

# Ambroise

## MANUAL WILMER® ELBOW ORTHOSIS

Product in the WILMER® line  
Part of the IMS series



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**USER**



**PRODUCT INFORMATION**



**PROFESSIONAL**

# WILMER® ELBOW ORTHOSIS INFORMATION FOR THE USER

The WEO (Wilmer Elbow Orthosis) has been developed for people with paralyzed muscles around the elbow. The orthosis offers a number of functions that have been lost around the paralyzed elbow. In this manual, you can read more about the causes of reduced strength around the elbow and the operating principle of the elbow orthosis.

## WHEN A WEO?

The WEO is developed for people suffering from (partially) paralyzed muscles around the elbow, for example because the nerves that stimulate the muscles around the elbow are damaged. Because the muscles in the arm are no longer active, the arm can not be lifted properly.

## CAUSES OF PARALYSED ELBOW

The cause of a paralyzed elbow, in most cases, is a damage to the ganglion of the arm (Brachial plexus). This can be caused by a fracture or obstruction, for example after a motorcycle or bike accident. Also, the brain may not function properly, for example due to stroke. Sometimes the nerve damage occurred during birth. This is called Erb's palsy.

## THE WEO

The WEO has a spring mechanism that helps to move your arm. In addition, in the hinge there is a locking mechanism that can hold your arm stable in 90° so that the arm can carry something, for example a cup or a bag (up to 3 kg). The elbow can also be locked in 35°. In this position you can move your arm from your shoulder without uncontrollable movement of the forearm. This is the position that reduces arm sway while walking, so that the arm does not bump against objects. In the 35° locking position, the elbow orthosis can be loaded from below up to 3 kg. For example, a newspaper or book can be pressed against the table with the paralyzed arm, from the shoulder.

The locking mechanism can be switched off as desired. In this situation, the spring of the hinge supports the remaining muscular functions. Switching the locking mechanism off is for example necessary while driving a car so that locking at undesired moments is not possible.



Figure 1: The WEO

## Advantages of the WEO

- ✔ Restoration of elbow function
- ✔ Reduced arm sway
- ✔ Locking mechanism can be operated by the paralysed arm itself
- ✔ Arm on the unaffected side retains full freedom
- ✔ Locking mechanism can be turned off
- ✔ High wearing comfort
- ✔ Can be worn fully underneath clothing
- ✔ Easy donning and doffing
- ✔ Custom made and therefore perfect fit
- ✔ Low weight

The elbow orthosis is invisible when worn beneath the clothing on the medial side of the arm. The pelottes between the orthosis and arm ensure optimum force transfer and excellent wearing comfort. The pelottes are perforated and therefore minimize perspiration and skin problems. The orthosis is individually made.

## TREATMENT IS NECESSARY

The underlying causes of paralysis of the arm are usually permanent. This means that without treatment the arm loses its functionality. Often swelling or oedema formation occurs in the hand, fingers and forearm. The WEO can give functionality back to the paralyzed arm.

## DONNING THE WEO

The WEO is easy to put on. Put your arm through the orthosis, until the hinge is at the location of the elbow and the hand is resting on the hand support, if you have chosen for a hand support.

## LOCKING AT 35° POSITION

Let the orthosis slowly stretch just beyond 35°. A click makes it clear that the 35° limit has been exceeded. When the orthosis is now released, it will spring back into the 35° locking position. In this position the orthosis can be loaded from below up to 3 kg.

## UNLOCK FROM THE 35° POSITION

Let the orthosis slowly stretch a bit further (8°). A click makes the transition clear again. The orthosis now no longer locks in the 35° position.

## LOCKING IN THE 90° POSITION

Raise the arm using a trunk or shoulder movement. The spring helps with the movement so it will already work with a small shoulder pulse. If the arm has been moved just beyond 90° it will slowly lower again, but will fall into the lock exactly at 90°.

Now the orthosis can't be stretched further than the 90° position. In this position the orthosis can be loaded from above up to 3 kg. When the user's arm is placed in the orthosis, the weight of the user's forearm is sufficient to ensure that the orthosis actually locks in the 90° position. If the user's arm is not placed in the orthosis, the orthosis will bend completely to 140° after release.

## UNLOCK FROM THE 90° POSITION

From a shoulder movement, bend the elbow slightly further. A click indicates that the lock has been released. The elbow joint can be fully extended again.



