AMERICAN NATIONAL STANDARD

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Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants

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Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants

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Foreword

This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard.

The last version of ISA-71.04 was published in 1985, using the ANSI and ISA periodic maintenance procedures. Based upon these procedures, the entire standard was publicly reviewed and published in its entirety.

This 2013 edition of the standard has several new features and includes updates due to the changes required for electronic equipment based on RoHS* or “lead-free” regulations that were originally passed into law in the European Union [EU 2003]* but have now been passed into law in many other countries. The committee welcomes suggestions for improving the standard.

Major changes in this 2013 version include:

- Added discussion of deliquescent relative humidity of dust as a measure of the corrosivity of dust
- Included silver reactivity as a metric for determining overall environmental classifications
- Provided definition of standard coupons to be used for reactivity monitoring
- Allowed for alternate passive and real-time methods of reactivity monitoring
- Moved discussion of corrosive contaminants to Annex B
- Added a bibliography

This document is one of several standards covering various environmental conditions affecting electronic equipment, including process measurement and control systems, data communications and IT hardware, and office electronics. In developing this standard, the committee goals included:

1. To provide a practical standard that can be applied with a minimum of research and technical effort by the user
2. To provide a concise method of stating environmental classifications for convenient communications between users of the standard
3. To cover real-world ranges of each classified parameter

This standard is limited to airborne contaminants and biological influences only, covering contamination influences that affect electronic equipment.

* European Union (EU) directive 2002/95/EC on the Restriction of the use of certain hazardous substances in electrical and electronic equipment.” Official Journal L 037, 13/02/2003 P. 0019 – 0023.
See http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:037:0019:0023:EN:PDF

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1 Purpose

The purpose of this standard is to classify airborne contaminants and biological influences that may affect electronic hardware, such as process measurement and control instruments, information technology (IT), telecommunications, networking and data center equipment, and electronic office equipment.

The classification system provides users and manufacturers of electronic hardware with a means of specifying the type and concentration of airborne contaminants to which a specified piece of electronic hardware may be exposed.

This document is one of a series of standards on environmental conditions.

2 Scope

This standard covers airborne contaminants and biological influences that affect industrial process measurement and control equipment, electronic office equipment, and data center and network equipment. Specific examples of electronic office equipment include: laptop computers, desktop computers, workstations, servers, data storage hardware, terminals, displays, laser and inkjet printers, copiers, and fax machines. Examples of data center equipment include: servers, switches, routers, displays, keyboards, data storage hardware, power distribution equipment, and climate control equipment such as heating, ventilating, and air-conditioning (HVAC).[†] Some examples of networking equipment include telecommunications hardware, switches, and routers.

This standard establishes airborne contaminant classes for fixed (non-mobile) installations during normal operation (non-emergency conditions) or during transportation and storage.

The classes of conditions stated in this standard are suitable for electronic equipment in office, data center, networking, and process control environments. Activities addressed by this standard in these environments include design, manufacturing, sales, installation, test, use, and maintenance. These classes may also be used as a guide when establishing requirements for environmental control of buildings or other protective housings for industrial process measurement and control systems.

These classifications pertain only to the environment external to the equipment that may affect the equipment externally or internally.

The effects of environmental conditions on the safety, comfort, and performance of operating and maintenance personnel are not considered in this standard.

This standard covers airborne contaminants and biological influences that affect electronic equipment. Specifications for other environmental conditions, including nuclear radiation and hazardous atmospheres, are beyond the scope of this standard.

CAUTION — AIRBORNE OR BIOLOGICAL CONTAMINANTS NOT LISTED IN THIS DOCUMENT COULD CAUSE EQUIPMENT DAMAGE. CAUTION SHOULD BE USED WHEN A COMBINATION OF FACTORS APPROACH OR SURPASS CLASS "X." OBTAINING THE GUIDANCE OF A CHEMICAL SPECIALIST IS SUGGESTED WHEN THIS CONDITION OCCURS.

[†] HVAC equipment used in IT/data communications applications are commonly referred to as computer room air conditioning (CRAC) units and/or computer room air handling (CRAH) units.