

## EMS-EMA LOW - MIDDLE FREQUENCY IMPORTANCE OF QUALITY AND SAFETY FEATURES

**What is the difference between EMS (electro muscle stimulation) and EMA (electro muscle activation)?**

EMS (Electro Muscle Stimulation) and EMA (Electro Muscle Activation) are both technologies used in fitness and rehabilitation, but they differ in their approach and application:

### **EMS (Electro Muscle Stimulation):**

- **Purpose:** EMS is primarily used for muscle strengthening, muscle recovery, and sometimes for therapeutic purposes such as muscle rehabilitation after injury.
- **Mechanism:** EMS involves the use of electrical impulses to stimulate muscle contractions. These impulses are delivered through electrodes placed on the skin over the muscles targeted for stimulation.
- **Effect:** EMS causes muscles to contract involuntarily, similar to the way they contract during exercise. This can help in muscle conditioning, improving muscle strength, endurance, and in some cases, muscle recovery after strenuous exercise.

### **EMA (Electro Muscle Activation):**

- **Purpose:** EMA focuses on activating muscles to improve neuromuscular function, enhance muscle performance, and optimize muscle activation patterns.
- **Mechanism:** EMA uses electrical impulses to stimulate the nerves that control muscle contraction, rather than directly stimulating the muscle fibers themselves.
- **Effect:** By targeting the nerves, EMA aims to improve coordination and efficiency of muscle activation patterns. This can lead to better muscle control, reduced risk of injury due to improved movement mechanics, and potentially enhanced athletic performance.

### **Key Differences:**

- **Target:** EMS directly stimulates muscle fibers to contract, whereas EMA targets the nerves that innervate the muscles to optimize their activation.
- **Application:** EMS is commonly used for muscle strengthening, rehabilitation, and recovery purposes. EMA is often used for enhancing neuromuscular function, improving muscle coordination, and optimizing movement patterns.
- **Effect on Muscle:** EMS primarily focuses on muscle contraction and strength building, while EMA focuses on improving the nervous system's control over muscle activation.

### **Summary**

While both EMS and EMA involve electrical stimulation for muscle-related purposes, EMS directly stimulates muscle fibers for strengthening and recovery, whereas EMA targets nerves to optimize muscle activation patterns and improve neuromuscular function. The choice between EMS and EMA depends on the specific goals of the user, whether it be muscle strength, rehabilitation, or movement optimization.

## Why are middle and low frequency combinations better than only low frequency?

The combination of middle and low frequency electrical stimulation is considered advantageous when compared to using only low frequency stimulation due to several reasons related to physiological effects and practical applications:

### 1. Depth of Penetration and Muscle Activation:

- **Middle Frequency:** Middle frequency currents (typically in the kHz range) penetrate deeper into the tissues compared to low frequency currents. This deeper penetration allows for more extensive stimulation of muscle fibers and motor nerves that are located deeper within the muscle tissue.
- **Low Frequency:** Low frequency currents (typically in the Hz range) have limited penetration depth and primarily affect superficial muscle fibers and nerves.

### 2. Coverage of Different Muscle Fiber Types:

- **Muscle Fiber Types:** Muscles are composed of different types of muscle fibers (slow-twitch and fast-twitch). Middle frequency currents can effectively stimulate both types of muscle fibers due to their deeper penetration and ability to recruit a wider range of motor units.
- **Benefit of Combination:** By combining middle and low frequency currents, you can effectively target both superficial and deep muscle fibers. Low frequency stimulation alone may not reach deeper muscle fibers adequately, potentially leaving certain muscle groups under-stimulated.

### 3. Enhanced Muscle Activation and Coordination:

- **Synergistic Effect:** The combination of middle and low frequency currents can lead to a synergistic effect on muscle activation. Middle frequencies can initiate contractions in deeper muscle layers, while low frequencies can help synchronize these contractions across different muscle groups.
- **Improved Coordination:** This synchronization and enhanced activation can improve overall muscle coordination and functional movements, which is beneficial for rehabilitation, athletic performance, and functional training.

### 4. Pain Management and Comfort:

- **Reduced Discomfort:** Middle frequency currents often induce less discomfort or pain compared to low frequency currents, especially when higher intensities are used. This can make the therapy more tolerable for patients undergoing rehabilitation or training.
- **Flexibility in Treatment:** The ability to adjust the combination of frequencies allows for a more tailored treatment approach based on individual needs and sensitivities.

The combination of middle and low frequency electrical stimulation offers a more comprehensive approach to muscle activation and therapy by targeting a broader range of muscle fibers, improving muscle coordination, and potentially reducing discomfort associated with higher intensity low frequency stimulation. This makes it a preferred choice in many rehabilitation and athletic training settings where optimizing muscle function and recovery is crucial.

**Beside the above mentioned extra benefits of EMA and Middle frequency what are the key factors of a high quality EMS training?**

- 1. A good quality suit, fits like a glove**
- 2. No wetting needed**
- 3. High quality electrodes**
- 4. Right frequency cocktails, preset programs**
- 5. Training videos (YES, or NO?)**

- 1. Perfect cut and fit** are crucial to get the right contact between skin and electrodes. Underwear (even a sport bra or a thin pants) blocks the stimulation. The Nuzuna system not only contacts the skin and provides impulses, but it also collects body feedback, like hydration, resistance, kcal, ECG, and BPM, helping to achieve optimal results.
- 2. No wetting needed.** Nuzuna suits don't require wetting and can be used outdoors even in cold regions, as conventional sport outfits (hoodie, pants, shorts) can be worn above the suit.
- 3. High quality electrodes** are the most important key to have a successful training or treatment. As electricity is delivered by liquids in the body (blood, water, sweat), hydration is crucial before training and is how body parts are stimulated. Another important factor to provide a better connection is circulation. A proper warm up will enhance circulation. Older people or those with low circulation may need a longer warm up time.  
  
If the quality of the silver electrodes is not good enough, injury can happen due to skin burns or extreme muscle contraction that may cause muscle fibre damage. Nuzuna produces and tests suits in its own factory, using the highest quality flexible wires, silver and silicon electrodes and thanks to 12 channels and 24 electrodes provides full body and muscle coverage.
- 4. Right frequency cocktails, preset programs.** Nuzuna not only stimulates the surface but also activates deep muscles and cells. Thanks to the low and middle frequency cocktails each pre-set program can simulate different type of activities in the body, like strength, fat burning, endurance type of muscle activity, deep tissue massage, muscle relaxation, or anti cellulite effects.  
  
Low frequency alone serves rehabilitation purposes, but not sufficient for high level sport performance, as muscles always get the same stimulation/frequency, and they get accustomed to it after 2-3 months. It's like always doing the same exercises with the same weight in the gym. After a while no further progress is accomplished. Due to the frequency cocktails and the limitless stimulation and relaxation phase settings this can't happen with a Nuzuna suit.
- 5. Training videos.** The Nuzuna system was created 10 years ago in Germany, where EMS has been popular for 20 years. The goal was to create an easy-to-use product and boost any kind of workout, like jogging, power walking, classical gym training, Clients were not interested to watch videos and do static trainings in front of a TV, so membership was not augmented with videos. As the USA EMS market is still in a formative phase, Nuzuna is working on educational and training videos for those who would benefit from video assistance. Meanwhile the Nuzuna system also provides freedom to those who want to train free and outdoors. Nuzuna we will offer both options: package with or without membership.