

Von Frey Hairs Aesthesiometer

Set of 20 filaments

User Guide

SKU 37450-275 - Rev. 2.0 - May 2024



ugobasile.com



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TRANSFORMING IDEAS
INTO INSTRUMENTS

SAFETY CONSIDERATIONS

Although this instrument has been designed with international safety standards, it contains information, cautions and warnings which must be followed to ensure safe operation and to retain the instrument in safe conditions.

Service and adjustments should be carried out by qualified personnel, authorized by Ugo Basile organization.

Any adjustment, maintenance and repair of the powered instrument should be avoided as much as possible and, when inevitable, should be carried out by a skilled person who is aware of the hazard involved.

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

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1. What's in the box

Set of 20 monofilaments (target force in grams from 0.008 to 300) based on the Semmes Weinstein monofilament set, with hard printed User Guide and carrying case.

Available and useful accessories (See Chapter 4)

SKU	Description
37450-278	Base assembly for plantar stimulation, including support with columns (26,5 cm high), perforated metal sheet and multiple configuration animal enclosure, from 3 to 12 spaces.
37450-045	Large perforated metal sheet, with 4 legs, 40cm height (animal enclosure 37000-007 is not included and should be ordered separately).
37450-085	Large perforated metal sheet, with 4 legs, 80cm height (animal enclosure 37000-007 is not included and should be ordered separately).

For mechanical stimulation tests, see also the other products from Ugo Basile:

SKU	Description
37550	Dynamic Plantar Aesthesiometer: the quickest and most accurate way of delivering a mechanical stimulation and measuring a response, all automatically. The force, which is automatically applied by the instrument, at the rate and intensity the operator sets and paw withdrawal automatically scored.
38450	Electronic Von Frey: a new device, whose advantage over the classic manual Von Frey filaments is the user-controlled application of force rate, quicker and more consistent, thanks to the new Rate-meter and Slope features.

2. General

Von Frey hairs from Ugo Basile are nylon made, in order to keep their force calibration, otherwise influenced by humidity.

The diameter of the filament determines the resistance of the monofilament to bending and hence, when it is placed perpendicularly to the skin with slowly increasing force until it bends, this also determines the amount of force applied (see table at page 11 "*5. Tactile Sensory Evaluator Data Chart*").

The set of 20 monofilaments now features retractable probe to protect the filament and allow the evaluator to carry a few around in a pocket.

Von Frey monofilaments have a long history of effective use in clinical settings and can be used to diagnose pathologies of hyper- or hypoesthesia in both animals and humans.

Von Frey hairs (named after the German physiologist Max Von Frey, 1852–1932) were originally produced from animal and human hairs of different diameter; nowadays they are nylon monofilaments of different diameters, each of them mounted at right angle to the end of a plastic handle.

The diameter determines the resistance of the monofilament to bending; a filament is placed perpendicularly to the skin with slowly increasing force until it bends, thereby determining the amount of force applied.

The new design of the filaments features:

Color-coded sleeves and numbered filament heads



Rotating sleeve which protects precision filament while in closed position.

Closed position locks and prevents head from accidentally opening or damaging filament.



Rotated sleeve provides mechanical stability to the pivoting filament head.



The monofilaments provides an increasing scale of actual force and perceived touch intensity, thus providing a non-invasive evaluation of cutaneous sensation levels; results are repeatable and objective.

Each filament is calibrated such that, when properly applied, the filament delivers the target force within 5% standard deviation.

3. Principle of operation

One of the most popular non-invasive techniques used with a long history, but the operating principle remains the same.

When the tip of a fiber of given length and diameter is pressed against the skin at right angles, the force of application increases as long as the researcher continues to advance the probe, until the fiber bends.

After the fiber bends, continued advance creates more bend, but not more force of application.

3.1. Method of operation with rodents

Rodents exhibit a paw withdrawal reflex when the paw is unexpectedly touched. The glabrous skin of the hind paw of the rodent is the most common target site for tests using rodents as the model organism for experimentation with Semmes Weinstein Von Frey filaments.

The Ugo Basile Von Frey can be used on the Plantar surface of the foot of a rat or mouse, and the animal will indicate sensation by pulling back its paw.

