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**Cranes — Measurement of velocity and  
time parameters**

*Appareils de levage à charge suspendue — Mesurage des paramètres  
de vitesse et de temps*

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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13202 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 4, *Test methods*.

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# Cranes — Measurement of velocity and time parameters

## 1 Scope

This International Standard establishes guidelines for the measurement of the velocity and time parameters of cranes as defined in ISO 7363.

This International Standard is complementary to ISO 4310 and covers the types of crane specified therein.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4310, *Cranes — Test code and procedures*

ISO 7363, *Cranes and lifting appliances — Technical characteristics and acceptance documents*

ISO 9373, *Cranes and related equipment — Accuracy requirements for measuring parameters during testing*

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## 3 Test conditions

Test conditions shall meet the requirements of ISO 4310.

Before conducting the test, crane systems and mechanisms shall be checked for proper functioning while running without load.

A crane presented for testing shall be equipped in accordance with the manufacturer's specification and shall comply with ISO 7363.

## 4 Measuring apparatus and their accuracy

Measuring apparatus used in crane tests to determine motion velocity and time parameters shall be selected in accordance with the accuracy required in ISO 9373 and in compliance with national specifications.

The number of measurements and the allowable tolerance on the values of motion velocity and time parameters measured during testing shall meet the requirements of ISO 9373.

## 5 Test procedure

Before taking measurements of velocity and time parameters, trial cycles should be carried out to ensure that the elements (components) of the crane perform in the manner required for the test.

Measurements of maximum, minimum and specified intermediate motion velocities (or their corresponding time parameters) of other elements (components) of the crane shall be taken, as appropriate, in the loaded and unloaded conditions.

The linear motion velocity of the elements (components) or crane shall be determined by calculation from measurements of the time required to traverse the measured test path length. The acceleration and deceleration parts of the motion shall be excluded. The measurement results shall be recorded.

The angular motion velocity of the elements (components) or crane shall be determined by calculation from the measurements of the time required to move along the test arc. The acceleration and deceleration parts of the motion shall be excluded. The measurement results shall be recorded.

Table A.1 shows a format example for calculation of the average linear motion velocity. Table A.2 shows a format example for calculation of the average angular motion velocity. These values may also be determined in other appropriate formats.

## **6 Test report**

The test report on the measurement of motion velocity and time parameters shall include the following data:

- a) crane designation and type;
- b) crane identification or serial number;
- c) manufacturer;
- d) date of the measurement;
- e) description of the crane and equipment;
- f) description of the measuring apparatus and method;
- g) test conditions;
- h) location and state of test ground, road, track, as appropriate;
- i) crane configuration during each test;
- j) results of measurements of maximum load capacity (tabulated);
- k) name of the person supervising the testing.

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## Annex A (informative)

### Format examples for representation of measurement results of velocity and time parameters

**Table A.1 — Measurements of linear velocities and time intervals for the elements (components)  
of the crane and the crane as a whole**

No. of measurement	Direction of movement	Time measurement interval	Path length measured	Motion velocity
		$t$	$l$	$v = \frac{l}{t}$
		s	m	m/s
1		$t_1$	$l_1$	$v_1$
2		$t_2$	$l_2$	$v_2$
3		$t_3$	$l_3$	$v_3$
....	....	....	....	....
$n$		$t_n$	$l_n$	$v_n$
Average motion velocity: $v_a = (v_1 + v_2 + v_3 + \dots + v_n)/n$ .				

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**Table A.2 — Measurements of angular velocities and time intervals for the elements (components)  
of the crane and the crane as a whole**

No. of measurement	Direction of movement	Time measurement interval	Arc of path measured	Angular velocity
		$t$	$\alpha$	$\omega = \frac{\alpha}{t}$
		s	rad	rad/s
1		$t_1$	$\alpha_1$	$\omega_1$
2		$t_2$	$\alpha_2$	$\omega_2$
3		$t_3$	$\alpha_3$	$\omega_3$
....	....	....	....	....
$n$		$t_n$	$\alpha_n$	$\omega_n$
Average angular velocity: $\omega_a = (\omega_1 + \omega_2 + \omega_3 + \dots + \omega_n)/n$ .				

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