Busan 1236™
Butifos
Butoxone™
Butyrac™

Caid™
Calcium Arsenate
Calcium Cyanide
Camphechlor
Capfos™
Carbodan™
Carbofuran
Carbosan™
Carbosulfan
Carboxin
Carpene™
Carzol™
Charge™
Chipco™ Mocap™
Chipco™ Ronstar™
Chiptox™
Chlorfenvinphos
Chlorflurenol-methyl
Chlormephos
Chlorophacinone
Chlorothalonil
Chlorpropham
Chlorthiophos
Chlortram™
Chromated Copper Arsenate
Cildon™
Ciodrin™
ClortoCaffaro™
Clortosip™
Cobra™
Colonil™
Comite™
Commando™
Commodore™
Contraven™
Contur™
Copper 8-Quinolinolate
Copper Acetoarsenite
Copper Hydroxide
Copper Sulfate
Co-Rax™
Corrosive Sublimate
Cotnion-Methyl™
Counter™
Cov-R-Tox™
Credit™
Crisodrin™
Crisquat™
Crotoxyphos
Crysthion™ Cube Powder™
Cudgel™
Curtail™
Cybolt™
Cycloheximide
Cyclone™
Cyfluthrin
Cypona™

Daconil™
Dagger™
Danitol™
Dart™
DB Straight™
D-CON™
Decrotox™
DEF 6™
Demand CS™
Demeton-S-methyl
Denarin™
Denkavepon™
Detail™
Dibrom™
Dichlorvos
Diclofop-methyl
Dicron™
Dicrotophos
Difenacoum
Difenzoquat methyl sulfate
Dimecron™
Dimefox
Dimepax™
Dinitrophenol
Dinoseb
Dinoseb Acetate
Dinoterb
Dinoterb Acetate
Dioxathion
Diphacin™
Diphacinone
Disulfoton
Disultex™
Di-Syston™
Disyston™
Divipan™
DNOC
Dodemorph Acetate
Dodina™
Dodine
Doom™
Dormex™
Dotan™
DSM™
Duo-Kill™
Duraphos™
Dyfonate™

Echo™
Efuzin™
Ektafos™
Embutone™
Empal™
Endocel™
Endosulfan
Endothion
Endrin
Enzone™
EPN
Ethephon
Ethofumesate
Ethoprop
Ethrel™
Ethyl Dibromide

--`,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Table B.1 ***(Continued)***

Ethylene Oxide
Ethylthiodemeton

Fallowmaster™
Farmatox™
Fenamiphos
Fenbutatin-oxide
Fenpropathrin
Fighter™
Finaven™
Flucythrinate
Flumetralin
Fluoroacetamide
Folex™
Folimat™
Forgrow™
Formetanate Hydrochloride
Fortress™
Frigate™
Frumin AL™
Frunax DS Granules™
Fuciram™
Fungiless™
Funginex™
Furadex™

Gallup™
Garlon™
Gazelle™
Geomet™
Glifonox™
Glycel™
Glyfos™
Glyphosate
Glyphotox™
Gramocil™
Gramoxone™
Grandstand™
Granutox™
Grazon™
Gusathion™
Guthion™

Hawk™
Herb-neat™
Herbogil™
Herbolex™
Herboxone™
Hercon™ Vapotape II
Hexazinone
Hiltavax™
Hoelon™
Hydrogen Cyanamide
Hytox™

Icon™
Isoprocarb

Karate™
Keeper™
Kemikar™
Kemiron™
Kilval™
Kinadon™
Kipsin™
Kisvax™
Klerat™
KO-ZINC™

Lactofen
Lambda-cyhalothrin
Landmaster™ BW
Lannate™
Lanox™
Laser™
Lead Arsenate
Lime Sulfur
Lim-N8™
Lo-Dose™
Lontrel™
Lucanal™
Lucaphos™

