
**Health informatics — Medical
waveform format —**

**Part 4:
Stress test electrocardiography**

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Foreword

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Introduction

0.1 General

Stress test electrocardiography is an examination that is frequently used. It is used to check the changes in biological phenomena such as electrocardiogram or blood pressure that occur during cardiac stress. Cardiac stress can be seen via exercise or by intravenous pharmacological stimulation. The purpose of this examination is to find cardiac abnormalities, such as myocardial ischemia disease or arrhythmia during exertion, and to check the athletic capability of the cardiopulmonary function.

This document defines the detailed rules of stress test electrocardiogram waveform format that is encoded according to the Medical waveform Format Encoding Rules (MFER). In addition to basic rules defined in ISO 22077-1, there are rules for ECG waveforms electrocardiography (12lead ECG, etc.) and long-term electrocardiography (Holter ECG) that are contained in other MFER technical specifications, i.e. ISO/TS 22077-2 and ISO/TS 22077-3. Please refer to those specifications for additional information.

0.2 Information package added to the electrocardiogram

The stress test checks the changes in the electrocardiogram during exercise against the resting electrocardiogram. To correctly interpret the changes, we also need to capture other waveforms such as the blood pressure, respiration gas, SpO₂ and the load information. These should be put into a single package to be delivered to a third party such as a healthcare provider.

The purpose of this document is to describe waveforms of different nature in the package and how they can be synchronized in order to be interpreted simultaneously by the recipient of the package.

0.3 About electrocardiography waveform encoding in MFER

It is recommended to store the original waveforms as much as possible, i.e. waveforms are not irreversible compressed or filtered. This is to avoid losing the information contained in the original waveform when reusing the waveform in research, etc. It is desirable to perform the processing (e.g., Synthesized lead or filtering) needed for encoded waveforms. The configuration and condition of an electrocardiogram recording may be encoded with waveform data to assure reproduction of electrocardiographic representation when using a system such as electronic medical records. However, it is entrusted to the system whether those can or cannot be reproduced using this information. There are often large drift noises and EMGs on electrocardiograms during exercise stress tests. Some devices perform special signal processing to remove these noises. And the system might not be able to perform the same signal processing to reproduce the electrocardiogram that was recorded. In such a case, in addition to the original waveform, storing the waveform after signal processing is also an option.