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# MATE-XB

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Muscular Aiding Tech  
Exoskeleton



# WHAT IS MATE-XB?

**MATE-XB** is a **non-powered** exoskeleton for relieving the muscular effort at the **lumbar district** for workers who need to move weights. It supports the user while working in **different positions**, e.g., when bending with the legs (squatting), bending forwards, or repetitive lifting of loads. The device is **designed to reduce back strain** during these activities and **improve the quality** of the user's work experience.

## TORQUE GENERATING BOX (TGB)

Core mechanism that stores and transforms potential mechanical energy in order to create an adjustable assistive torque.

- Assistance is proportional to the torque generated by the upper part of the body
- Gentle assistance up to 25 kg
- Possibility of tuning the amount of support over 5 levels
- No hindrance while walking



## GARMENT INTERFACE

All parts in direct contact with the user's body.

- Breathable and bio-compatible materials
- Wide contact area to distribute reaction forces without causing high-force points

## MECHANICAL KINEMATIC CHAIN

Structure that facilitates the free movement of the user.

- The device allows the user to move the trunk freely
- The passive kinematic chain is designed to be compact around the human body
- The passive kinematic chain is designed to deal with the human-exoskeleton kinematic compatibility

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## HOW DOES IT WORK?

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**MATE-XB GIVES YOU THE EXACT LEVEL OF SUPPORT WHEN AND WHERE YOU NEED IT**



The assistance provided by the MATE-XB exoskeleton mimics the effect of the trunk flexion on the lower back.

**MATE-XB MOVES IN ARMONY WITH YOUR BODY**



Thanks to a chain of passive degrees of freedom, the exoskeleton allows the whole user's freedom of movement.

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## JUST THE WAY YOU DO

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# MATE-XB FIT YOUR BODY

## GIVING YOU THE FREEDOM TO MOVE

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**MATE-XB WORKS WHEN, WHERE AND HOW YOU DO.**

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# EXTREMELY ERGONOMIC, EVERYWHERE

**FULL MOBILITY  
OF THE ENTIRE BODY**

**EASY ENABLE/  
DISABLE SWITCH**

**EASY SELECTABLE  
ASSISTANCE**

**FAST DONNING  
AND DOFFING**

**LIGHTWEIGHT AND  
ROBUST STRUCTURE**

**HIGH  
PERSONALIZATION/FITTING**

**COMPACT DESIGN**

**INTUITIVE AND  
EASY-TO-USE ADJUSTMENTS**

## EXTERNAL RESISTANCE



# WHY IS MATE-XB UNIQUE?

## FOR WORKERS

**REDUCED  
MUSCULAR  
EFFORT**

**35%** ↓  
ON THE  
BACK

Using MATE generates a steady reduction in back muscle activation during activities, reducing muscular strain

**PERCEIVED  
EFFORT  
REDUCTION**

**50%** ↓  
ON THE  
LOW BACK  
ZONE  
PERFORMING ACTIVITIES

Workers' perception highlighted high correlation between perceived strain reduction and the measured reduced muscular effort

## FOR COMPANIES

**POSITIVELY  
IMPACT YOUR  
ERGONOMICS**

**LOW-COST  
FLEXIBLE  
ERGONOMIC  
SOLUTION**

**DEPLOYABLE IN  
AREAS WHERE  
AUTOMATION IS  
NOT POSSIBLE**

**ADDRESS  
WORK-RELATED  
MUSCULOSKELETAL  
DISORDERS**



MATEXB



MATE

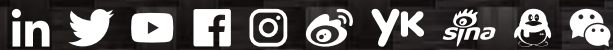


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