इंटरनेट मानक

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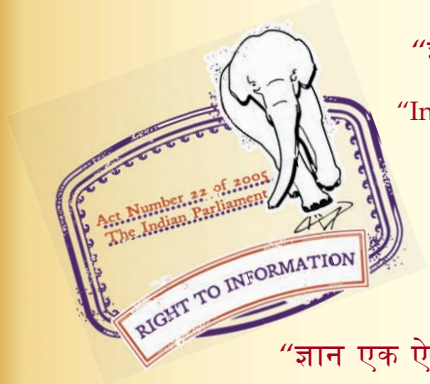
"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 14473-1 (1997): Cranes - Inspections, Part 1: General
[MED 14: Cranes, Lifting Chains and Related Equipment]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 14473 (Part 1) : 1997
ISO 9927-1 : 1994
(Reaffirmed 2003)

भारतीय मानक

क्रेन — निरीक्षण

भाग 1 सामान्य

Indian Standard

CRANES — INSPECTIONS

PART 1 GENERAL

ICS 53.020.20

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1997

Price Group 2

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 9927-1 : 1994 'Cranes — Inspections — Part 1 : General', issued by International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendations of the Cranes, Lifting Chains and Its Related Equipment Sectional Committee, and approval of the Heavy Mechanical Engineering Division Council.

This standard is being published in five parts. Other parts of the standard are as follows:

Part 2 Mobile cranes

Part 3 Tower cranes

Part 4 Jib cranes

Part 5 Overhead travelling and portal bridge cranes

The text of ISO standard has been approved for publication as Indian Standard without deviations. Certain terminology and conventions are, however, not identical to those used in Indian Standards. Accordingly, wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 4306-1 : 1990	IS 13473 (Part 1) : 1992 Cranes — Vocabulary: Part 1 General	Identical
*ISO 4306-2 : 1994	IS 13473 (Part 2) : 1992 Cranes — Vocabulary: Part 2 Mobile cranes	Technically Equivalent
ISO 4306-3 : 1991	IS 13473 (Part 3) : 1993 Cranes — Vocabulary: Part 3 Tower cranes	Identical

*ISO 4306-2 : 1985 was adopted as IS 13473 (Part 2) : 1992. Now, ISO 4306-2 has been revised in 1994. Hence the degree of equivalence for corresponding Indian Standard is shown as Technically Equivalent.

Indian Standard
CRANES — INSPECTIONS
PART 1 GENERAL

1 Scope

This part of ISO 9927 specifies the regular inspections to be carried out on cranes as defined in ISO 4306-1, ISO 4306-2 and ISO 4306-3.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9927. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9927 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.

ISO 4306-1:1990, *Cranes — Vocabulary — Part 1: General.*

ISO 4306-2:1994, *Cranes — Vocabulary — Part 2: Mobile cranes.*

ISO 4306-3:1991, *Cranes — Vocabulary — Part 3: Tower cranes.*

3 General

In order to ensure safe operation of cranes, their proper working and operational condition shall be maintained. Therefore all cranes need to undergo regular inspections. This ensures that deviations from safe conditions are detected and can be rectified. The inspections shall be arranged by the user.

4 Inspection prior to operation

Prior to operation, the crane shall be checked by the crane driver.

In general, the inspection prior to operation is a functional test of the safety equipment carried out in accordance with the operating instructions, and a visual inspection for obvious defects.

5 Regular inspections

5.1 Inspection intervals

Depending on the duration of operation and the operating and factory conditions, cranes shall be inspected by an experienced technician (5.2.1) or an expert engineer (5.2.2) as and when necessary, but at least once a year.

5.2 Inspecting personnel

5.2.1 Experienced technicians are persons who, due to their vocational background and experience, have sufficient knowledge in the field of cranes and are sufficiently familiar with the relevant regulations to determine deviations from the proper conditions (i.e. specially trained personnel).

5.2.2 Expert engineers are engineers experienced in the design, construction or maintenance of cranes, with sufficient knowledge of the relevant regulations and standards, who have equipment necessary for carrying out the inspection and are in a position to judge the safe condition of the crane and to decide which measures shall be taken in order to ensure further safe operation.