Madurex™
MAFA
Magic™
Magnacide™ H
Magnesium Phosphide
Marshal™
Marvex Super™
Master™
Matador™
Matikus™
Matrak™
MCPA
Mecarbam
Medinoterb Acetate
Melprex™
MEMA
MEMC
Mercuric Oxide
Merphos
Metam 426™
Metam CLR™
Metam-sodium
Metaphor™
Methamidophos
Methavin™
Methidathion
Methomyl
Methyl Bromide
Methyl Parathion
Metiltriazotion
Metolcarb
Mevinphos
Mezene™
MIPC
Mocap™
Modown™
Monitor™
Monocrotophos
Monophos™
MTD

Naled
Naphthaleneacetamide
Naramycin
Nemacur™
Nico Soap™
Nogos™
Nortron™
Noxfire™
Noxfish™
Nuvacron™
Nuvalex™

Ole™
Olitref™
Omethoate
Omite™
Ornamite™
Osadan™
Oxadiazon
Oxamyl

Pamex™
Paradeep™
Paraphor™
Paraquat
Parathion
Paris Green
Pathfinder™
Payoff™
Pestab™
Phaser™
Phenylmercury Acetate
Phorate
Phosdrin™
Phosfolan
Phosphamidon
Phosvit™
Pilarfuran™
Pilarich™
Pluck™
PMA
Police™
Posse™
PQ-8™
Pramitol™
Prenfish™
Prentox™
Prime+™
Procure™
Prograss™
Prolex™
Promar™
Propaclor
Propargite
Propel™
Propionic Acid
Propogon™
Propoxur
Prosper™
Protocol™
Prozap™
Prozap™ Mouse Maze™

Ramik™
Ramrod™
Ranger™
Ratak™
Ratak™ Plus
Ratol™
RAX™
Reclaim™
Redentin™
Remedy™
Rhomene™
Rhonox™
Rilof™
Rodeo™
Rodex™
Ropax™
Rotenone
Roundup™
Rozol™
Rubetram™
Rugby™

SAGA™
Samourai™
Sanacarb™
Sapecron™
Saprol™
Satecid™
Scepter™ O.T.
Scimitar™
Scout X-TRA™
Sectagon™
Shotgun™
Sinflouran™
Sniper™
Sodanit™
Sodium Chlorate
Sodium Cyanide
Sodium Fluoroacetate
Sodium Pentachlorophenate
Solfac™
Solvirex™
Squadron™
Standak™
Starfire™
Steladone™
Stinger™
Strychnine
Suchlor™
Sulfuryl Fluoride
Sulgen™
Suncide™
Suncolonil™
Sunfuran™
Supex™
Supona™
Supracide™
Suprathion™
SURpHTAC™

Talon™
Tam™
Tamaron™
Tame™
Tech
Temik™
Tempo™
Tempo™ H
Terborox
Terbufos
Terrafuran™
Terraguard™
Terr-O-Gas™
Thallium Sulfate
Thalonex™
Thimet™
Thin-It™
Thiofanox
Thionate™
Thionic™
Tomcat™
Toxaphene
Tox-Hid™
Tralex™
Tralomethrin
Tramat™
Transline™
Treflan™
Triazotion
Tribufate
Tribufos
Triclopyr
Triflumizole
Trifluralin
Trifmine™
Trifocide™
Triforine
Trifrina™
Trilin™
Trimaton™
Triscabol™
Triverdax™
Trucidor™
Tuff Brite™
Turflon™
Tycap™

Ucetam™
Ultracide™
Unden™
Unicrop™
Unifos™
Uniquat™
Unisan™
Unite™

Vancide™ MZ-96
Vapam™

(continues)

--`,,,-`-`,,`,,`,`,,`---
Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Table B.1 ***(Continued)***

Vapona™	Vikane™	Warfarin	Wilthin™	Yellow Oxide of Mercury
Velpar™	Vitavax™	Warrior™	XMC	
Venceweed™	Volid™	WeatherBlok™		Zinc Phosphide
Vendex™	Volphor™	Weedless™	Yeh-Yan-Ku™	Zinc-Tox™
Venturol™	Vydate L™	Weedmaster™		Ziram

Source: *Farm Chemicals Handbook*, 1997 edition.

