

TEST REPORT No. 425673

Customer

IRONLEV ONE S.r.l.

Via Luigi Galvani, 6/A - 31027 SPRESIANO (TV) - Italy

Item#

**carriage for sliding doors and windows named
“WD Medium - Exterior (codice prodotto: WD370)”**

Activity

**partial characterisation according to standard
UNI EN 13126-15:2019**

Results

H3##	050	/###	-	1
1 st	2 nd	3 rd	4 th	5 th

(##) Upon customer's request, the product was subjected to 100000 cycles (80000 cycles more than the maximum H3 class required by UNI EN 13126-15:2019), at the end of which it met all the requirements of the reference standard.

(###) Test not performed during this testing session.

(#) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 11 February 2025

Chief Executive Officer

Order:
103817

Item origin:
sampled and supplied by the customer

Identification of item received:
2024/3795 dated 11 December 2024

Activity date:
from 17 December 2024 to 29 January 2025

Activity site:
Istituto Giordano S.p.A. - Strada Erbosa Uno, 72 -
47043 Gatteo (FC) - Italy
Istituto Giordano S.p.A. - Blocco 4 - Via San Mauro,
8 - 47814 Bellaria-Igea Marina (RN) - Italy

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The results relate only to the item examined, as received, and are valid only in the conditions in which the activity was carried out.

This document is the English translation of the test report No. 425673 issued in Italian; in case of dispute the only valid version is the Italian one.

Date of translation: 19 February 2025.

The original of this document consists of an electronic document digitally signed pursuant to the applicable Italian Legislation.

Chief Test Technician:

Ing. Chiara Bastoni

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Dott. Andrea Bruschi

Compiler: Dott. Marina Bonito

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Description of the item[#]

The item under examination consists of 3 examples of a carriage for a magnetic levitation sliding system with a single-ribbed track. Each carriage has 4 rollers.

Further details of item characteristics in annex "A".



Item photographs

Normative references

Standard	Title
UNI EN 13126-15:2019	Accessori per serramenti - Requisiti e metodi di prova per finestre e porte finestre - Parte 15: Carrelli e rulli per scorrevoli e aperture a libro o a fisarmonica (<i>Building hardware - Requirements and test methods for windows and balcony doors - Part 15: Carriages and rollers for sliding and folding or accordion openings</i>)

Apparatus

Description	Internal identification code
electro-pneumatic apparatus for the operating cycle, complete with PLC and cycle counter	//
10 kg, 5 kg, 3 kg, 2 kg and 1 kg calibrated masses	//
BORLETTI "CDEP15" digital calliper gauge, range 0÷150 mm and resolution 0,01 mm	EDI066

(*) according to that stated by the customer; Istituto Giordano declines all responsibility for the information and data provided by the customer that may influence the results.

Method

Normative reference	Activity	Description
clause 7.3.1 of standard UNI EN 13126-15:2019	durability test	Two coupled rollers were used to perform the cyclic test with greater stability. Carriages tested: #1 and #2. Before and after cycles, as defined by the standard, were measured: - the distance from the top base of the carriage to the top base of the "D" rail; - The diameter of each roller is at 3 different points (the table shows the average of the 3 measurements indicated by the symbol "ϕ" accompanied by two subscripts; the first indicates the carriage and the second the roller). For classification and requirements, reference was made to clause 5.2.2 of the standard UNI EN 13126-15:2019.
//	proof of durability beyond the requirements of the standard	Upon customer's request, the product was subjected to additional 80000 cycles compared to the 20000 required by the maximum class H3 according to standard UNI EN 13126-15:2019.
clause 7.5.1 of standard UNI EN 13126-15:2019	static resistance test at room temperature	For classification and requirements, reference was made to clause 5.4 of standard UNI EN 13126-15:2019.

Environmental conditions

Temperature	(19 ± 3) °C
Relative humidity	(55 ± 10) %

Results

Durability

Cycles performed [#]		Lubri- cation	Ad- just- ment	Distance ^{##} "D"	Average of 3 roller diameter measurements at 3 different points							
					carriage #1				carriage #2			
					roll 1	roll 2	roll 3	roll 4	roll 1	roll 2	roll 3	roll 4
					ϕ_{11} [mm]	ϕ_{12} [mm]	ϕ_{13} [mm]	ϕ_{14} [mm]	ϕ_{21} [mm]	ϕ_{22} [mm]	ϕ_{23} [mm]	ϕ_{24} [mm]
0	0	//	//	18,6	15,9	15,9	15,9	15,9	15,9	15,9	15,9	15,9
20000	20	no	no	18,4	15,8	15,8	15,8	15,9	15,9	15,9	15,9	15,9
100000	100	no	no	18,4	15,8	15,8	15,8	15,9	15,9	15,8	15,9	15,8
At the end of the cycles, wear of the rollers and Teflon spacers (0,24 mm deep) was found. The initial size of Teflon spacers was 11 mm, so the variation is <5 %.												

