



## Understanding Vibration Certification and ISO 18436-2

Vibration certification is done in accordance with the ISO 18436-2 standard. ISO does not write vibration courses or exams, nor do they certify vibration analysts. No one can say they are “ISO Certified” ISO writes standards, and that is all they do.

The standard related to vibration analysis certification specifies the topics the courses should cover, the number of training hours and questions on the exam and the passing grade. It also states the work experience required by someone seeking certification (more on this below)

This is the exact title of the standard: **ISO 18436-2:2014**

### **Condition monitoring and diagnostics of machines — Requirements for qualification and assessment of personnel — Part 2: Vibration condition monitoring and diagnostics**

Zenco’s courses meet or exceed the requirements of ISO 18436-2 in all categories. Therefore, if you take a course and pass the exam with Zenco you will be “Certified in Accordance with ISO 18436-2.” This is what your certificate will say, and when you put this on your resume or CV or are applying for a job, you can confidently say that you are certified in accordance with the standard.

There is no single organization in the world that can claim they have the exclusive right to certify vibration analysts or that their certification has more meaning or value than those from other organizations. As long as the courses follow the ISO 18436-2 guidelines, the certification is valid. When seeking certification one should consider the experience, reputation and integrity of the instructor and the quality of the training materials. One should ask if the course follows ISO 18436-2 guidelines.

### **Experience Requirements**

You may take one of our courses and pass the exam prior to meeting the work experience requirements. You will receive a certificate stating that you have completed the course and passed the exam. When you have enough work experience, simply let us know and we will send you your certification.

Cat 1 certification is not required for Cat 2, but Cat 2 is required for Cat 3 etc. It is highly recommended that you begin with Cat 1 so you have a firm foundation to stand on as you go forward.

**Cat 1 = 6 months; Cat 2 = 12 months; Cat 3 = 36 months; Cat 4 = 60 months**

As part of the course registration process, you will be required to describe your work experience and provide contact information for a supervisor who can confirm that experience.

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## Exams

The exams are created from a randomized database of questions in each category. Exam questions are reviewed for accuracy, wording etc and updated and improved as needed. Exams are multiple-choice with options: a, b, c, d. Exams are closed book but formula sheets and charts are provided as needed. The chart below comes from the ISO 18436-2 standard.

Category	Number of questions	Examination duration	Pass grade
		h	%
I	60	2	70
II	100	3	70
III	100	4	70
IV	60	5	70

Students who pass the exam and have the required experience will receive a certification valid for 5 years. We will contact you when your 5 years are almost up. If you are still working in the field, we will renew your certification for an additional 5 years (there might be a small service charge associated with this.) If we cannot contact you and your certification lapses, or you are no longer working in the field but wish to get recertified, you will need to re take the exam. There are no yearly fees or dues required to maintain your certification.

If you pass the exam but do not yet have the work experience, we will issue you a certificate stating that you have completed the course and passed the exam. When you have the required work experience, just let us know and we will send you your certification.

Students who fail the exam must wait a minimum of 30 days before retaking it. They must prove that they are engaged in studying for the exam. You might be eligible to re sit all or parts of the course for a nominal charge. You may attempt the exam a maximum of 3 times in one calendar year. There are a variety of ways to re take the exams. There will be fees associated with re-sits.

All efforts are made to ensure exam integrity and confidentiality.

## Descriptions of Cat I -III from the ISO Standard

Please note, we have 30 years of experience teaching vibration analysis courses and our goal is to make sure you are successful in your job. What follows in this section are the descriptions of what certified analysts should be capable of doing according to ISO 18436-2. Our courses meet these requirements; however our goal is to also teach the practical skills and knowledge you will need to be successful in your day to day work. In this way, our courses exceed the requirements of the standard. In other words, we meet the standard and we also teach you the practical things that we believe you need to know.

### Category I

Personnel classified to category I are able to perform a range of pre-defined, generally simple single channel, machinery vibration condition monitoring activities in accordance with established procedures.

All activities shall be performed under direction.

Personnel classified to category I shall at least:

- a) know of the basic principles of vibration and recognize the different units of measurement;
- b) be able to collect reliable data ensuring appropriate standards of repeatability;
- c) be able to identify errors in collected data;
- d) be able to retrieve pre-defined measurement settings for use with VA equipment and transfer data from an analysis system to a computer-based system;
- e) be able to compare overall or single-value vibration measurements against pre-established alert settings;
- f) be able to identify deviations from the norm for single-value vibration values and trends;
- g) report on visual observations of equipment condition.

They shall not be responsible for:

- a) the choice of sensor, test method or technique or for any analysis or diagnosis to be conducted;
- b) the assessment of test results, other than identifying conditions against pre-established criteria,
- c) such as acceptance, alert, alarm, shutdown, etc.

### Category II

Personnel classified to category II are able to perform industrial machinery vibration measurements and basic VA using single-channel measurements, with or without phase trigger signals, according to established and recognized procedures. They require all the knowledge, experience and skills expected of category I, and in addition they shall at least:

- a) be able to define the measurement activities to be undertaken by a category I individual in the course of routine data collection;
- b) be aware of and capable of using the basic principles of signal analysis and, as such, can define acquisition and analysis settings to collect data appropriate to the machine(s) monitored;
- c) be able to perform basic (single-channel) impact tests to determine natural frequencies;
- d) be able to interpret and evaluate test results from routine analysis and acceptance tests in accordance with specifications and standards;
- e) be able to diagnose common fault indications and recommend basic corrective actions commensurate with their area of machinery experience including carrying out single-plane balancing of rigid rotors with or without phase;
- f) be able to provide technical guidance to and instruct category I personnel.



### Category III

Personnel classified to category III require all the knowledge, experience and skills expected of personnel classified to categories I and II, and in addition shall at least:

- a) be able to design, direct and establish routine condition monitoring programmes and non-routine investigations for the purpose of fault diagnosis;
- b) be able to specify the appropriate vibration instrumentation hardware, software, and processing for portable monitoring systems, permanently installed surveillance systems, and equipment protection systems
- c) have an in-depth knowledge of the principles and techniques of machinery VA and be able to make initial diagnoses of suspected faults beyond the range of commonly encountered issues. This should include, but not be limited to, the use of frequency spectra, time waveforms and orbits, transfer functions, basic operating deflection shapes, and acceleration enveloping under both steady state and transient conditions with or without a phase trigger;
- d) be able to manage such condition-monitoring programs, evaluate the alarm sets, write working procedures and specify vibration acceptance testing procedures;
- e) be able to initiate and validate machinery corrective actions including in situ two-plane rigid rotor balancing;
- f) be able to recommend restrictions to machine operation;
- g) be able to understand and direct, when necessary, alternative condition monitoring technologies to verify or investigate issues raised through routine data collection;
- h) be able to provide technical guidance to and instruct category I and II personnel, and, subject to agreement with the employer or client, deem them competent to carry out certain duties which would normally be outside the scope of those competencies.
- i) It is the responsibility of the employer or client to ensure that category III personnel have the necessary competency in the required management skills, e.g. creating budgets, preparing cost justifications, and managing personnel development.

### Confidentiality

Zenco will not use or sell your personal information in any way. If an employer or potential employer wishes to confirm your certification status, we will provide that information to them. Zenco is an ethically run organization. We place great importance on confidentiality and on the integrity of our exams and our processes. We believe in continuous improvement and we do our best to follow applicable guidelines and ethical norms. We expect the same from our students and our representatives around the world.