Instruction manual

Set of 20 Von Frey Monofilaments

Revision 1.2

Pain
Inflammation

SKU: 37450-275

ugo basile®
TRANSFORMING IDEAS
INTO INSTRUMENTS

SAFETY CONSIDERATIONS

Although this instrument has been designed with international safety standard, this manual 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. If inevitable, it 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.

Contents

1 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 8).

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.

Subsets within the set of 20 probes distinguish pathologies on different parts of the body (foot, hand, lip, cheek, etc.) see paragraph 5-ORDERING INFORMATION.

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.

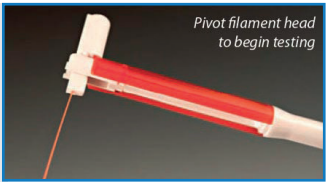
The diameter determines the resistance of the monofilament to bending; a filament is placed perpendicularly to the skin with slowly increasing force until it bends, thereby determining the amount of force applied.

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.

2 Operating principle

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.

2.1 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 paragraph 3-AVAILABLE ACCESSORIES.

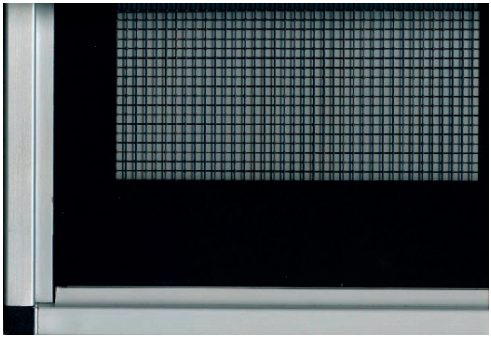
The target area is visualized and the filament is pressed against the target site until the filament bows. The filament is held in place for 1-1.5 seconds, and then removed. Repeat three times per target area.

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

3 Available and useful accessories

A perforated platform 37450-005, a 90x38cm shelf, is available as optional for testing with Von Frey filaments. Laser-cut perforations form a mesh-like open grid of square holes ~5X5 mm.

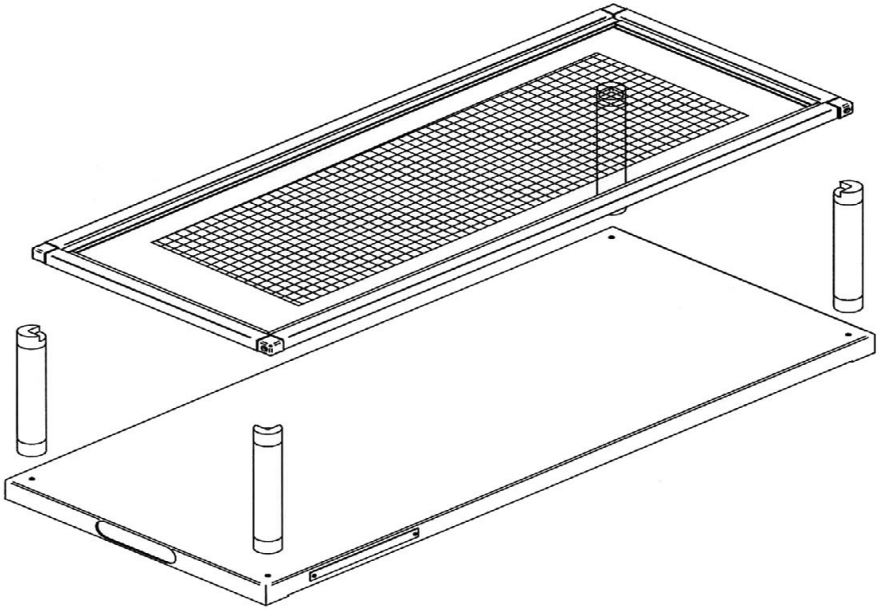
Intervening metal grid is ~1mm wide, comfortable to the animal and easy to view the target area of the paw.



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

Mount the shelf on the wall, or use the optional base & columns 37450-278 to hold the testing platform.