Robust, repeatable data regarding paw withdrawal can be achieved using several experimental paradigms. Often, the test subject is cradled, held by the scruff of the neck or more appropriately on a freely moving animal (see 37000-007 animal enclosures).

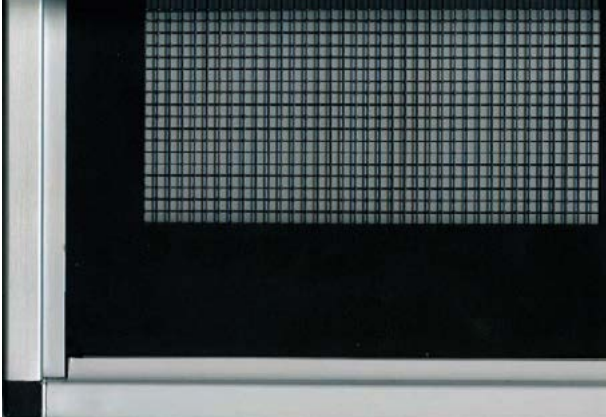
The test subject may be placed within a small cubicle on the top of a perforated platform or shelf, see chapter *"Available and useful accessories"* at page 8.

The target area is visualized and the filament is pressed against the target site until the filament bows. The filament is held in place for 1-1.5 seconds, and then removed. Repeat three times per target area.

A flinch or flick of the paw constitutes a positive withdrawal and should be scored as such.

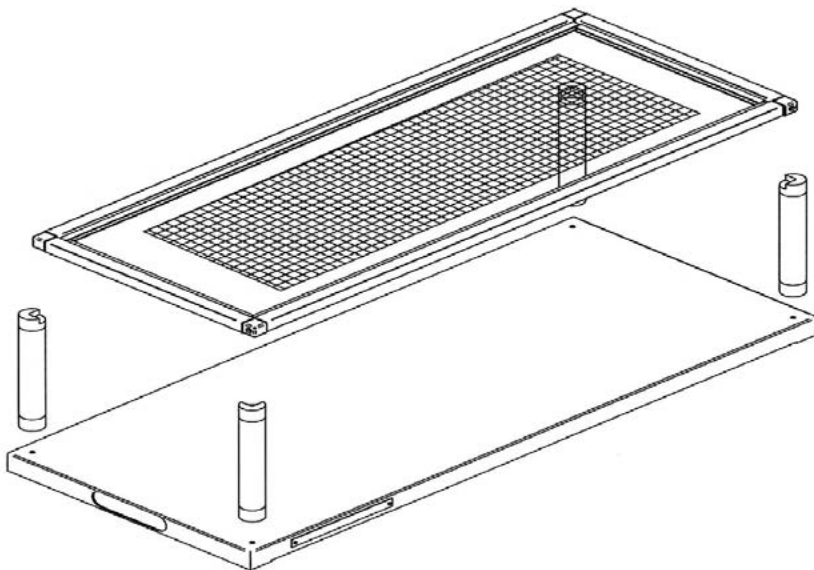
4. Available and useful accessories

A base assembly with perforated platform can be used to facilitate testing with Von Frey filaments. Laser-cut perforations form an open grid similar to a mesh of square holes approximately 5x5 mm in size. The intermediate metal grid is approximately 1 mm wide, comfortable for the animal, and facilitates viewing of the target area of the paw.



