

Title
Titolo Drop test on n° 3 wristwatches model UT1.

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Reference Standards and Procedures

Norme e procedure di riferimento

Test procedure 2022TP001 in accordance with MIL STD 810 H Proc IV "Transit drop", table 516.8 IX


Test aim

Scopo della prova

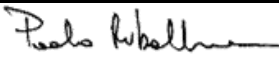
Verify the capability of the UUT to withstand the shock due to accidental fall in urban environment

Approval signatures

Firme per approvazione

Written by 
Scritto da
Date July 22nd, 2024
Data:

Facility technician Chiara Broggi
Tecnico di laboratorio

Approved by 
Approvato da
Date July 22nd, 2024
Data:

Facility manager Paolo Ribaldone
Responsabile laboratorio

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Unit Under Test (UUT)

Unità In Prova (UIP)

Name Nome	Unimatic wristwatch	Part number Codice Prodotto	TEST UNIT UT1
Quantity Quantità	3	Serial number Numero di serie	ID #1, #2, #3
Dimensions Dimensioni		Declared weight Peso dichiarato	



Figure 1 – UUTs identification.

Performed Tests List

Elenco prove eseguite

UUT receiving date Data ricevimento UIP	July 11 th , 2024
Tests start date Data inizio prove	July 11 th , 2024
Tests end date Data fine prove	July 11 th , 2024

Name ¹ Nome ¹	page pag.	Axis ² Asse ²	Type Tipo	Duration Durata	Description Descrizione	Result ³ Esito ³
Test n° 1	5	n.a.	Drop test	26 drops	Height 1,22 mt	OK

¹ Tests were numbered according to the chronological sequence.

Le prove sono state numerate secondo l'ordine cronologico di esecuzione.

² Test axes are defined by the Customer and are shown in figures showing the mounting in the corresponding tests.

Gli assi di prova sono definiti dal Cliente e sono indicati nelle figure di montaggio delle relative prove.

³ Functional tests and structural integrity checks are responsibility and competence of the Customer.

I controlli funzionali e di integrità strutturale sull'unità sono di responsabilità e competenza del Cliente.

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List of abbreviations

Lista delle abbreviazioni

1 G = 9,81 m/s²

UIP = Unità In Prova

UUT = Unit under test

PSD = Densità Spettrale di Potenza [Power Spectral Density]

Test n° 1

Test date Data di esecuzione della prova	jul 11, 2024 15:15:26
Test type Tipo di prova	drop test
Test axis Asse di prova	n.a.
Test profile Profilo di prova	

Witnesses to the test

Presenti alla prova

Ms. Parvoulova (Unimatic), Mr. Petrucci and Mr. Ferrari (Unimatic); Ms. C. Broggi and Mr. Venturino (BPS)

Test setup

setup di prova

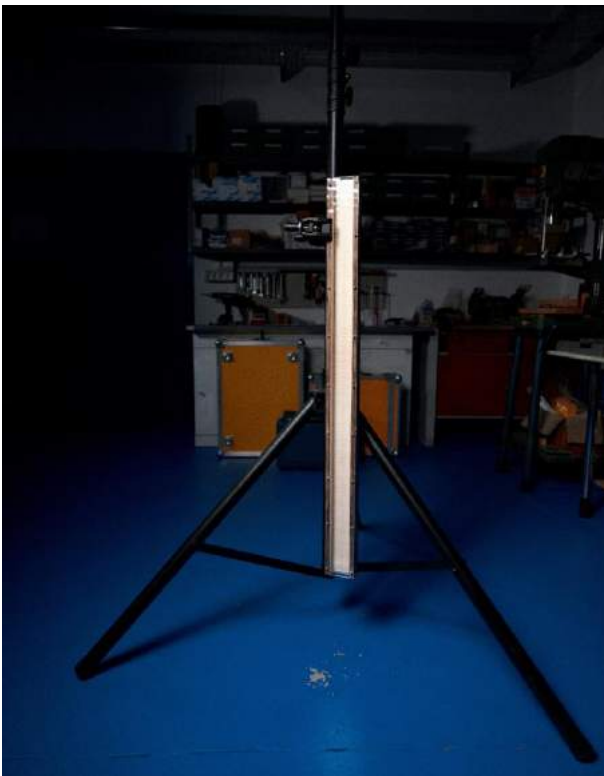


Figure 2 – Test area and equipment.