Annex C Supplementary Information on Emergency Response Plans

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

C.1 Emergency Response Plan (ERP) Requirements.

C.1.1 General. Any person storing materials that are covered by this code should submit an ERP form in accordance with this section and provide a written description of the operations and processes conducted at the facility.

C.1.2 Required Information. The ERP should include the information specified in C.1.2.1.

C.1.2.1 Hazardous Materials Inventory Statement (HMIS) Requirements.

C.1.2.1.1 A separate HMIS should be provided for each building, portion of a building, or exterior facility in which pesticides are stored or for which storage is planned.

C.1.2.1.2 The HMIS should include, by hazard class, all hazardous materials stored. The HMIS should include the following information for each hazardous material:

(1) Generic chemical name
(2) Common/trade name
(3) Formula or major constituents
(4) Manufacturer
(5) United Nations (UN) or North American (NA) ID number and CAS number
(6) Category hazard numbers and special hazard identifiers as provided in NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*
(7) Manufacturer's material safety data sheet
(8) Maximum quantity stored or planned to be stored at any one time

C.1.2.2 General Site Plan. A general site plan drawn on a legible scale should include, but should not be limited to the following:

(1) Location of all buildings, exterior storage facilities, permanent access ways, evacuation routes, parking lots, internal roads, chemical loading areas, equipment cleaning areas, storm and sanitary sewer accesses, emergency equipment, utility access points, and response equipment storage areas
(2) Adjacent property uses
(3) Other pertinent information

The exterior storage areas should be identified with the hazard class and the maximum quantities per hazard class of the hazardous materials stored. The authority having jurisdiction might also need information regarding the locations of wells, flood plains, earthquake faults, surface water bodies, and general land uses within maximum exposure distances for the general population as established by a hazard and risk analysis performed for the authority having jurisdiction.

C.1.2.3 Building Floor Plan. A building floor plan drawn to a legible scale should include, but should not be limited to, all hazardous materials storage facilities within the building and should indicate rooms, doorways, corridors, exits, and evacuation routes. Each hazardous materials storage facility should be identified on the plan with the hazard class and quantity range per hazard class of the hazardous materials stored.

C.1.2.4 Hazardous Materials Handling. Information should be included documenting that all activities involving the handling of hazardous materials should be conducted in a manner to prevent the accidental release of such materials.

C.1.2.5 Chemical Compatibility and Separation. Information should be included documenting procedures, controls, signs, or other methods to be used to ensure separation and protection of stored materials from factors that might cause accidental release of materials or ignition or reaction of ignitible or reactive materials.

C.1.2.6 Monitoring Program. Information including, but not limited to, the location, type, manufacturer's specifications (if applicable) and suitability of monitoring methods for each storage facility, where required, should be provided.

C.1.2.7 Security Precautions. A security program for preventing unauthorized entry of persons or animals into the storage facilities and for reducing the potential for theft, sabotage, or accidental release should be developed.

C.1.2.8 Hazard Labeling and Warning Signs. A description should be provided of warning markings on containers, storage areas, storage structures, surrounding fences, gates, and access ways.

C.1.2.9 Inspection and Record Keeping. Schedules and procedures for inspecting all safety monitoring and emergency equipment should be provided. The responsible official at the facility should develop and follow a written procedure that is acceptable to the authority having jurisdiction for the inspection of the facility for malfunction and deterioration of equipment, operator error, poor housekeeping practices, and discharges that might cause or lead to accidental discharges of hazardous materials. These inspections should be made frequently enough to detect the possible deterioration of equipment and facilities, the probability of human error, and problems prior to discharge. An inspection check sheet should be developed to be used in conjunction with routine inspections. The check sheet should provide the date, time, and location of inspection; note any problems, dates, and times of corrective actions taken; and note the name of the inspector and countersignature of the designated responsible official for the facility.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

C.1.2.10 Employee Training. A training program appropriate to the types and quantities of materials stored or used should be conducted to prepare employees to handle hazardous materials safely on a daily basis and during emergencies. This training program should include the following:

(1) Identification of all hazardous materials present and specific hazards of these materials
(2) Instructions in safe storage and handling of hazardous materials, including maintenance of monitoring records
(3) Instructions in emergency procedures for leaks, spills, fires, or explosions, including shutdown of operations and evacuation procedures
(4) Record-keeping procedures for documenting training provided to employees

C.1.2.11 Emergency Equipment. A description of emergency equipment and testing and maintenance procedures used to ensure safe and effective operations and competent emergency release incident response should be developed.