([#]) Upon customer's request, the product was subjected to 100000 cycles (80000 more than the 20000 required for the maximum class H3 according to UNI EN 13126-15:2019); the measurements at the classification limit and the final measurements are shown.

(^{##}) from the upper base of the carriage to the upper base of the rail.



Photographs of the item during the durability test



Photographs at the end of the test

Static load at ambient temperature

Load applied [kg]	Hours of application of the load [h]	Measures		Permitted variations
		D ₀ [mm]	D ₂₄₀ [mm]	
50	240	15,9	15,9	< 5%

Note: At the end of the test there is a slight imprint on the Teflon spacers, depth 0,03 mm, due to the pressure on the guide. The initial size of Teflon spacers was 18,5 mm, so the variation is <5 %.

Findings

Based on the results obtained, the item under examination can be classified according to clause 4 of standard UNI EN 13126-15:2019 with the following 5-character coding system:

H3[#]	050	4^{##}	-	1
1st	2nd	3rd	4th	5th

The digits signify what is indicated in the table below.

Digit	Characteristic	Possible values
1st	Durability	- class H1 5000 cycles - class H2 10000 cycles - class H3 20000 cycles
2nd	Mass	The figure indicates the maximum mass of the sash expressed in kg preceded by a 0. For N-type windows, the mass corresponds to the maximum load carried by 2 carriages.
3rd	Corrosion resistance	- class 0: no resistance or not determined; - class 1: 24 h; - class 2: 48 h; - class 3: 96 h; - class 4: 240 h; - class 5: 480 h.
4th	Test dimensions	No test size is required for N-type windows SRW 900 mm × SRH 1900 mm for window types Q, R and S
5th	Application	- class 1: for use on sliding windows and balcony doors (type N); - class 2: for use on folding or accordion sliding windows and balcony doors with central pivot pin (type Q); - class 3: for use on folding or accordion sliding windows and balcony doors with corner pivot pin (type R and/or S).

([#]) At the customer's request, the product was subjected to 100000 cycles (80000 cycles more than the maximum required by UNI EN 13126-15:2019 for H3 class), at the end of which it met all the requirements of the reference standard.

(^{##}) Test not performed during this testing session.

The classification was determined on the basis of values obtained via experimental measurement/calculation without considering the measure uncertainties, in line with clause 4.2.1 "Binary Statement for Simple Acceptance Rule ($w = 0$)" of guide ILAC-G8:09/2019 "Guidelines on Decision Rules and Statements of Conformity", having satisfied the requirements on measurements and equipment defined in the reference standards.

**ANNEX “A”
TO TEST REPORT No. 425673**

Customer

IRONLEV ONE S.r.l.

Via Luigi Galvani, 6/A - 31027 SPRESIANO (TV) - Italy

Item#

**carriage for sliding doors and windows named
“WD Medium - Exterior (codice prodotto: WD370)”**

Contents

customer-supplied item technical documentation

Order:
103817

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ro, 8 - 47814 Bellaria-Igea Marina (RN) - Italy

(#) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 11 February 2025

This annex is made up of 6 pages.
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ironlev

WD Medium - Exterior

Descrizione

Il pattino a levitazione Ironlev® è un dispositivo che consente lo scorrimento lungo una dimensione longitudinale e il sostentamento magnetico di un carico in una direzione perpendicolare alla direzione di scorrimento. Il centraggio magnetico è ottenuto tramite mezzi meccanici di guida costituiti da cuscinetti di rotolamento, mentre l'interfaccia di applicazione del carico è costituita da una clip in materiale plastico disposta superiormente al pattino. Il rivestimento esterno consente la resistenza all'uso e agli agenti atmosferici. Ironlev WD Medium Slider è specificamente progettato per l'applicazione su finestre e porte scorrevoli da esterni. Inoltre, il pattino WD Medium è progettato per l'integrazione in sistemi alzanti scorrevoli. La tecnologia Ironlev consente a finestre e porte di grandi dimensioni ed estremamente pesanti di muoversi con una forza manuale minima in un ambiente privo di attrito, senza elettricità, come se fossero in assenza di gravità.