Figure 2: Locking and unlocking the WEO

## SWITCHING OFF THE LOCK

The locking mechanism of the elbow joint can be switched off by placing the pull knob on the end of the forearm tube in the deep part. The orthosis can now bend and stretch without locking, over the entire 140° range. When the pull knob is placed in the undeeep hole, the locking mechanism is switched on again.

## SETTING THE SPRING TENSION IS IMPORTANT

It is important that the tension of the spring of the elbow joint helps to compensate the weight of the forearm of the user. When the tension of the spring is too strong, the forearm is always pulled upwards and the orthosis will not lock in the 90° position. When the tension of the spring is too low, it takes too much effort to get the forearm past the 98° position before being able to stretch the arm again.

## ONE ARM OPERATION

Locking and unlocking of the elbow joint can in most cases be done with or by the paralyzed arm. Important is the remaining residual function of muscles in the arm and/or the shoulder. In most cases, one of the following operating principles or a combination of a number of them is sufficient to be able to operate the elbow joint of the elbow orthosis.

## USE OF REMAINING ARM BEND MUSCLES

The spring of the elbow joint compensates most of the gravity acting on the forearm. Residual arm bend function may be sufficient to bend the forearm into the 90° position (for locking) or beyond the 98° position (for unlocking).

## ABDUCTION OF THE UPPER ARM

With normal individuals, the forearm begins to bend automatically (without using the muscles) when the upper arm is brought to abduction beyond 90°. When the elbow orthosis is added to the arm, an abduction angle of 30° (depending on the set spring force) is sufficient to allow the forearm to bend.

## BACKWARD AND FORWARD MOVING OF THE UPPER ARM

Move the upper arm backwards and forwards, for example by moving the trunk quickly forwards and backwards. When the forward movement of the upper arm is interrupted, the forearm will swing through because inertia and reach the 90° position after some practice.

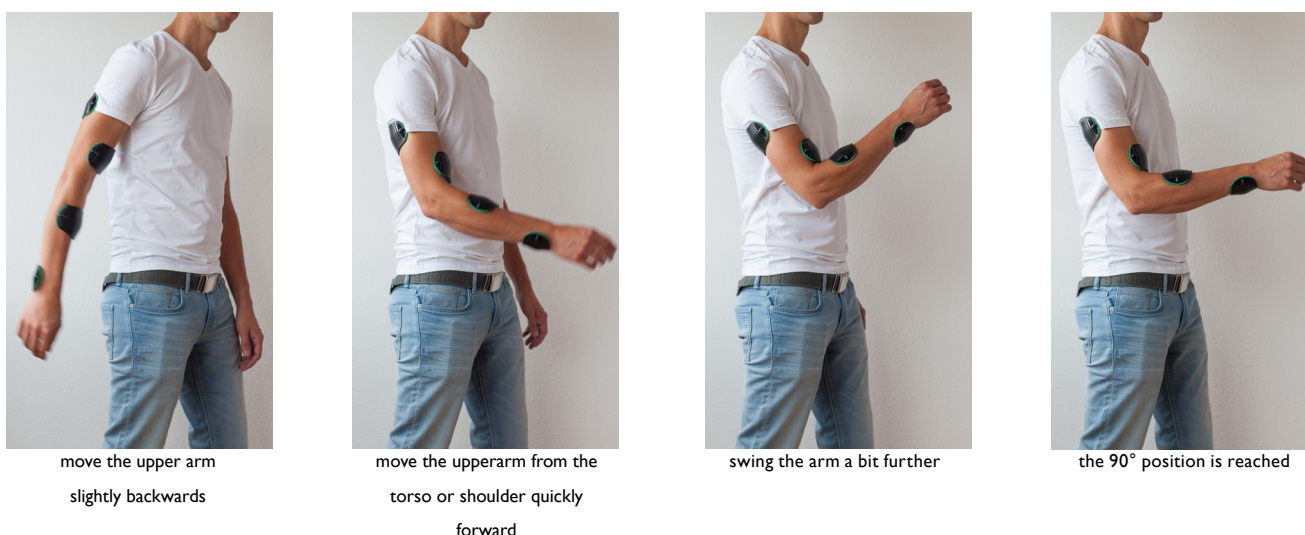


Figure 3: Backwards and forward moving of the upper arm

## USE A PLEXION PULSE

Move the shoulder forward and quickly backwards. Here too, the inertia of the forearm will ensure that it reaches the 90° position after some practice. This method of operation is very similar to the previous one. The difference is in the muscle groups that are being used. In this method, the shoulder muscles are mainly used. While in the previous example, the trunk especially does the job.