The graduated guide was used to perform the impacts on corners and lateral surfaces, in order to avoid unwanted rotations of the watch during the free fall.

As stated by the Reference Standard, the guide avoids rotation while in the same time allowing for an unrestricted free fall of the UUT.

The guide was 1 mt long, so that the last 22 cm of fall remained completely free from obstacles that could accidentally hinder any bounces of the UUT.

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Test parameters

Parametri di test

The drop test were performed according to the parameters reported in the Reference standard and summarized in the following table:

Height	1,22 m
Impact surface	Industrial concrete
Drops	26 (one for each surface, corner and edge)
UUTs	3

Table 1 – Test parameters.

The UUTs surfaces, edges and corners were identified according to the following figure:

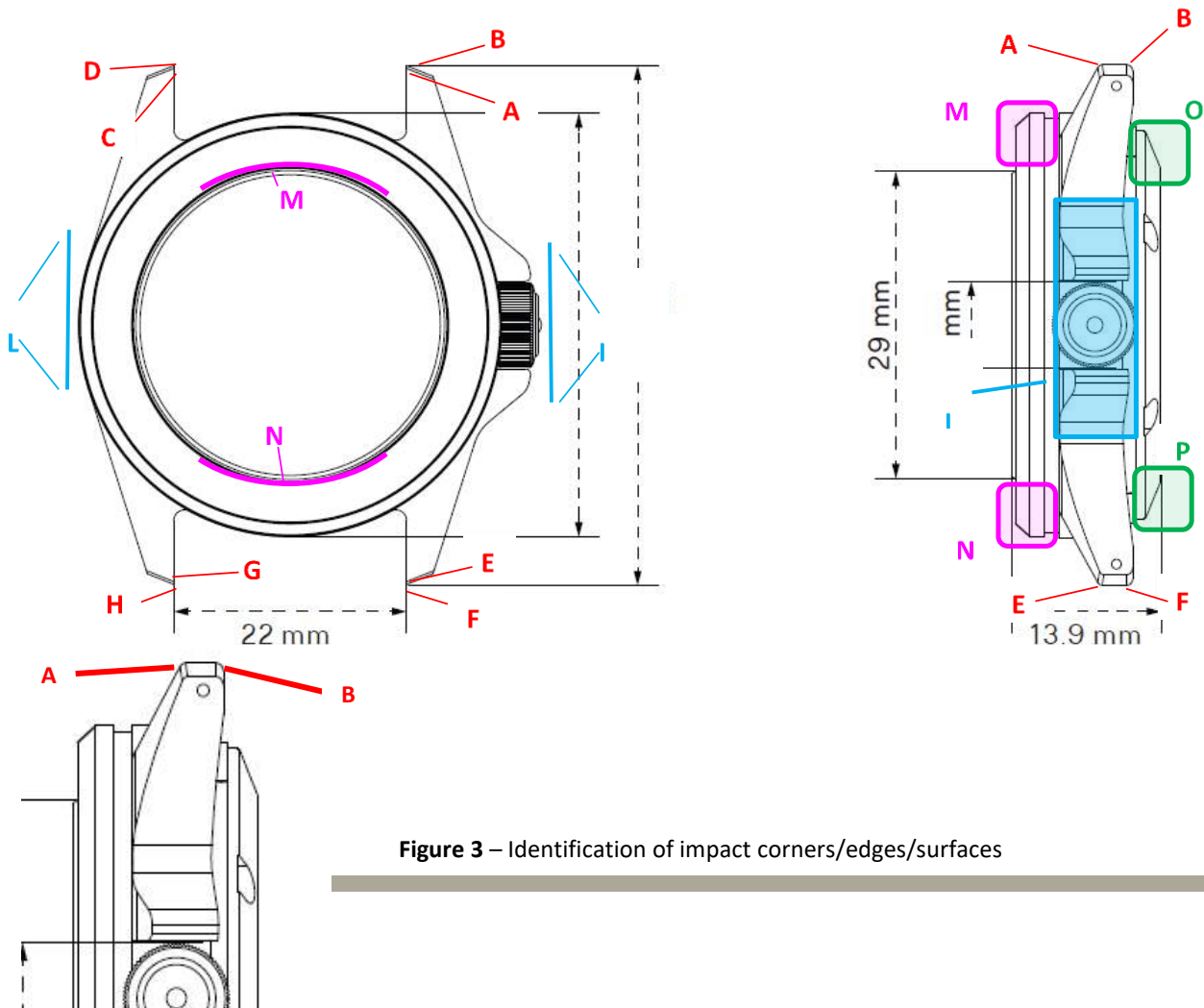


Figure 3 – Identification of impact corners/edges/surfaces

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Test execution

Esecuzione del test

Each UUT was subjected to a minimum of 8 drops, according to the following table:

UUT identification	Impact corner (C)/edge (E)/surface (S)	drops
Unit 1	(S) watch face (S) watch case (C) A (C) B (C) C (C) D (E) AE (E) FB	8
Unit 2	(C) E (C) F (C) G (C) H (S) AEFB face (S) CDHG face (S) ABCD face (S) EFGH face (E) CG	9