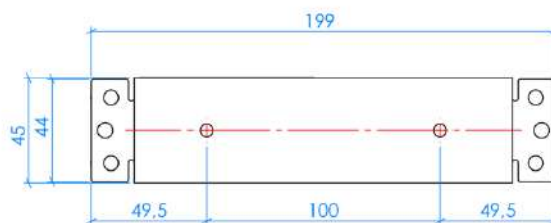
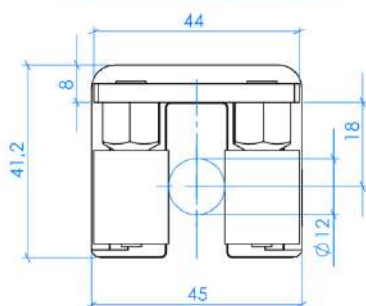


Ironlev

Dati tecnici

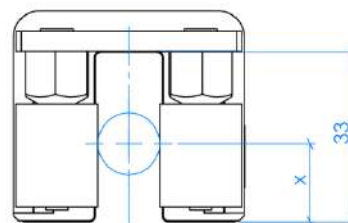
Produttore	Ironlev One Srl
Nome	WD Medium - Exterior
Marchio	Ironlev®
PN	WD370
Portata	50 kg
Dimensioni di ingombro (mm)	199x45x41,2
Diametro sezione rotaia (mm)	D 12

SECTION VIEW
50 Kg nominal position

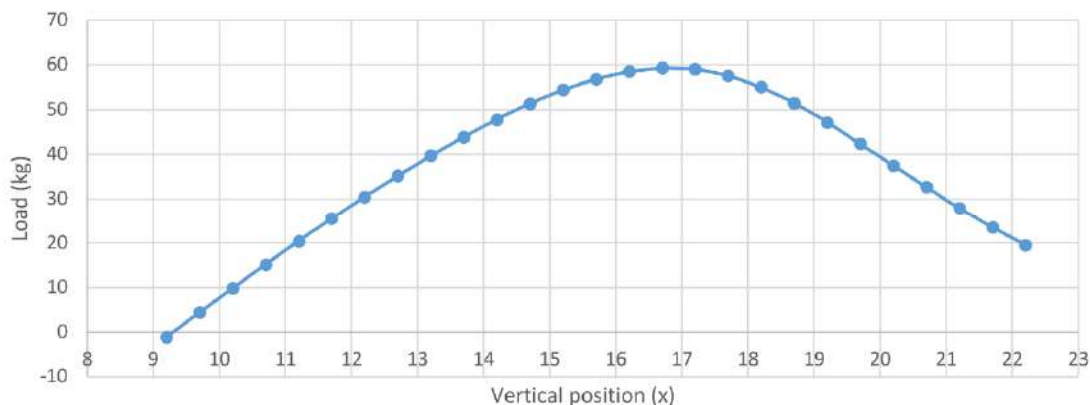


Il pattino a levitazione Ironlev ha un comportamento magnetico caratterizzato da una variazione della posizione verticale rispetto alla rotaia al variare del carico. Pertanto, è opportuno prendere in considerazione tale aspetto in fase di progettazione al fine di verificare lo scostamento tra posizione nominale e la posizione in condizione di funzionamento relativa al peso del serramento applicato.

Di seguito è presentato un grafico che rappresenta l'andamento della quota verticale X (vedi riferimento Figura) in funzione del carico applicato.



LOAD vs VERTICAL POSITION



Funzionamento come modulo scorrevole

Per un corretto funzionamento come sistema scorrevole (non alzante) si richiede di utilizzare il pattino in un range di carico tra 33 e 50 kg.

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Funzionamento come modulo alzante

Per un corretto funzionamento del pattino combinato ad un sistema alzante scorrevole, si richiede di applicare un numero di pattini in funzione del peso dell'anta come indicato nella tabella di seguito. In funzione del numero di pattini utilizzati e del peso dell'anta, è richiesto l'impiego di una ferramenta alzante scorrevole con le specifiche indicate di seguito.