C.1.2.12 ERP should consider the following items:

(1) Availability of written emergency response plans (ERPs)
(2) Incident command system
(3) Responsibilities
(4) Hazardous materials drills
(5) Evaluation of drills
(6) ERP updating mechanism
(7) Rapport with fire department
(8) Release scenarios incorporated into an ERP
(9) Adequacy of emergency response team personnel and equipment

Annex D Restricted-Use Pesticides

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

D.1 Restricted-use pesticides represent unique commercial products in our society. They are biocidal products that generally are manufactured, stored, and used widely. The hazards of the active ingredients and formulated products vary widely in their target life forms, severity, and persistence. These materials and their byproducts of degradation and combustion can adversely affect the use of the structures where they are made, formulated, and stored as well as cause harmful exposures to human and animal populations and natural resources.

The combustibility and fire-induced failure mode of the packaging used for these pesticide products affects their ability to burn and to propagate fire. Container failures are of particular importance, not only because they can contribute to the additional release of combustible or flammable material, but they allow the uncontrolled release of pesticides into the environment. The latter is a special concern in terms of human health and the environment.

The potential losses associated with a release, with or without fire, should be evaluated from a larger perspective than conventional loss prevention assessments for commercial industrial occupancies. The first consideration in any release or fire impact scenario should be adequate preparation for the evacuation of employees and customers from the facility. Thereafter, all other factors should balance the potential for loss between property and the environment. Some of these factors are described in D.1.1 through D.1.8.

D.1.1 Location and Site Factors. At facilities involved with highly volatile materials, large fuel loads, and materials having toxic characteristics or toxic byproducts, the evaluation should consider the following:

(1) Are there nearby human populations that could be affected by a release?
(2) Are there unique or high-value environmental resources that could be affected by credible release?
(3) In a fire situation, can adjacent property and environmental assets be protected?

D.1.2 Other Occupancy Factors. The risk assessment should consider the implications of releases to those portions of the structure not used for pesticide storage and to occupants of the structure.

D.1.3 Packaging. Most pesticides are found in commerce as formulated products of a pesticidal active ingredient(s), diluents, and adjuvants. They are usually found in one of three forms: liquid, dry formulations, and contained gases.

Most dry formulations (e.g., tablets, pellets, powders, dusts, and granules) usually are packaged in combustible bags, in boxes, and in fiber or plastic containers of various sizes. Solvent and water-soluble bags are also utilized for some dry pesticide products. Liquid formulations (e.g., aqueous or solvent-based emulsions, suspensions, and solutions) usually are packaged in metal or plastic containers of various sizes, some of which are pressurized.

D.1.4 Chemical Properties. In addition to the inherent structural fire-loading, some pesticide products have unique chemical properties that pose special fire risks. For example, on contact with water, aluminum phosphide fumigant produces phosphene, a highly toxic flammable gas having an autoignition temperature of 212°F (100°C). These special fire risks should be considered in the risk assessment.

D.1.5 Mixed Product Storage. The assessment should consider segregated storage schemes for pesticide materials with significantly different toxicity, flammability, and residue characteristics. A complete analysis will assess mixed commodity storage and displays involving pesticide and nonpesticide materials. Fires in such mixed storage locations can increase or reduce the combustion process.

D.1.6 Smoke and Liquid Runoff. Smoke is generated when combustion occurs. Some amount of stoichiometric combustion of pesticide products can form relatively harmless gases. However, some dusts, vaporized pesticide materials, or toxic degradation products also could be present inside the fire's smoke plume. These airborne materials will reach the ground and can cause contamination.

