

HIPERMOTION

HIGHLY PERSONALIZED MOTION

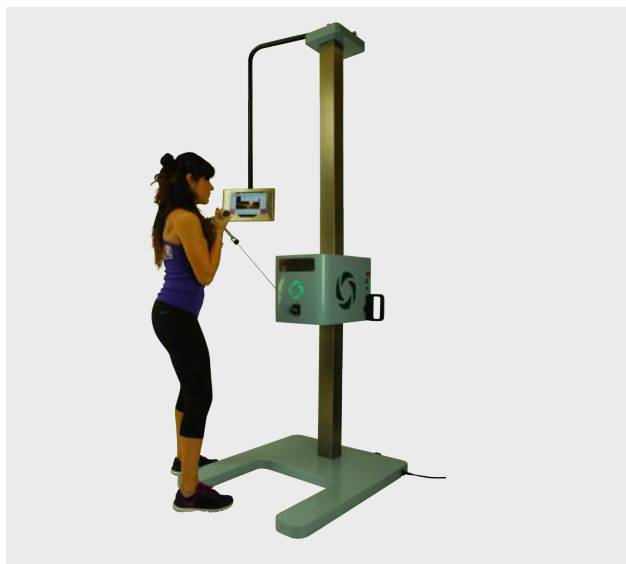


Patented Technology

MaxDFM

*Taking Rehabilitation and
Strength Training to the next level*

What it is...



Dynamic Force Modulation

We have developed a new and innovative medical rehabilitation and training machine. The MaxDFM combines the versatility of a cable pulley with our patented dynamic force modulation technology.

The MaxDFM operates on the principle of:

- dynamic Force Variation over time plus...
- a rapid change in over- and under-load (experienced as vibration) through force modulated technology that triggers the neuromuscular reflex in the targeted muscle(s).

Ideally suited for rehabilitation

Working at the scientifically proven 30Hz, the MaxDFM increases muscle strength by applying a constant modulation of 60% underload with 60% overload of the selected force. The major benefit: over 40-100% increase in training efficiency and less strain and stress on tendons, ligaments and joints. Ideally suited for rehabilitation purposes.



Proven Benefits

- 40% -100% increase in efficiency of muscle activation and fatigue with substantially reduced strain on joints, tendons and ligaments.
- muscle strength increments at half the effort as compared to training without force modulation.
- increased blood muscle perfusion
- higher muscle flexibility
- increased bone density and reduced bone decay
- increased muscle coordination
- the motor-controlled oscillating cable pulley allows for a wide range of exercises for upper and lower body.

Science & Research



The innovative and brand new technology behind the MaxDFM comes from over a decade of scientific

research by dr.ir. Massimo

Mischi and co-workers at the Eindhoven University

of Technology (TU/e). Dr. Ir. Massimo Mischi is Associate Professor at the Signal Processing Systems Group of the TU/e, where he chairs the Biomedical Diagnostics Research Lab. (www.bmdresearch.nl)

Scientific publications

The effects of a 28-Hz vibration on arm muscle activity during isometric exercise. M. Mischi and M. Cardinale, 2009, Medicine & Science in Sports & Exercise.

Novel vibration-exercise instrument with dedicated adaptive filtering for electromyographic investigation of neuromuscular activation. L. Xu et al, 2013, IEEE Transactions on Neural Systems and Rehabilitation Engineering.

On the nature of the electromyographic signals recorded during vibration exercise. L. Xu et al, 2015, European Journal of Applied Physiology.

8-week vibration training of the elbow flexors by force modulation: effects on dynamic and isometric strength. L. Xu et al, 2015, The Journal of Strength and Conditioning Research.

Analysis of vibration exercise at varying frequencies by different fatigue estimators. L. Xu et al, 2016, IEEE Transactions on Neural Systems and Rehabilitation Engineering.

Full control...

