
Fatigue test method for transmission precision roller chains and leaf chains

*Méthode d'essai de fatigue pour chaînes de transmission de précision
à rouleaux et chaînes de levage à mailles jointives*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 100, *Chains and chain sprockets for power transmission and conveyors*.

This second edition cancels and replaces the first edition (ISO 15654:2004), which has been technically revised.

Fatigue test method for transmission precision roller chains and leaf chains

1 Scope

This International Standard specifies an axial force fatigue test method for transmission roller chains and leaf chains. The tests being of the fluctuating tension type, carried out at room temperature in air, with the force applied along the longitudinal axis of the chain. It also specifies procedures for statistically analysing the test results and gives formats and elements for presenting the results of fatigue tests and analyses.

2 Normative references

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

ISO 606, *Short-pitch transmission precision roller and bush chains, attachments and associated chain sprockets*

ISO 4347:2015, *Leaf chains, clevises and sheaves — Dimensions, measuring forces, tensile strengths and dynamic strengths*

ISO 10190, *Motorcycle chains — Characteristics and test methods*

3 Symbols

Symbol	Description	Unit
d	Step size — the interval between adjacent force levels in a staircase test [see Formula (5)]	N
F_{\max}	Maximum force — maximum value of force in the cycle	N
F_{\min}	Minimum force — minimum value of force in the cycle	N
F_m	Mean force — half the sum of the maximum and minimum forces in the force cycle [see Formula (1)]	N
F_a	Force amplitude — half the difference between the maximum force and minimum force [see Formula (2)]	N
F_b	Mean Fatigue Strength — the test force, corrected to zero minimum force, at which there is a 50 % probability of failure at endurance [see Formula (8)]	N
F_{dx}	Fatigue limit — the test force, corrected to zero minimum force, at which there is a calculated 0,135 % probability of failure at 10^7 force cycles. This approximates the force below which a chain can endure an infinite number of force cycles [see Formula (10)]	N
F_d	Test force — the maximum force, corrected to zero minimum force, at which a test was run [see Formula (3)]	N
F_u	Minimum UTS — the minimum tensile strength of chain as specified in ISO 606, ISO 10190 or ISO 4347	N
N	Cycles — the number of cycles, at a given alternating force, applied to a specimen chain at a particular time in the test	—