

ANSI/RIA R15.05-3-1992 ◀

# American National Standard

*for Industrial Robots and Robot Systems –  
Reliability Acceptance Testing –  
Guidelines*



**American National Standards Institute**

11 West 42nd Street  
New York, New York  
10036

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for Industrial Robots and Robot Systems –  
Reliability Acceptance Testing –  
Guidelines**

Secretariat

**Robotic Industries Association**

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**Foreword** (This foreword is not part of American National Standard ANSI/RIA R15.05-3-1992.)

This standard provides the minimum test requirements necessary to determine the suitability of a newly manufactured (or newly rebuilt) industrial robot to be placed in service without the need to perform additional reliability verification testing.

This standard is an Infant Mortality Life Test method followed by a performance verification. It is intended that this standard replace a multiplicity of robot users' test and/or specification requirements that are to be performed (or met) prior to placing a robot into service.

This standard also provides for the use of an optional test method to accommodate those robots which have unique configurations or unusual performance capabilities. The optional test method also accommodates those robot manufacturers and rebuilders whose manufacturing techniques employ state-of-the-art quality assurance methods that are equivalent to or exceed the intent of this standard.

This standard is not a safety standard and therefore does not directly address the safety issues related to robot performance and operation. It is the responsibility of whomever uses this standard to consult and utilize appropriate safety standards and health practices.

Use of industry standards, including this standard, is voluntary. The Robotic Industries Association makes no determination with respect to whether any robot, manufacturer, or user is in compliance with this standard.

Suggestions for improvement of this standard are welcome and should be sent to Subcommittee R15.05-WG1 on Reliability, Robotic Industries Association, 900 Victors Way/P.O. Box 3724, Ann Arbor, Michigan 48106.

The Subcommittee R15.05-WG1 on Reliability, which developed this standard, had the following members:

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## American National Standard for Industrial Robots and Robot Systems –

# Reliability Acceptance Testing – Guidelines

## 1 Scope, purpose and exclusions

### 1.1 Scope

This standard is intended to provide the minimum testing requirements that will qualify a newly manufactured or a newly rebuilt industrial robot to be placed into use without additional infant mortality testing.

### 1.2 Purpose

The purpose of this standard is to provide assurance, through testing, that infant mortality failures in industrial robots have been detected and corrected by the manufacturer (or rebuilder) at their facility, prior to shipment to a user (See figure 1, "Theoretical failure-rate life curve") These tests may be reproduced by the user if desired

### 1.3 Exclusions

This standard applies to robots and robot systems only and is not intended to apply to the following.

- Automatic guided vehicles and systems,
- Automatic conveyors and shuttle systems;
- Mobile robots;
- Tele-operators;
- Prosthetic and other aids for the handicapped,
- Automated storage and retrieval systems,
- Numerically controlled machine tools;
- Personal robots;
- Undersea and space robots.

This list is not intended to be all-inclusive.

## 2 Normative references

The following standard contains provisions which, through reference in this text, constitute provisions of this American National standard. 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 standard indicated below.

ISO TR 8373, *Manipulating Industrial Robots - Vocabulary*<sup>1)</sup>

## 3 Definitions

### 3.1 components:

**critical:** Any component that is safety-related or one that, if it fails, will cause the robot to stop while in its continuous run mode or that is necessary for proper robot operation and control

**non-critical:** Any component that is not a part of the robot's safety system or one that is not critical to the robot's operation.

**3.2 cycle:** A single execution of a complete set of moves and functions contained within a robot's program.

**3.3 industrial robot:** A reprogrammable, multifunctional manipulator designed to move material, parts, tools or specialized devices through variable programmed motions for the performance of a variety of tasks.

<sup>1)</sup> Available from American National Standards Institute, 11 West 42nd Street, New York, NY 10036.