Range-of-motion

Also unique and new is that the range-of-motion during every exercise is fully controlled by automatic determination of start- and end-point for each individual user before every exercise. This is, according to our scientific board, an extremely valuable aspect during rehabilitation. Range of motion can be set from 1 cm to 3.7 meters based on subjects own functional range of motion or set by the physiotherapist, trainer or coach.

Force and vibration

Load setting is seamless from 0.2 kgf to 35 kgf with vibration and 50 kgf without.

LED and audio signals then guide the user in correctly performing the exercise under load. Settings, sets and reps are defined for each individual user and recorded for future reference. Pre-determined load profiles can be selected to achieve maximum efficiency in training while protecting the joint structures.

Most important element is that the strength profile can be pre-set as follows:



RAMP UP

Linear increase of resistance over the range of motion



RAMP DOWN

Linear decrease of resistance over the range of motion



FLAT

Constant resistance over the range of motion



PARABOLIC

Up- and down-hill variation of resistance over the range of motion

Web based interface

The user interface to operate the MaxDFM is the Samsung Galaxy tablet provided or any other tablet, smartphone or laptop. The tablet is mounted on a moveable arm for easy access during any exercise. In USER mode, pre-defined exercises and training programs are available for each individual user. In COACH mode, exercises can be defined and training programs developed and monitored for every individual user. Updates in software or new exercises can be remotely installed through the web server installed in the MaxDFM.



GENERAL SPECIFICATIONS

<i>Product name:</i>	HiPerMotion Maximized Dynamic Force Modulation Pulley
<i>Product code:</i>	MaxDFM V1.0
<i>Category:</i>	Free motion fitness vibration equipment
<i>Dimensions/Weight:</i>	L 1005 x W 805 x H 2512 mm / 100 kg
<i>Material:</i>	Steel baseplate and core frame, powder coated central unit, karabiner for user interface, Dyneema cable, tablet mount and remote tablet. With special brackets (optional) the MaxDFM can be wall mounted.
<i>Functionality:</i>	<p>The MaxDFM is a medical rehabilitation device combining the characteristics of a conventional cable pulley with full dynamic force modulation for muscle vibration. The motor-controlled oscillating cable pulley allows for a wide range of exercises for upper and lower body. The MaxDFM cable pulley provides fully controlled strength training and transfers energy to the muscles in the form of vibration. The dynamic modulated load stimulus (experienced as vibration) thus induced on the body causes a stretch reflex resulting in an immediate and intense agonist and antagonist muscle contraction. Muscle vibration induces increase in:</p> <ul style="list-style-type: none">• muscle strength and metabolism.• bone density, counteracting the bone decay process (osteoporosis).• blood muscle perfusion, improving recovery time.• production of hormones such as serotonin and neurotrophine.• muscle flexibility. Vibration training ideally supports stretching exercises.• muscle coordination.

TECHNICAL SPECIFICATIONS

<i>Operating frequency:</i>	0 - 60 Hz (30 Hz default)
<i>Pulling force:</i>	50 kgf peak, 0.2 - 50 kgf without vibration, 0.2 - 35 kgf with vibration
<i>Pulley length:</i>	3.7 m
<i>Safety:</i>	Quick Release Detection
<i>Power supply:</i>	200-240VAC, 50Hz, 6Amax
<i>Nominal Power:</i>	1.0 kW (in operation)
<i>Certification:</i>	CE/MD2006-42-CE / 2001/95/EG / EMC / RoHS
<i>Controls:</i>	Wireless control through embedded tablet or smartphone. The user interface has pre-set training programs supported with instruction graphics and video. Password protected interface allowing therapists, coaches and/or trainers to personalize training programs. All settings, instructions and performance feedback are through the remote unit. Control by smartphone allows for individual training set up and performance feedback tracking. The MaxDFM is network ready. Updates on software, training programs, performance and maintenance can be centrally directed.



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The MaxDFM is powered by:



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