The 37450-278 kit also includes a multiple-configuration animal-enclosure, from 3 to 12 spaces. (From 6 rats to 12 mice)



The platform is also available as a self-supporting model, in two different heights:

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

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

The 37000-007 is a modular enclosure of original design, combining 3 animal cages: removable partitions enable dividing each of the 3 cages into 2 or 4 spaces, thus obtaining up to 12 spaces.

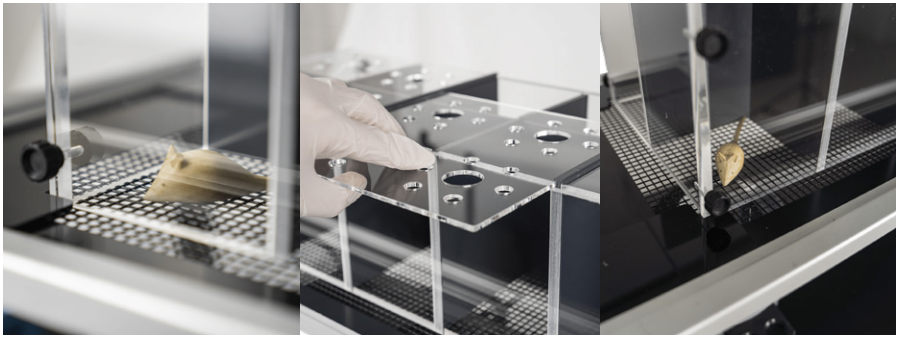
The enclosure is duly held in position on the framed glass pane by the spacers provided. Six separate lids make it easier to position/ remove the rodents individually.

Cage Dimensions:

- 20 cm x 62 cm x 14 cm.

Each of the 3 compartment is hence dimensioned

- 20 cm x 20 cm x 14 cm.



4 Tactile Sensory Evaluator Data Chart

Color	Evaluator 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

5 Ordering Information

37450-275	Von Frey Kit, Touch Test Sensory Evaluator, kit of 20 filaments
37450-275-5	Precise Tactile Sensory Evaluator Kit: Five Piece Kit (sizes: 2.83, 3.61, 4.31, 4.56 and 6.65) with Carrying case
37450-275-6	Precise Tactile Sensory Evaluator Kit: Six Piece Kit (sizes: 2.83, 3.61, 4.31, 4.56, 5.07 and 6.65) with Carrying case
37450-277	Set of 20 Von Frey Filaments (37450-275), with Base assembly for plantar stimulation 37450-278
37450-278	Base assembly for plantar stimulation, including support with columns, perforated metal sheet and multiple configuration animal enclosure, from 3 to 12 spaces.
37450-005	Large Perforated Metal Sheet for Dynamic Plantar Aesthesiometer and Von Frey test
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 37000-006 is not included and should be ordered separately)
37450-045-277	Combination of Large Perforated Metal Sheet 40cm height 37450-045, Von Frey Filaments (37450-275), and animal enclosure 37000-007
37450-085-277	Combination of Large Perforated Metal Sheet 80cm height 37450-085, Von Frey Filaments (37450-275), and animal enclosure 37000-007

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

37450	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.

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.

6.1 Customer Support

For any further information you may desire concerning the use and/or maintenance of the Von-Frey Filaments and accessories, please do not hesitate to contact our service department (service@ugobasle.com) or our local distributor, either directly of via our support page **https://www.ugobasile.com/support/support-request.**

Before sending any instrument to our factory for repair, please contact our logistics department to obtain a return authorization number (**RMA**) and shipping/packing instructions.

We may not be held responsible for damages during transport due to poor packing; whenever possible, please use the original packing.

7 Warranty and quality guarantee

Von Frey kits are designed and manufactured to the quality standards expected for Clinical and Research use.

They meet stated target force and statistical sampling techniques are used to determine mean and standard deviation. Their standard deviation is less than 5% of the target force at room temperature and humidity.

Ugo Basile Srl. warrants its products against defects in materials and workmanship for a period of 12 months.