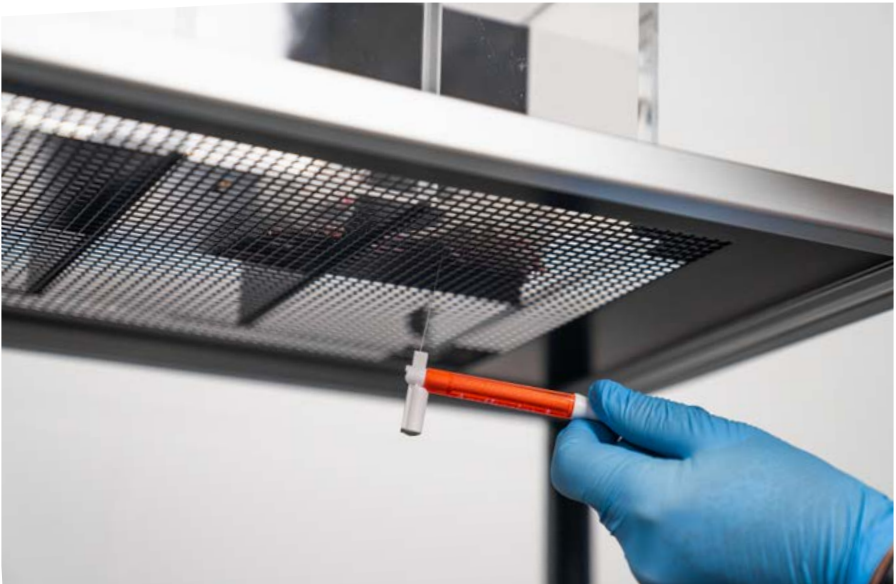
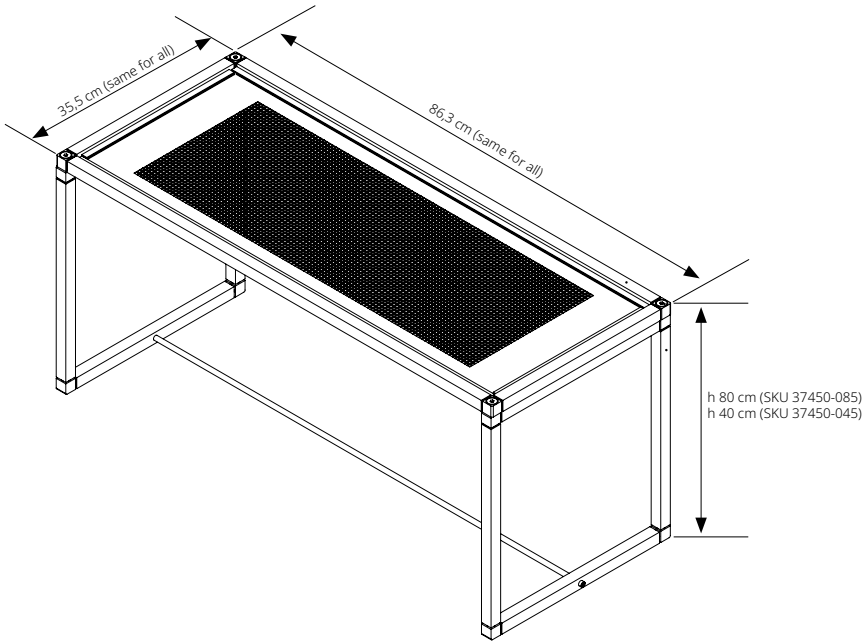
The shelf is coated with a polymer resin that is easy to clean and will not be damaged by fluids or waste materials.

The base assembly 37450-278 is 26,5 cm high and includes a multiple-configuration animal enclosure (37000-007).



The platform is also available as a freestanding model, in two different heights:

- 37450-045, 40 cm high
- 37450-085, 80 cm high



The animal enclosure 37000-007 is not included and should be ordered separately.

The 37000-007 is a modular enclosure of original design. Removable partitions enable dividing the enclosure into 3 animal cages for fat rats, 6 cages for rats and 12 cages for mice.

The enclosure is duly held in position on the framed glass pane by the spacers provided. Six separate lids make it easier to position/remove the rodents individually.

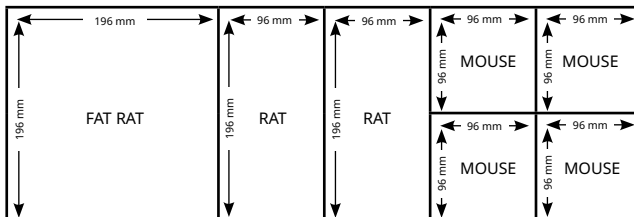
Modular Enclosure total dimensions:

- 20 cm x 62 cm x 14 cm.