## PERIOD OF TRAINING

Most users of an elbow orthosis learn to use the orthosis very quickly: in the order of minutes to several hours. Additional training and instruction by for example an occupational therapist and/or physiotherapist is nevertheless recommended.

## THE WEO FOR YOU?

Our clinical experts will be happy to evaluate with you what the best solution is in your case.

Contact us now to learn about the options to get a WEO in your region.

Your local orthotist and physiatrist can also indicate whether the WEO is a viable option in the treatment of your situation.

If you want more information about the wrist orthosis, or if you are wondering if the WEO could benefit you, call us today on +31 (0)53 430 28 36 or email us [info@ambroise.nl](mailto:info@ambroise.nl).

# WILMER® ELBOW ORTHOSIS PRODUCT INFORMATION

## WEO MODELS

The elbow orthosis is available in two models.

The **standard model** (figure 4) only supports the affected elbow, but leaves the hand and fingers free.

The **hand model** not only supports the forearm but also the hand and wrist by means of a hand support (figure 2) in cases of poor wrist and hand control. The WEO needs to be fitted to the arm of the client. All models are available in one size, **left** and **right**. The elbow orthosis is usually worn on the medial side, but can also be worn laterally. Order in this case a left orthosis for a right arm and vice versa.

The Wilmer Elbow Orthosis is suitable for forearm lengths of 16 cm up to 25 cm (measured from styloid to olecranon) and circumference of 23 cm up to 34 cm (largest part of forearm). Alternative available upon request, see page 9.

## ITEM NUMBERS

Standard model left:	250019
Standard model right:	250020
Hand model left:	250015
Hand model right:	250016
Bending pliers 4/5mm (see figure 6):	300180
Bending blocks (see figure 7):	300129

## MAINTENANCE WEO

The WEO can be cleaned with a damp cloth.

## REPLACEMENT OF SPARE PARTS

It may occur that parts of the orthosis need to be replaced. Of course you can order these from us. Please contact us and we will send a replacement part.

## ADJUSTING THE ORTHOSIS

If you have the feeling the orthosis is too tight (pinches) or too loose (slips) it is important that the orthosis is properly adjusted. Contact your local orthotist.

## SPECIFICATIONS

Weight orthosis: 100 gram.

Range of motion: 0° - 140°.

Minimal moment: 1 Nm.

Maximum moment: 4 Nm.

Maximum loading on hand/wrist: 3 kg.

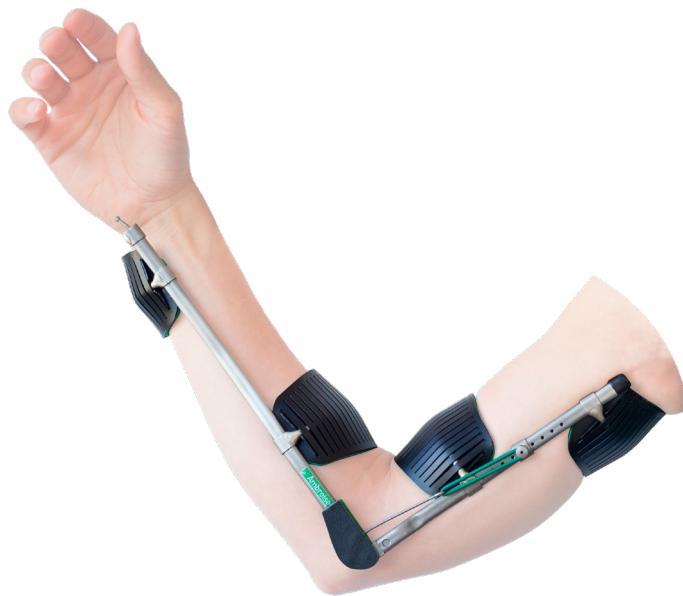


Figure 4:WEO, right arm, standard model



Figure 5:WEO, right arm, medial side with handsupport

## WILMER ELBOW ORTHOSIS INFORMATION FOR THE PROFESSIONAL

### PRODUCT PACKAGE

- one elbow orthosis (one size; individually adjusted to shape of arm)
- one hand support (for hand model only)
- transparent bending tool
- four rubber caps for pelotte carrier (preassembled)
- one stainless steel pulling knob
- one insert pin for the purpose of mounting the pulling knob
- one spring suspension pin which can be used for mounting the pulling knob as well.
- one set polyform hinge upholstery
- an additional spring for the elbow joint
- one rubber protection cap for forearm tube
- one glue tube (contains Loctite® 638)

### FITTING MANUAL

#### Preparation

1. Mark on the arm, the location of the medial condyle. This is the reference for the elbow axis. Position the axis of the elbow orthosis on the medial condyle marking.