Ugo Basile Srl. will repair or replace defective items within the specified warranty period. Modifying or tampering with the instrument or non-factory authorized service during the warranty period will invalidate the warranty.

We may not be held responsible for damages during transport due to poor packing.

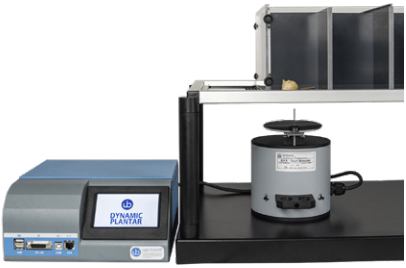
Whenever possible, please use the original packing.

CE

8 References

- Yifan Wang et al., 2021, Tetrahydropalmatine attenuates MSU crystal-induced gouty arthritis by inhibiting ROS-mediated NLRP3 inflammasome activation, *Elsevier*
- Hilary D.Wilson et al., 2006, Hyperbaric oxygen treatment decreases inflammation and mechanical hypersensitivity in an animal model of inflammatory pain, *Elsevier*
- Rajeev Taliyan et al., 2012, Protective Effect and Potential Mechanism of Ginkgo biloba Extract EGb 761 on STZ-induced Neuropathic Pain in Rats, *Wiley Online Library*
- J. Brightwell and B. Taylor, 2007, Noradrenergic neurons of the locus coeruleus contribute to the development and maintenance of neuropathic pain, *The Journal of Pain*
- Sílvia Castany et al. 2016, The antinociceptive effects of a δ-opioid receptor agonist in mice with painful diabetic neuropathy: Involvement of heme oxygenase 1, *Elsevier*
- Angela Jurik et al., 2014, Supraspinal TRPV1 modulates the emotional expression of abdominal pain, *Elsevier*

9 Related products



Dynamic Plantar Aesthesiometer (DPA) for mechanical stimulation

Automates the assessment of "touch sensitivity" on the plantar surface of rats or mice. For assessment of hypersensitivity and allodynia for analgesia, nociceptive, neuropathic and post surgical studies.

e-VF Handheld Electronic Von Frey of original design

Measures mechanical sensitivity thresholds. For the assessment of hypersensitivity and allodynia for analgesic, nociceptive, neuropathic and postsurgical studies. Original design with clear prism for fast localization of stimulation site and reduced animal stress.

PAM Pressure Application Measurement (for joint pain)

The P.A.M. (Pressure Application Measurement) device is the original tool designed for measuring mechanical pain threshold on joint. It was specifically designed and validated for rheumatoid arthritis research and is therefore especially suited to assess joint hypersensitivity in rodent knees or ankles.

Incapacitance Tester Librae

Measures the weight distribution difference between an injured and unaffected hind paw of a mouse or rat. For the assessment of spontaneous pain in osteoarthritis, bone cancer, nerve injury and post-operative pain studies. Automatic operation reduces operator bias, optimizes repeatability and saves time.

10 Other Ugo Basile products

Scan the QR code and

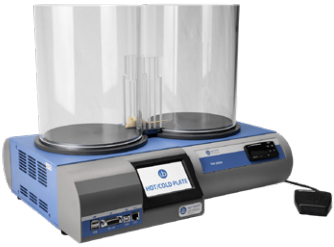
DOWNLOAD THE CATALOGUE

For more details on Ugo Basile products visit ugobasile.com

Analgesy-meter

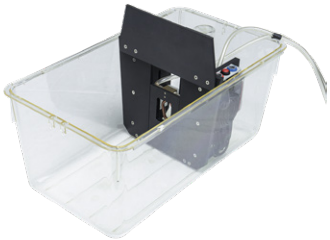
Plantar Test for Thermal Stimulation - Hargreaves Apparatus

Thermal Gradient Ring (TGR)