Physical animal enclosure setup (internal dimensions):

- 12 modules (mice): 96mm x 96mm x 140 mm (h)
- 6 modules: 96mm x 196mm x 140 mm (h)
- 3 modules: 196mm x 196mm x 140 mm (h)

Graphical example of the measurements of the possible configurations of animal enclosures:



5. Tactile Sensory Evaluator Data Chart

Color	Filament size	Target force (grams)	Target force (mN)	Theoretical Pressure (Grams/Sq. mm)
Green	1.65	0.008	0.08	2.53
	2.36	0.02	0.2	4.39
	2.44	0.04	0.4	4.93
	2.83	0.07	0.7	5.53
Blue	3.22	0.16	1.6	8.77
	3.61	0.4	3.9	16.1
Purple	3.84	0.6	5.9	18.4
	4.08	1	9.8	24.4
	4.17	1.4	13.7	27.9
	4.31	2	19.6	27.4
Red	4.56	4	39.2	40.3
	4.74	6	58.8	52.6
	4.93	8	78.4	61.7
	5.07	10	98	68.3
	5.18	15	147	82
	5.46	26	255	106
	5.88	60	588	141
	6.10	100	980	193
	6.45	180	1760	222
	6.65	300	2940	292

6. Proper storage and handling

The Ugo Basile Von Frey Hairs are precision tactile sensory evaluators are precision instruments.

Care should be taken at all times to protect the integrity of the nylon filament.

A flip-cap protects tips; take care when opening and returning the cap to expose and retract the filament; there is a groove in the handle to accommodate the filament comfortably. When properly handled, the filaments can last quite a long time.

The filament may be cleaned with a mild instrument disinfectant (e.g. Isopropyl Alcohol or similar. Avoid chlorine-based disinfectants.) Make sure the monofilaments are thoroughly dry before reusing.

Substantially bent or kinked monofilaments must not be used for testing and should be discarded and replaced.

Store the evaluators at room temperature and humidity. Do not store in or expose to direct sunlight.

7. Bibliografy

Selection of papers mentioning Ugo Basile Von Frey Hairs

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- Y. Li, C. Yin, B. Liu, H. Nie, J. Wang, D. Zeng, R. Chen, X. He, J. Fang, J. Du, Y. Liang, Y. Jiang, J. Fang, B. Liu, 2021, "[Transcriptome profiling of long noncoding RNAs and mRNAs in spinal cord of a rat model of paclitaxel-induced peripheral neuropathy identifies potential mechanisms mediating neuroinflammation and pain](#)", Journal of Neuroinflammation
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- R. K. Rayiti, S. R. Munnangi, R. Bandarupalli, V. Chakka, S. L. Nimmagadda, L. S. Sk, S. Uppalapati, R. Bolla, and S. R. Challa, 2020, "[Effect of Chrysin on Mechanical Hyperalgesia in Chronic Constriction Injury-Induced Neuropathic Pain in Rat Model](#)", National Library of Medicine

8. Related Products

Estimates suggest that 20% of adults suffer from pain globally. Chronic pain is the most common cause of long-term disabilities.

Since 1963, Ugo Basile's devices have increasingly acquired a leading role in the field of pain and inflammation preclinical research, becoming precious tools for researchers to achieve their experimental objectives.



37550 - Dynamic Plantar Aesthesiometer - For Automated Mechanical Stimulation and Allodynia



38450 - Electronic Von Frey e-VF Handheld



38500 - PAM Pressure Application Measurement (for joint pain)



37215 - Analgesy-Meter Randall-Selitto paw-pressure test



31300 - Orofacial Stimulation Test (Fehrenbacher, Henry, Hargreaves method)



37560 - Tail Flick Unit - Thermal stimulation, D'Amour & Smith method



37300 - I.R. Heat-Flux Radiometer for Tail Flick and Plantar Test



37570 - Plantar Test for thermal stimulation - (Hargreaves Apparatus)



35530 - TGR 2 -Thermal preference phenotyping for tethered and non-tethered mice



35300 - Hot/Cold Plate NG for screening of thermal hyperalgesia/allodynia



35350 - Thermal Place Preference (TPP Test) for Mice & Rats



47885 - Librae Incapacitance Tester (Weight Bearing)



37240 - Plethysmometer - Paw Volume & Oedema



36103 - Climbing Test - Measures Vertical Activity in Rodents



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