Unit 3	(E) EF (E) AB (E) CD (E) GH (E) AC (E) GE (E) BD (E) FH (E) DH	9

Table 2 – Drops performed.

The drop tests were documented by means of photos and videos taken on behalf of Unimatic respectively by Mr. Ferrari and Mr. Petrucci.

The videos were recorded with a Red Komodo 6K camcorder.

Results

Risultati

The drop tests caused the detachment of the bezel insert both for unit 1 and 2. The detachment occurred after the first drop for unit 1 (impact on watch face surface) and after the third drop for unit 2 (impact on G corner). The damage was limited to the insert and did not affect the bezel, which was still working as expected.



Figure 4 – Bezel insert detached.

Minor dents were found on the case (see figures below), no damage at all was found on the watch crystal.



Figure 5 – Example of dents caused by the impacts

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After the impacts all the 3 UUT were functioning. More thorough functional and integrity checks were performed by the Customer, and no malfunctioning or damage was found in any of the UUTs. **Functional tests and structural integrity checks are responsibility and competence of the Customer.**

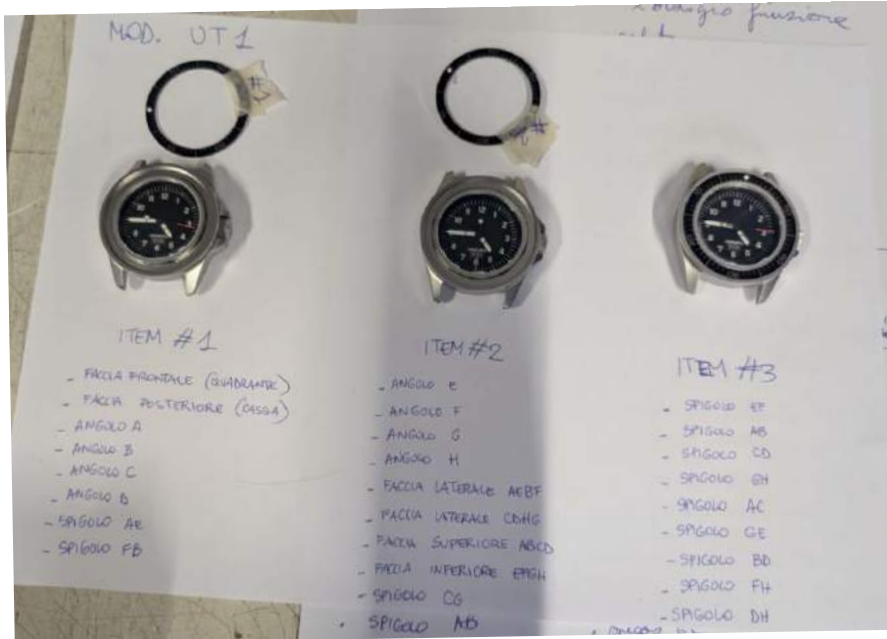


Figure 6 – UUTs after the drop test

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