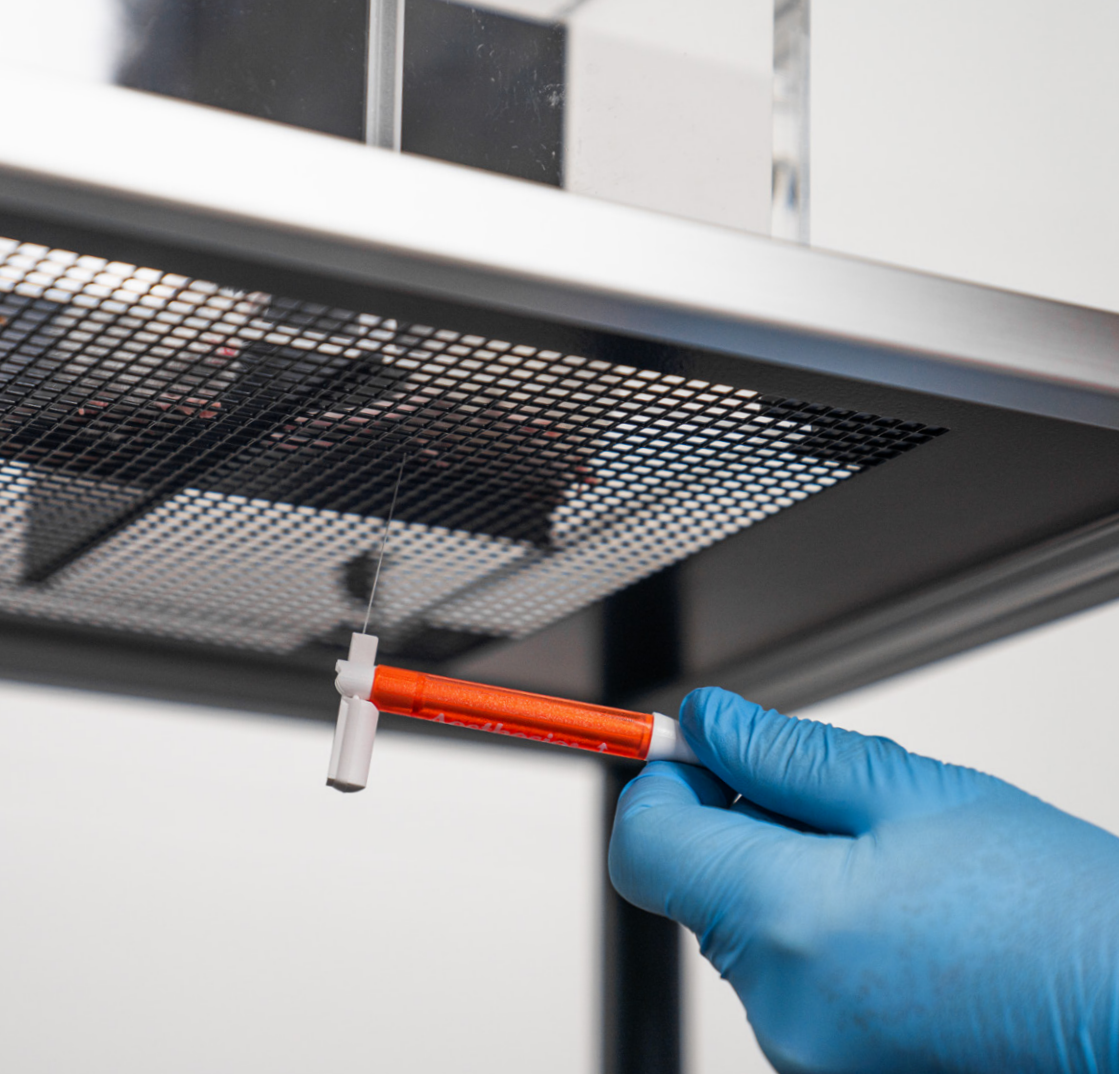


Thermal Place Preference

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



Orofacial Stimulation Test - Fehrenbacher, Henry, Hargreaves method



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Ugo Basile is the world leading company for in-house manufacturing of Behavioral Research devices. We have a large network of experienced partners worldwide.

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