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Condition monitoring and diagnostics of machines — Ultrasound —

Part 2: Procedures and validation

*Surveillance des conditions et diagnostic d'état des machines —
Ultrasons —*

Partie 2: Modes opératoires et validation



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Foreword

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The committee responsible for this document is ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 5, *Condition monitoring and diagnostics of machine systems*.

ISO 29821 consists of the following parts, under the general title *Condition monitoring and diagnostics of machines — Ultrasound*:

- *Part 1: General guidelines*
- *Part 2: Procedures and validation*

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Introduction

This part of ISO 29821 provides specific guidance on the interpretation of ultrasonic readings and wave files or frequency and time domain printouts (sometimes called “sound images”) as part of a programme for condition monitoring and diagnostics of machines. Airborne (AB) and structure-borne (SB) ultrasound can be used to detect abnormal performance or machine anomalies. The anomalies are detected as high frequency acoustic events caused by turbulent flow, ionization events and friction, which are caused, in turn, by incorrect machinery operation, leaks, improper lubrication, worn components, and/or electrical discharges.

Airborne and structure-borne ultrasound is based on measuring the high frequency sound that is generated by either turbulent flow, friction or by the ionization created from the anomalies. The inspector therefore requires an understanding of ultrasound and how it propagates through the atmosphere and through structures as a prerequisite to the creation of an airborne and structure-borne ultrasound programme. Ultrasonic energy is present with the operation of all machines. It can be in the form of friction, turbulent flow and/or ionization as a property of the process, or produced by the process itself. As a result, ultrasonic emissions are created and these are an ideal parameter for monitoring the performance of machines, the condition of machines, and for diagnosing machine anomalies. Ultrasound is an ideal technology to do this monitoring because it provides an efficient way to quickly and non-invasively determine the location of an anomaly with little setup and in a very short period of time.