#### Upper arm

2. Shorten the upper arm tube if the upper arm tube causes problems in the armpit. The tube can be finished with the supplied rubber cap.
3. Position the pelotte carriers of the upper arm at the desired positions. The pelotte carrier that is closest to the joint is placed on the anterior side. Make sure the skin of the elbow fold remains free. The proximal pelotte carrier is located on the posterior side as high as possible. Glue the slider to the desired position with the supplied glue (Loctite 638).
4. If necessary, adjust the shape of the pelotte carriers of the upper arm to the shape and width of the arm. Use the Ambroise pliers of 4/5 mm, (figure 6). Remove, if necessary

first the pelottes. (see page 9 and [www.youtube.com/AmbroiseHolland](http://www.youtube.com/AmbroiseHolland)) Using these tools prevents damage to the product and works effectively. Make sure the flat upper arm tube is on the axis of the upper arm This will *not* be bent.



Figure 6: Pliers

#### Forearm

5. Adjust the shape of the forearm tube to the shape of the forearm. Place the transparent bending tool in the forearm tube before bending. Be aware of the cable that runs through the forearm tube to the elbow joint. Use the Ambroise bending blocks (figure 7, and see previous page for item code). Cut the forearm tube at the right length just behind the ulnar styloid process. Watch the cable in the forearm tube!
6. Position the pelotte carriers of the forearm at the desired locations. Glue the slider to the desired position with the supplied glue (Loctite 638). The pelotte carrier closest to the joint, is placed on the anterior side. Prevent pinching of the skin of the elbow fold with the pelotte carriers. The distally placed pelotte carrier lies on the

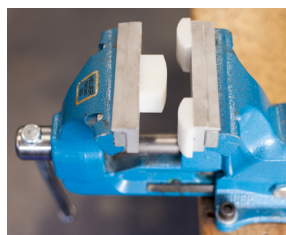


Figure 7: Bending blocks

posterior side, as close as possible to the wrist.

7. Adjust the shape of the pelotte carriers of the forearm to the shape and width of the arm. Make sure to use the Ambroise pliers, (figure 6). Make sure the flat forearm tube is on the forearm axis.
8. Put the rubber cap on the end of the forearm tube.
9. If necessary, different sizes of pelotte carriers and pelottes can be ordered (see order form appendix).

#### Hand support

10. If a hand model has been chosen, the arm orthosis is supplied with a hand extension. Determine the length, shape and position of the hand extension and shorten it at the required length. The alignment of the hand in the hand support must be determined relative to the forearm before securing. Connect the hand support to the hand extension by using the dot-press-lock system in for example a vice. If necessary, make the hand carrier smaller or wider. (see [www.YouTube.com/AmbroiseHolland](http://www.YouTube.com/AmbroiseHolland) for an instruction video).

#### Pulling knob

11. Carefully attach the insert of the pulling knob with the help of glue from the glue pipette into the forearm tube at the wrist. Place the supplied support pin in the free hole in the elbow joint. Push the wire, with some glue for extra securing, through the pull knob and place it in the shallow part of the insert part. Pull, with the wire, the release pawl firmly against the support pin in the hinge. Tighten the screws on the knob. Remove the support pin from the joint. Check the operation of the locking mechanism. Cut off the wire just behind the knob.

## **Spring tension**

12. Adjust the spring of the elbow joint in such a manner that it almost compensates the weight of the forearm. (figure 8) If necessary, attach the extra spring (see [www.youtube.com/AmbroiseHolland](http://www.youtube.com/AmbroiseHolland) for an instruction video).