5.3 Type of inspection

In general, a regular inspection consists of the visual examination and verification of function and effectiveness. Unless stipulated by other regulations or by the manufacturer, it is not normally necessary for the experienced technician to disassemble any parts. Inspections by expert engineers, however, may involve disassembling parts so that the safe condition of the crane may be assessed.

The inspections shall be carried out in the following order:

— verification of the identification of the crane, including the labelling;

— verification of the condition of components and equipment with reference to damage, wear, corrosion or any other change;

— functional test of mechanisms;

— verification of the state and efficiency of safety equipment and brakes under nominal load.

An example of a check-list for the inspection of various types of cranes is given in annex A.

5.4 Results of the inspection

The results of the regular inspection shall be recorded by the personnel carrying out the inspection.

Reports by experienced technicians shall detail all observations. Reports by expert engineers shall contain the conclusions drawn from the observations.

Reports shall include the following:

— the scope of the inspection;

— any partial inspection still to be carried out;

— the defects that have been found;

— assessment as to whether or not there is any cause for concern regarding the further operation of the crane.

Annex A
(informative)

Example of a check-list for regular inspections of cranes

Check-list

The details to be checked are given below.

Element	Verification to be made
1 Components and mechanical equipment	
1.1 Crane runway structure	
Pillars, girders, bars, connections	Condition (cracks, deformation, wear, corrosion)
1.2 Access ladders and walkways	
Steps, rungs, beams, covering of walkways, platforms, etc.	Installation, condition
Protective guarding (railing, intermediate bars, hoop guard, toe guards)	
Information labels and boards marking hazardous areas	
1.3 Crane and trolley tracks	
Travel rails, runway stops	Installation and condition, track gauge, span, deformation
Locking and latching devices	Condition, function
1.4 Crane structure (bridge, portal mast, jib, tower)	
Girders, bars, connections, buffers, end stops, bracings	Cracks, deformation, wear, fastening elements, condition, alignment
1.5 Trolley structure (structure, jib)	
Girders, bars, connections, slewing rims	Condition
1.6 Assemblies	
Travel wheels, shafts, couplings, drums, sheaves, compensating sheaves with pins	Fitting and securing of removable parts, condition
Gear wheels, worm gears	Function
Screws, nuts, wedges	Support
Hydraulic and pneumatic components	Protection of assembly
Mechanical warning devices, limit stop devices, overload protection	Condition, function
1.7 Brakes	
Discs, shoes, belts, levers, release units, weights, pins, springs	Condition, function, brake test with load (test load in the capacity range)
1.8 Lubrication	
Lubrication systems and lubrication points	Sufficient filling, accessibility, identification
1.9 Clearances	Compliance, also with regard to subsequently added elements
1.10 Foundations, anchorages	Condition and installation

Element	Verification to be made
2 Electrical equipment	
2.1 Switches and actuating devices	
Mains connection switch, isolating switch, crane switch, control gear, contactors, overcurrent protection, limit switches, overload protection	Accessibility, condition, function, identification
2.2 Supply lines	
Mobile connecting lines, busbar lines, insulators, current collectors, permanently laid lines	Installation, polarity, condition
2.3 Current consumers	
Motors, brake release units, resistors, heaters, lighting, warning and signalling systems, load-lifting magnets and other energy-consuming lifting attachments	Condition, polarity, function
2.4 Protection	Protection against direct and indirect contact, insertion of polyethylene conductors and of insulators in control systems
3 Handling accessories (ropes, chains, belts, etc.) [1]	
3.1 Cables	The nature and number of broken wires, wear due to friction, corrosion pits, pinches, loosening of the outer wire layer and other changes in cable construction
	Protection preventing the cable from leaving its track
	Condition of the cable anchorage
	Shielding against heat radiation when transporting molten metal
3.2 Chains	Deformation
	Elongation, wear, cracks, securing of pins by means of rivets or rings, etc., correct running on sprockets, chain protection bracket (installed and working)
3.3 Load hooks, grabs, tongs and other load-handling accessories	Deformation, deformation and pinches in the mouth of the hook, cracks, wear, corrosion, securing of hook nut, securing devices for preventing load from falling off (if specified)

1) For correct assessment of handling accessories, it may be necessary to disassemble parts. During the inspection, handling accessories shall be inspected over their entire length, including hidden parts, e.g. contact surfaces on compensating sheaves, pressure points under cable clips and cable anchorages.

Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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