Range carico – Peso anta (kg)		N° pattini	Carico massimo su ferramenta (kg)
Min	Max		
70	139	1	84
140	209	2	99
210	279	3	114
280	349	4	129
350	419	5	144
420	489	6	159
490	559	7	174
560	629	8	189
630	699	9	204
700	769	10	219
770	839	11	234
840	909	12	249
910	979	13	264
980	1049	14	279

Per taglie o dimensioni diverse da quanto riportato, contattare l'ufficio tecnico.

ATTENZIONE!

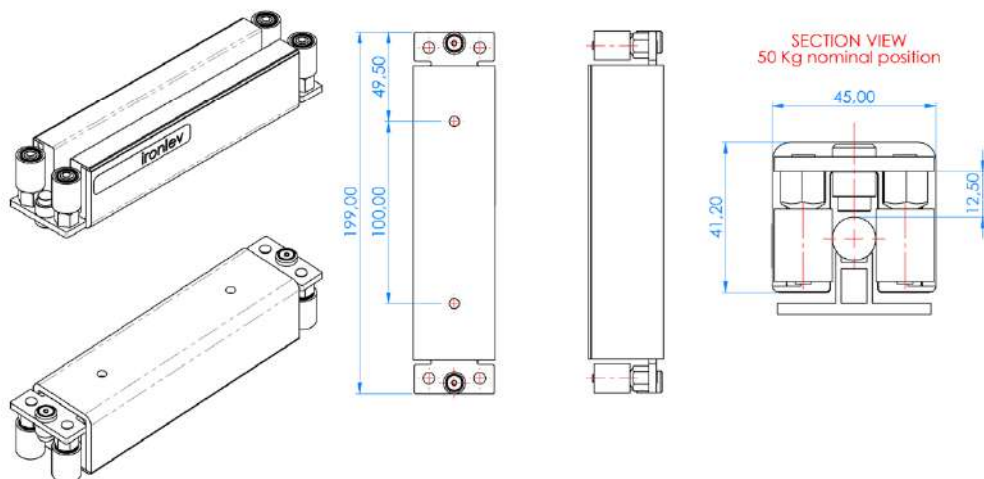
L'installatore è tenuto a rispettare i parametri di peso delle ante e utilizzare una ferramenta idonea. Non superare la portata massima indicata. Il fabbricante del pattino non risponde di eventuali danni ad oggetti o persone in caso di installazione non conforme.

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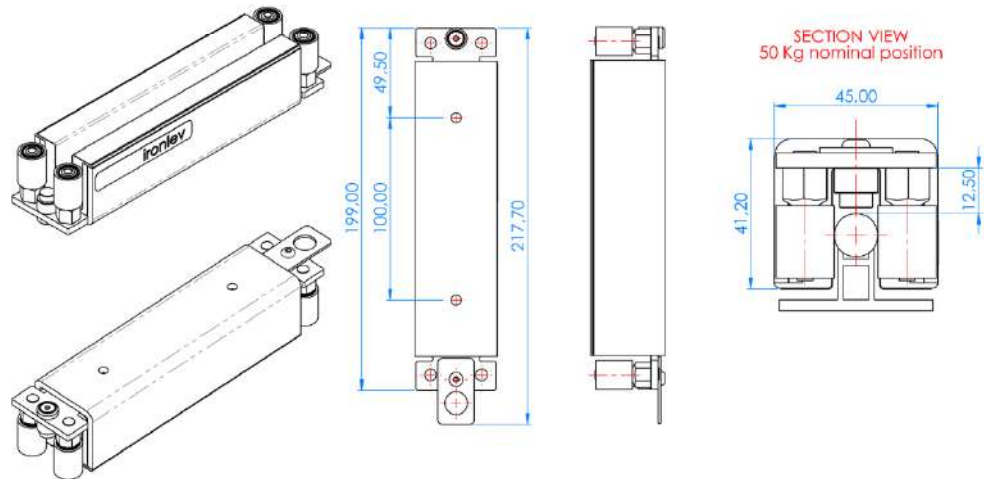
Configurazioni moduli

Il sistema è disponibile nelle seguenti configurazioni in funzione dell'applicazione d'uso richiesta. Nello specifico, il sistema può essere usato per un serramento scorrevole non alzante o in alternativa può essere accoppiato ad un sistema alzante scorrevole. Per sistemi puramente scorrevoli si richiede l'uso dei moduli Sliding, mentre per i sistemi alzanti scorrevoli si richiede l'uso dei moduli L&S.