Liquid runoff is created both as a result of product leakage from ruptured containers and from fire-fighting water (from sprinkler system discharge or hose streams). This liquid runoff, if beyond the capacity of the secondary containment provided, could contain pesticides and other toxic chemicals released during the fire and could contaminate the facility, the surrounding soil, and the adjacent ground and surface water.

D.1.7 Contaminated Debris. The disposition of contaminated building debris and soil, damaged product containers and contents, and contaminated runoff water resulting from a fire where a facility is damaged or destroyed should be considered. Not only does this present a cleanup problem, but this contaminated material exposes the surrounding property to further contamination if storm runoff is not contained. A risk

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

assessment should consider the potential impact on human health and the environment of runoff from such pesticide-contaminated debris.

D.1.8 Emergency Response. The capability and availability of emergency response, including location, equipment, and training, should be considered.

Annex E Sample Ordinance Adopting NFPA 434

E.1 The following sample ordinance is provided to assist a jurisdiction in the adoption of this code and is not part of this code.

ORDINANCE NO. _____

An ordinance of the *[jurisdiction]* adopting the *[year]* edition of NFPA *[document number], [complete document title]* documents listed in Chapter 2 of that *[code, standard]*; prescribing regulations governing conditions hazardous to life and property from fire or explosion; providing for the issuance of permits and collection of fees; repealing Ordinance No. _____ of the *[jurisdiction]* and all other ordinances and parts of ordinances in conflict therewith; providing a penalty; providing a severability clause; and providing for publication; and providing an effective date.

BE IT ORDAINED BY THE *[governing body]* OF THE *[jurisdiction]*:

SECTION 1 That the *[complete document title]* and documents adopted by Chapter 2, three (3) copies of which are on file and are open to inspection by the public in the office of the *[jurisdiction's keeper of records]* of the *[jurisdiction]*, are hereby adopted and incorporated into this ordinance as fully as if set out at length herein, and from the date on which this ordinance shall take effect, the provisions thereof shall be controlling within the limits of the *[jurisdiction]*. The same are hereby adopted as the *[code, standard]* of the *[jurisdiction]* for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion and providing for issuance of permits and collection of fees.

SECTION 2 Any person who shall violate any provision of this code or standard hereby adopted or fail to comply therewith; or who shall violate or fail to comply with any order made thereunder; or who shall build in violation of any detailed statement of specifications or plans submitted and approved thereunder; or failed to operate in accordance with any certificate or permit issued thereunder; and from which no appeal has been taken; or who shall fail to comply with such an order as affirmed or modified by or by a court of competent jurisdiction, within the time fixed herein, shall severally for each and every such violation and noncompliance, respectively, be guilty of a misdemeanor, punishable by a fine of not less than $_____ nor more than $_____ or by imprisonment for not less than _____ days nor more than _____ days or by both such fine and imprisonment. The imposition of one penalty for any violation shall not excuse the violation or permit it to continue; and all such persons shall be required to correct or remedy such violations or defects within a reasonable time; and when not otherwise specified the application of the above penalty shall not be held to prevent the enforced removal of prohibited conditions. Each day that prohibited conditions are maintained shall constitute a separate offense.

SECTION 3 Additions, insertions, and changes — that the *[year]* edition of NFPA *[document number], [complete document title]* is amended and changed in the following respects:

List Amendments

SECTION 4 That ordinance No. _____ of *[jurisdiction]* entitled *[fill in the title of the ordinance or ordinances in effect at the present time]* and all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

SECTION 5 That if any section, subsection, sentence, clause, or phrase of this ordinance is, for any reason, held to be invalid or unconstitutional, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The *[governing body]* hereby declares that it would have passed this ordinance, and each section, subsection, clause, or phrase hereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, and phrases be declared unconstitutional.

SECTION 6 That the *[jurisdiction's keeper of records]* is hereby ordered and directed to cause this ordinance to be published.