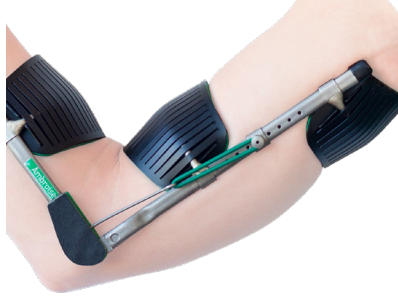


Figure 8: Spring



## DOT-PRESS-LOCK HANDEXTENSION



Follow these steps when mounting the hand support to the W2DO/ WEO/WSO.

A dot is welded to the hand support



Step 1: Position the hand in the desired angle. (pronation - supination). And mark the right angle with a marker.



Step 2: Mark also the opposite side.



Step 3: Remove the hand support from the hand extension frame, and apply the glue (Loctite® 638).



Step 4: Put the hand support back on the tube. Make sure the marked lines match.



Step 5: Press the dot inwards with a vice in order to lock the hand support in place.



Step 6: The dot is now pressed into the tubes so the hand support is secured in place.

# WEO ORDER FORM SPECIAL SIZES PELOTTE CARRIERS

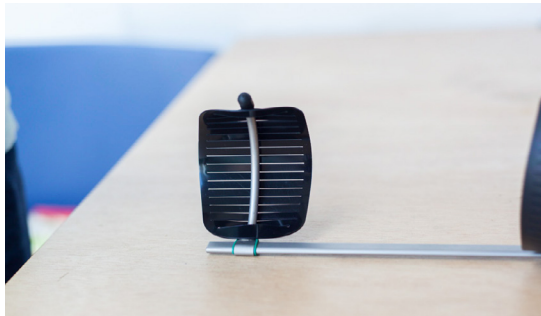
Mail this form to [info@ambroise.nl](mailto:info@ambroise.nl) to order differently sized pelotte carriers for your client.



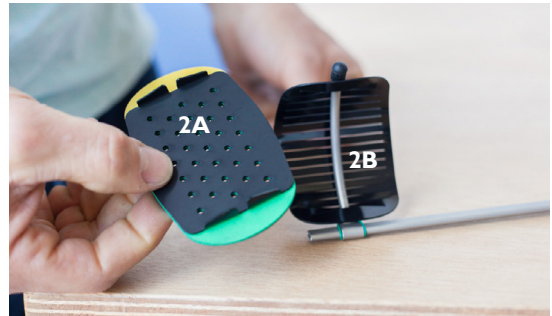
Size	Pelotte size		Suitable circumference	Lower limit	Upper limit	Item code	Amount
IMS-XS	60 mm	wrist	160 mm	140 mm	180 mm	250350	<input type="text"/>
IMS-S	80 mm	forearm/upper arm	200 mm	180 mm	220 mm	250351	<input type="text"/>
IMS-M	100 mm	forearm/upper arm	240 mm	220 mm	260 mm	250352	<input type="text"/>
IMS-L	120 mm	forearm/upper arm	280 mm	260 mm	300 mm	250353	<input type="text"/>
IMS-XL	140 mm	forearm/upper arm	320 mm	300 mm	350 mm	250354	<input type="text"/>

The standard WEO is assembled with pelotte carriers in size XS for the wrist and size M for the other pelotte carriers.  
If necessary, P1, P2, P3 and P4 can be delivered in size S, M, L and XL.  
Please send us what size you request by filling in this form.

Placing pelottes. Identical for all IMS pelottes. In this series you see the application to the Wilmer Elbow Orthosis.



1. Slide the outer shell on the tube (matte side out).



2A: inner shell + 2B: outer shell.



3. Remove the yellow strip, and press the flaps of the inner shell through the first groove of the outer shell.



4. Shape to an S-bend.



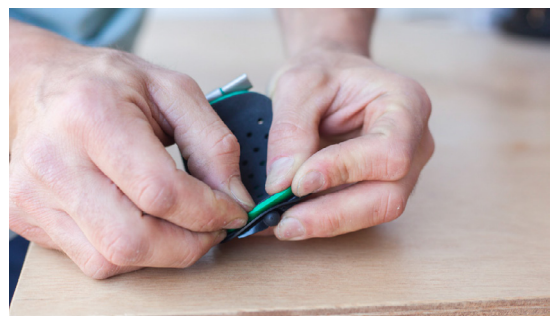
3. Press the flaps of the inner shell through the outer groove of the outer shell.



4. Push the flaps properly through the groove in order to make them snap in place so they are visible on the outside.



5. Remove the yellow strip so that the adhesive strip is exposed.



6. Press the adhesive strip well.



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