Sliding module



Sliding module - with connection

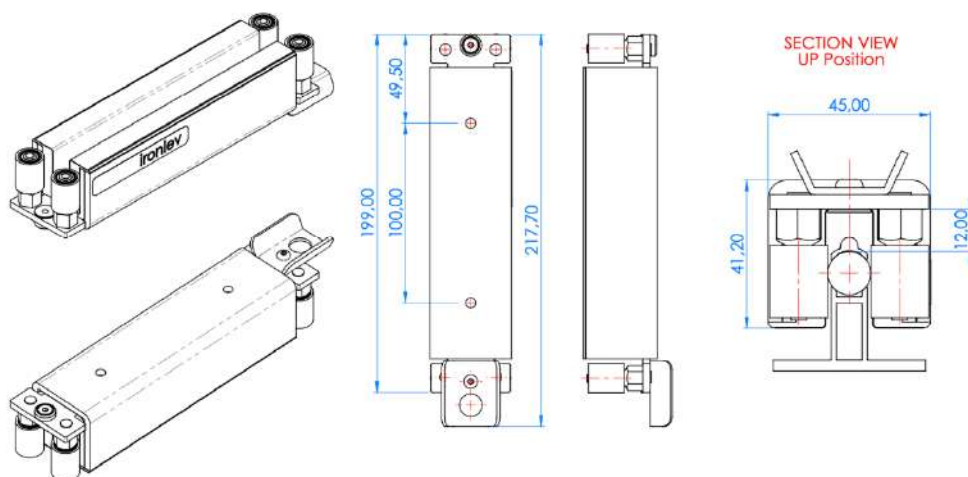


Size	Module	Weight		Rail	Load		Linear Load Capacity		Pitch
		Slider			Max net load		Max Linear Load		
		kg	lb	kg/m	kg	lb	kg/m	lb/ft	mm
WD Medium - Exterior	Sliding	1.55	3.42	0.9	50	110	250	168	200

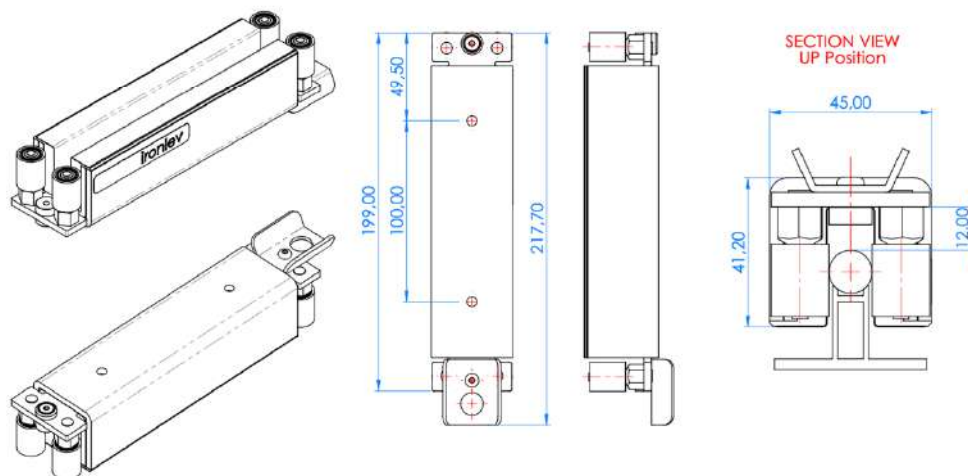
La sospensione magnetica consente l'adozione di molteplici pattini allineati sui quali il peso si distribuisce equamente. Per ottenere la massima portata lineare del sistema i pattini possono essere disposti in fila e il passo può essere ridotto fino al valore minimo corrispondente alla condizione di aggancio tra i moduli (utilizzando le rispettive connessioni o mediante altro collegamento), come indicato nel presente manuale.

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L&S module for top rail



L&S module for round rail



Size	Module	Weight		Pitch	
		Slider	Rail	Min Pitch	
		kg	lb	kg/m	mm
WD Medium - Exterior	L&S	1.55	3.42	0.9	200

La sospensione magnetica consente l'adozione di molteplici pattini allineati sui quali il peso si distribuisce equamente. Il numero di pattini da utilizzare è funzione del peso dell'anta (vedi tabella capitolo precedente) e nel caso di ante di lunghezza ridotta il passo può essere diminuito fino al valore minimo corrispondente alla condizione di aggancio tra i moduli, come indicato nel presente manuale.