[NOTE: An additional provision may be required to direct the number of times the ordinance is to be published and to specify that it is to be in a newspaper in general circulation. Posting may also be required.]

SECTION 7 That this ordinance and the rules, regulations, provisions, requirements, orders, and matters established and adopted hereby shall take effect and be in full force and effect *[time period]* from and after the date of its final passage and adoption.

Annex F Informational References

F.1 Referenced Publications. The following documents or portions thereof are referenced within this code for informational purposes only and are thus not part of the requirements of this document unless also listed in Chapter 2.

F.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 55, *Standard for the Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Cylinders*, 1998 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, 2001 edition.

F.1.2 Other Publications. (Reserved)

F.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

F.2.1 Risk Management and Prevention Program Unit (RMPP) references can be obtained from Los Angeles City Fire Department Risk Management and Prevention Program Unit, 200 N. Main Street, Room 990, Los Angeles, CA 90012.

F.2.2 *Farm Chemicals Handbook*, Meister Publishing Co., Willoughby, OH, 1997.

F.3 References for Extracts. The following documents are listed here to provide reference information, including title and edition, for extracts given throughout this code as indicated by a reference in brackets [ ] following a section or paragraph. These documents are not a part of the requirements of this document unless also listed in Chapter 2 for other reasons.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, 2000 edition.

NFPA 1124, *Code for the Manufacture, Transportation, and Storage of Fireworks and Pyrotechnic Articles*, 1998 edition.

--`,,`-`-`,,`,,`,`,,`---
Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Index

© 2002 National Fire Protection Association. All Rights Reserved.

The copyright in this index is separate and distinct from the copyright in the document that it indexes. The licensing provisions set forth for the document are not applicable to this index. This index may not be reproduced in whole or in part by any means without the express written permission of NFPA.

-A-

Application of other documents 1.3
Approved (definition) 3.2.1, A.3.2.1
Authority having jurisdiction
Construction/modification plans approved by 4.1.1
Container separation methods approved by 5.4.3.3
Definition 3.2.2, A.3.2.2
Facility closure notification to 4.1.3
Release of pesticide notification to 4.1.2.3
Response plans approved by 4.1.2
Storage location approved by 5.3

-B-

Basements 5.3
Definition 3.3.1
Buildings ..... 4.2, A.4.2.2.2(3), A.4.2.3.2(1)
Closing 4.1.3
Construction 4.1.1, 4.2.1
Existing 1.1.5
Floor plan C.1.2.3
Floors ..... 4.2.2, A.4.2.2.2(3)
Modifications 4.1.1
Ventilation ..... 4.2.3, A.4.2.3.2(1)

-C-

Chemical properties of pesticides C.1.2.5, D.1.4
Closed containers 5.4.3.2
Definition 3.3.3.1
Code (definition) 3.2.3, A.3.2.3
Commercial users (definition) 3.3.2
Compressed gas pesticides 5.4.3, A.5.4.3.3
Containers
Closed 5.4.3.2
Definition 3.3.3.1
For compressed gas pesticides ..... 5.4.3.2 to 5.4.3.3, A.5.4.3.3
Definition 3.3.3
Empty ..... 5.4.2, 5.4.3.2 to 5.4.3.3, A.5.4.3.3
Labeling 4.6.2, C.1.2.8
Leakage 4.1.4.4
Storage arrangements 5.5
Containment ..... *see* Secondary containment; Spill control
Contaminated materials, disposition of 4.1.4.3
Leaking containers 4.1.4.4
Pallets 4.1.4.5
Cutting 4.3.3

-D-

Debris, contaminated D.1.7
Definitions ..... Chap. 3
Drainage ..... 4.2.2.1 to 4.2.2.2, A.4.2.2.2(3)

-E-

Electrical installations ..... 4.2.4 to 4.2.5
Emergency equipment C.1.2.11
Emergency response coordinators 4.1.2.1, 4.7.3
Emergency response plans (ERP) ..... 4.1.2, A.4.1.2, Annex C, D.1.8
Employee training 4.7, C.1.2.10
Enforcement of code ..... 1.5, Annex E
Equivalency to code 1.4

