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**Metallic materials — Sheet and strip  
— Earing test**

*Matériaux métalliques — Tôles et bandes — Essai de corne*



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## Foreword

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The committee responsible for this document is ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

This second edition cancels and replaces the first edition (ISO 11531:1994), of which it constitutes a minor revision.

# Metallic materials — Sheet and strip — Earing test

## 1 Scope

This International Standard specifies a method for determining the ear height of metal sheet and strip of nominal thickness from 0,1 mm to 3 mm after deep drawing.

## 2 Symbols and their meanings

The meanings of the symbols used in the earing test are given in [Table 1](#) and illustrated in [Figures 1](#) and [2](#).

**Table 1 — Symbols**

Symbol	Meaning	Units
$a$	Thickness of test piece	mm
$d_1$	Diameter of punch	mm
$R_1$	Corner radius of punch	mm
$d_2$	Inside diameter of die	mm
$R_2$	Inside corner radius of die	mm
$d_b$	Diameter of circular blank	mm
$h_t$	Distance between outside bottom of cup and any ear peak	mm
$h_v$	Distance between outside bottom of cup and any ear valley	mm
$h_{t,max}$	Maximum value of $h_t$	mm
$h_{v,min}$	Minimum value of $h_v$	mm
$\bar{h}_t$	Mean value of $h_t$	mm
$\bar{h}_v$	Mean value of $h_v$	mm
$\bar{h}_e$	Mean ear height	mm
$h_{e,max}$	Maximum ear height	mm
$N_{\text{ear peaks}}$	Number of ear peaks	—
$N_{\text{ear valleys}}$	Number of ear valleys	—
$Z$	Ear height expressed as a percentage	%
$R_a$	Surface roughness parameter: arithmetic mean deviation of profile	µm