-F-

Fire protection 4.4
Fire suppression systems ..... 4.2.1 Ex.
Flammable or combustible pesticides 5.5.3
Floor plans C.1.2.3
Floors 4.2.2

-H-

Hazardous Materials Inventory Statements (HMIS) C.1.2.1
Hazardous materials response plans 4.1.2, A.4.1.2
Hazards
Identification ..... 1.1.4 Ex. 1, 4.6, C.1.2.8
Management 4.1, A.4.1.2, C.1.2.4
Housekeeping 4.1.4

-I-

Ignition sources, control of 4.3
Illumination 4.2.5
Inspection C.1.2.9

-L-

Labels/labeled
Containers, FIFRA label on 4.6.2
Definition 3.2.4
Warning markings, description of C.1.2.8
Liquid runoff ..... *see* Spill control
Listed (definition) 3.2.5, A.3.2.5
Loading and unloading facilities 4.5

-M-

Material safety data sheets (MSDS) 4.7
Definition 3.3.4
Monitoring program C.1.2.6

-N-

Noncombustible materials 4.2.1
Nonflammable pesticides ..... 5.5.4 to 5.5.5

-P-

Packaging ..... D.1.3; *see also* Containers
Pallets, contaminated 4.1.4.5
Persons (definition) 3.3.5
Pest (definition) 3.3.6
Pesticides
Chemical properties of C.1.2.5, D.1.4
Definition 3.3.7
Flammable or combustible 5.5.3
Nonflammable ..... 5.5.4 to 5.5.5
Release of ..... 4.1.2.3 to 4.1.2.4, D.1.6; *see also* Spill control
Restricted-use ..... Annex D
Definition 3.3.7.1
Storage ..... *see* Storage
Typical pesticides, list of ..... Annex B
Unsaleable 4.1.4.2
Purpose of code 1.2

-R-

Rack storage 5.5.5

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Rail cars 1.1.4 Ex.2, 4.2.2.3
Record keeping C.1.2.9
References ..... Chap. 2, Annex F
Release of pesticides ... 4.1.2.3 to 4.1.2.4, D.1.6; *see also* Spill control
Restricted-use pesticides ..... Annex D
Definition 3.3.7.1
Risk assessment 4.4

-S-

Scope of code 1.1, A.1.1.2
Secondary containment D.1.6
Definition 3.3.8
Floors ..... 4.2.2.2 to 4.2.2.3, A.4.2.2.2(3)
Loading and unloading facilities 4.5
Security precautions C.1.2.7
Segregated materials D.1.5
Incompatible materials 5.2
Separation requirements 5.1, C.1.2.5
Shall (definition) 3.2.6
Should (definition) 3.2.7
Signs
No smoking 4.3.2
Pesticide storage areas 4.6.1, C.1.2.8
Warning C.1.2.8
Site plans C.1.2.2
Smoke, contamination from D.1.6
Smoking ..... 4.3.1 to 4.3.2
Spill control ..... 4.2.2.1 to 4.2.2.2, A.4.2.2.2(3), D.1.6 to D.1.7
Storage ..... Chap. 5, A.5.4.3.3; *see also* Containers
Arrangements 5.5
Conditions 5.4, A.5.4.3.3
Of incompatible materials 5.2
Location 5.3, D.1.1
Mixed product D.1.5
Separation requirements 5.1, C.1.2.5, D.1.5
Storage facilities .....*See* Buildings
Structures .....*See* Buildings

-T-

Tank trucks ..... 1.1.4 Ex. 2, 4.2.2.3
Temporary storage 4.2.2.3
Training 4.7, C.1.2.10

-U-

Unsaleable goods 4.1.4.2

-V-

Vehicles ..... 1.1.4 Ex. 2, 4.2.2.3
Ventilation ..... 4.2.3, A.4.2.3.2(1)

-W-

Warehouse (definition) 3.3.9
Welding 4.3.3

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale