

## Table: comparison recommendation ergonomic material

### Adjustable hairdressing chairs

Source	Adjustable hairdressing chairs
<p>Miet Verhamme, (2015) <i>'Op-één-haar-na'</i>, <i>Ergonomie voor de startende kapper</i>, transnationaal ESF project, UBK/UCB vzw-asbl</p>	<p>A good adjustable chair in which the customer sits:</p> <ul style="list-style-type: none"> <li>• is easily adjustable, so you can work on the right height and close to the customer,</li> <li>• doesn't have a too high backrest,</li> <li>• isn't too wide, making the distance between yourself and the head of the customer not too large and it doesn't require you to overreach,</li> <li>• has a stable and flat foot, so you can place your feet on it,</li> <li>• can at least turn 45 degrees to the left or right, but preferably not all the way around. For children there is a separate chair or at least a booster seat.</li> <li>• If possible, use technical assistance (pump) to limit effort and repetitive motions as much as possible.</li> <li>• Make sure that the pumping mechanism is at the right side, making it easily reachable for your feet.</li> <li>• Frequently adjust the right height during your work. If you are working on top of the head of the customer, then it requires a different height compared to working on the neck of the customer.</li> </ul>
<p>M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers, Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i>, TNO Arbeid</p>	<p>With a good adjustable chair the following risk factors are avoided: back inclination, neck inclination and arm elevation. This is because it is possible to stand close to the customer and work at the right hairdressing height.</p> <ul style="list-style-type: none"> <li>• Highest stand min. 550 mm (Osinga, 1993). Lowest stand max. 400 mm (Osinga, 1993). Height variation min. 38 cm (Petersson, 1994).</li> <li>• Height adjustment foot pedal (Osinga, 1993).</li> <li>• Operating force 20 to 50 Newton (Osinga, 1993).</li> <li>• Striking length less than 250 mm (Osinga, 1993).</li> <li>• Rotatable chair is preferred (Osinga, 1993).</li> <li>• Outer diameter max. 70 cm (Osinga, 1993).</li> <li>• Backrest width max. 5 cm (Osinga, 1993).</li> <li>• Arm rest width min. 460 mm (Osinga, 1993).</li> <li>• Seating depth min. 380 mm (Osinga, 1993).</li> <li>• Backrest height max. 450 mm (Osinga, 1993).</li> <li>• Arm rests to front of chair min. 100 mm (Osinga, 1993).</li> <li>• Foot base min. 5 feet (Osinga, 1993). • Tipping point min. 195 mm (Osinga, 1993).</li> <li>• Length foot of the chair max. 365 mm (Osinga, 1993). • Boundary circles for the chair max. 25 cm (Petersson, 1994). • floor circle diameter max. 35 cm (Petersson, 1994). • Prerequisites for inclination backrest: see Petersson, 1994): - operating force max. 10 N for the changing of the inclination of the backrest; - min. Height for operation 80 cm above floor level; - min. 40° inclination backrest • Operating must be simple • There must be enough empty space around the adjustable seats (min. 75 cm between seats).</li> </ul>



<p>J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen voor de kapper</i>, Beroepsgebonden Musculoskeletale Aandoeningen, FOD Werkgelegenheid, Arbeid en Sociaal Overleg</p>	<p>Chairs adjustable in height</p> <p>a. For the customer: use for the client a chair which is adjustable in height. That limits the bending of the torso and the neck, as well as the raising of the arms (above shoulder level).</p> <ul style="list-style-type: none"> <li>• Adjustable in height between minimum 45 cm for the lowest position and minimum 59 cm for the highest position.</li> <li>• The backrest cannot be too high (max. 50 cm)</li> <li>• A special seat for children</li> </ul>
<p>Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing</i>, presentation, Olymp</p>	<p><b>Ergonomic Parameters</b></p> <p>Ergonomic shape</p> <ul style="list-style-type: none"> <li>• Lower seat height</li> <li>• Head holder</li> <li>• Pump mechanism and pump height</li> </ul> <p>Comfort mechanism for back adjustment</p> <ul style="list-style-type: none"> <li>• Stability</li> <li>• Rolls</li> </ul> <p><b>Recommendations</b></p> <ul style="list-style-type: none"> <li>• Based on the standard for office chairs SN EN 1335 for stability, strength, durability and safety requirements</li> <li>• Lower Seat height chair (without footrest) max. 490mm</li> <li>• Pump height chair min. 170mm</li> </ul> <p>Rolls with possibility of cleaning</p>
<p>R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus</i>, ANKO, FNV MOOI and CNV Vakmensen</p>	<p>The sitting height is easily adjustable without levels. The setting range of the chair is at least 45 to 59 cm above the floor. The form of the chair base is free, as long as the chair is stable in every form and the hairdresser is not hindered during the walking or moving on the hairdressing saddle stool. Around the adjustable chair. To be stable, a chair base is recommended with 5 feet, minimum length of 24 cm. For a round chair base the diameter is at least 19,5 cm and for a square chair base the measurement is at the minimum 39x39 cm. To be able to move the saddle stool well around the chair, the maximum measurement of a foot of the adjustable chair is 37 cm and for a square chair base 60 x 60 cm. The chair can turn at the minimum 45 degrees on the base. The height of the backrest is maximum 50cm, measured from the seating. The backrest does not have a headrest, except for the technical action of shaving and trimming.</p> <p>Alternative: the mobile hairdresser is being advised to ask the customer to assume a good working height, for example by sitting on an adjustable office chair, by using pillow to sit higher, or to ask the customer to sit lower or to stand up. If necessary, the hairdresser should sit down as well. For the technical working with children: if they are smaller than 115 cm, they should sit on a highchair. If they are between 115 and 160 cm, they</p>

	<p>should sit on a booster which is placed on an adjustable chair. If a booster is being used, it should increase the sitting height of the adjustable chair with at least 20 cm. A highchair is adjustable in height and it has sitting height of at least 79 cm from the floor.☒</p> <p>Alternative: the mobile hairdresser is advised to ask the child as far as possible to assume a good working height, for example by using a chair with a booster or pillows to increase the sitting height, by sitting lower or by asking the child to stand up. If necessary, the hairdresser should sit down as well.</p>
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## Backwash units

Source	Backwash units
<p>Miet Verhamme, (2015) <i>'Op-één-haar-na'</i>, <i>Ergonomie voor de startende kapper</i>, transnationaal ESF project, UBK/UCB vzw-asbl</p>	<p>A good backwash unit</p> <ul style="list-style-type: none"> <li>• is adjustable in height and can be tailored to body type of every hairdresser,</li> <li>• can be put in a slanted position,</li> <li>• has a limited length,</li> <li>• is free standing, in order for the hairdresser to move around freely (at least partially),</li> <li>• has sufficient space beneath the backwash unit, leaving space for the feet and knees.</li> </ul> <p>Points of attention:</p> <ul style="list-style-type: none"> <li>• The optimal working height for working at the backwash unit is around elbow height because during the washing some execution of force is needed. That is why the working height at the backwash unit is lower than the hairdressing chair.</li> <li>• An ergonomically reasonable adjustable chair and backwash unit combination is also important.</li> </ul>
<p>M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers</i>, <i>Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i>, TNO Arbeid</p>	<p>Good backwash units can prevent the following risks: back inclination and arm elevation.</p> <ul style="list-style-type: none"> <li>• Backwash unit on swivel arm height: standing at maximum 1020 mm (Osinga, 1993). Height sitting: max. 900 mm (Osinga, 1993).</li> <li>• Backwash unit/chair combination height: standing max. 980 mm (Osinga, 1993).</li> <li>• Height sitting max. 880 mm (Osinga, 1993).</li> <li>• Adjustable range at least 960 mm (Woldring, 1999); max. 1160 mm (Woldring, 1999).</li> <li>• Height of the unit is dependent of elbow height; average for woman from the floor to the top of the upper rim of the backwash unit: 1050mm (P5 = 980 mm, P95 = 1215 mm + 75 mm (Woldring, 1999).</li> <li>• Backwash unit measurement: length max. 300 mm (distance backside to edge of the neck support), (Osinga, 1993: 350mm, Petersson and Woldring 300 mm); - width max. 500 mm (Petersson, 1984: left ear to right edge = 300 mm of which head width: P5 woman= 140 mm, P95 man = 160 mm, average 155 mm).</li> <li>• Woldring 1999: max. 600 mm</li> <li>• Depth max. 150mm (Osinga, 1993, Woldring, 1999).</li> <li>• Base has no extending or sharp parts (Osinga, 1993).</li> <li>• Free space beneath the backwash unit to take into account the use of the saddle stool (Osinga, 1993, Woldring, 1999).</li> <li>• Depth leg space floor min. 420 mm.</li> <li>• Depth leg space height min. 240 mm.</li> <li>• Height leg space min. 600 mm.</li> <li>• Placement of water taps preferably at the side or bottom (Petersson, 1984).</li> <li>• The adjustment of the seat of the backwash unit for the combination should be so that by moving the seat the backrest inclines at the same time (Osinga, 1993).</li> <li>• Space around backwash units: maximum 2 backwash units next to each other and the space at the back and should be at least 500 mm (excluding</li> </ul>

	<p>walking space) (Osinga, 1993).</p> <ul style="list-style-type: none"> <li>• mobile backwash units should be able to incline the backrest (Folder: 'gezond werk begint bij de verbouwing', 1992).</li> </ul>
<p>J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen voor de kapper</i>, Beroepsgebonden Musculoskeletale Aandoeningen, FOD Werkgelegenheid, Arbeid en Sociaal Overleg</p>	<ul style="list-style-type: none"> <li>• Horizontal distance between the neck support and the backside of the backwash unit should be between min. 38 cm and max. 43 cm;</li> <li>• Maximum depth between the neck support and the bottom of the sink: max. 15 cm.</li> </ul>
<p>Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing</i>, presentation, Olymp</p>	<p><b>Ergonomic Parameters</b></p> <p>Washbasin - position and dimensions  Washbasin - shape and adjustment  Placement of the fittings  Ergonomic shape for the customer  Neckline  Comfort mechanics  Massage  Leg rest</p> <p><b>Recommendations</b></p> <ul style="list-style-type: none"> <li>• Upper basin edge height min. 900mm</li> <li>• Distance rear edge of basin to neckline max. 500mm</li> <li>• Sitting washing with substructure-width max. 300mm</li> <li>• Standing washing with foot clearance of min. 200mm from the rear end of the basin</li> <li>• Tilt mechanism with double-sided operation</li> <li>• Comfort mechanisms (electric leg rest, massage ...) with double-sided operation</li> </ul>
<p>R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus</i>,</p>	<p>The length of the backwash units between the neck support and the backside is maximum 43cm. For backwash units with a hollow front this length is maximum 45 cm. Beneath the backwash unit the depth of the knee space is at least 24 cm and the depth of the foot space at least 42 cm, measured from the rear of the backwash unit. If the depths cannot be reached behind the base, then the width of the base is maximum 30 cm, in order for the hairdresser to be able to place the legs at both sides of the base. The foot space beneath the backwash unit is at least 25 cm.</p>

ANKO, FNV MOOI and CNV Vakmensen	Alternative: the mobile hairdresser and self-employed without employees, who cannot install a backwash unit in a living room, is advised to use a mobile backwash unit. It is also possible to let the customers wash their own hair. If the mobile hairdresser does not use a mobile backwash unit, then they should take more breaks, take care of alternation in tasks, change working position and working station.
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## Hairdressing saddle stools

Source	Hairdressing saddle stools
<p>Miet Verhamme, (2015) <i>‘Op-één-haar-na’</i>, <i>Ergonomie voor de startende kapper</i>, transnationaal ESF project, UBK/UCB vzw-asbl</p>	<p>The most backwash units are not adjustable in height forcing the hairdresser to adjust himself to a good working height. For tall hairdressers, it is best to use the saddle stool for washing. Short hairdressers can also work standing. For technical work such as cutting, colouring, placing perms, bleaching it is also best to use a saddle stool.</p> <p>A good saddle stool</p> <ul style="list-style-type: none"> <li>• runs on wheels,</li> <li>• has a rotatable seating,</li> <li>• has a seating which slightly inclines forwards, moving the hips forward to maintain the natural curvature of the back.</li> <li>• is easily adjustable for height,</li> <li>• has a bicycle saddle (if you are short) or a pony saddle (no round cushion!),</li> <li>• does not have a backrest.</li> </ul> <p>Points of attention:</p> <ul style="list-style-type: none"> <li>• By using the saddle stool, the hairdresser can turn around the customer without bending the torso.</li> <li>• Do not slouch on the saddle stool.</li> <li>• You cannot use the saddle stool for all techniques. You will find out soon yourself which are fitting and which aren't.</li> <li>• If you need to overreach too much, go back to a standing position.</li> <li>• Switch between sitting and standing, because changing position is good.</li> </ul>
<p>M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers</i>, <i>Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i>, TNO Arbeid</p>	<ul style="list-style-type: none"> <li>• Highest stance at least 80 cm (Osinga, 1993).</li> <li>• Lowest stance max. 59 cm (Osinga, 1993); min. 55 cm (Petersson, 1984).</li> <li>• Height adjustment through a gas spring (Osinga, 1993).</li> <li>• Height adjustment by foot (Petersson, 1984).</li> <li>• Height variation of min. 25 cm (Petersson, 1984).</li> <li>• Avoid loose spring suspension (Osinga, 1993).</li> <li>• No round cushions (Osinga, 1993 says saddle, at present there are also other shapes available such as pony saddles, of which the effect has not been studied).</li> <li>• seating depth 30 cm (Osinga, 1993). Seating width 35 cm (Osinga, 1993).</li> <li>• Inclination angle should be upwards and downwards adjustable and fixed (inclination seating, rotatable and fixable) (Osinga, 1993).</li> <li>• Saddle rotatable (Osinga, 1993).</li> <li>• Base at least 5 feet, no ring shaped base (Osinga, 1993). Tipping point at least 195 mm (Osinga, 1993).</li> <li>• Length of foot at most 365 mm (Osinga, 1993).</li> <li>• Number in salon should be: (number of employees divided by 2) + 1 (Osinga, 1993; this is a legal requirement).</li> <li>• Wheels of hairdressing saddle stool need to be agile and preferably detachable (Osinga, 1993).</li> <li>• It should possess a user's manual in the language of the hairdresser (Osinga, 1993).</li> <li>• Implementation of working with saddle stools requires a different cutting technique, learning this costs a lot of time.</li> <li>• Use of the saddle stool as much as possible (also during washing), but sit on in an active posture (multiple sources) move the saddle stool with your legs, not by using the pelvis (video 'opknippen of afknippen').</li> </ul>

	<ul style="list-style-type: none"> <li>• Height setting dependent on the length of the hairdresser and the working height: keep legs/knees bent, feet flat on the ground, use the saddle stool as a standing support if you are not sitting (video 'opknippen of afknappen')</li> <li>• Height adjustment by foot</li> <li>• Wheels are blocked by pressing down the saddle stool.</li> </ul>
<p>J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen voor de kapper</i>, Beroepsgebonden Musculoskeletale Aandoeningen, FOD Werkgelegenheid, Arbeid en Sociaal Overleg</p>	<p>b. For the hairdresser :</p> <p>The seat of the hairdresser must make it possible to easily change position between standing and sitting work. It should be easily adjustable in height. Characteristics of a good seat are: • saddle stool or standing support • adjustable in height between at least 54 cm for the lowest stance and 80 cm for the highest stance; • the seat inclines slightly to the front making the hips bend forward a little. That way the natural curvature of the back can be maintained • rotatable seating • limited weight • the adjustment possibilities for the height of the saddle stool are easily accessible</p> <p>Space around the saddle stool</p> <p>Maintain enough free space in front and around the working area. For the feet there should be enough space below the work surfaces and work areas so you can stand closely.</p> <p>For the area around the saddle stool: • at least 70 cm between the stool and the wall • at least 75 cm between 2 saddles stool • at least 100 cm for the working area behind the adjustable hairdressing chair (saddle stool, trolley...)</p>
<p>Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing</i>, presentation, Olymp</p>	<p><b>Ergonomic Parameters</b></p> <ul style="list-style-type: none"> <li>• Ergonomic seat shape</li> <li>• Lower seat height</li> <li>• Height adjustment</li> <li>• Seat tilt, free swinging or infinitely fixable</li> <li>• Backrest</li> <li>• Stability</li> <li>• Rolls</li> </ul> <p><b>Recommendations</b></p> <ul style="list-style-type: none"> <li>• Based on the standard for office chairs SN EN 1335 for stability, strength, durability and safety requirements</li> <li>• Lower Seat height stool max. 500mm</li> <li>• Pump height stool min. 200mm</li> <li>• Rolls with possibility of cleaning</li> </ul>
<p>R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus</i>, ANKO, FNV MOOI and CNV Vakmensen</p>	<p>All hairdresser who wash in the salon at the same time or who do technical actions at the same time, should have the opportunity to use a saddle stool. It should have a cushion shaped as a bicycle saddle or pony saddle. A hairdressing stool with saddle can also be used as a standing support (this is not the case for a pony saddle). It should not have a backrest, unless the backrest promotes an active posture, which is a so called dynamic backrest. It should be easily adjusted without levels. The setting range of the stool is at least 60 to 80 cm above the floor. In specific situation an adapted or tailored saddle stool with a different or greater setting range can be required. The top is rotatable relative to the base. It is rotatable in both directions in an angle of at least 135 degrees around the hairdressing chair. This is the case when the saddle stool is used for working on the floor behind the adjustable hairdressing chair.</p>

	<p>Alternative: if he can't use a saddle stool, the mobile hairdresser is advised to take more breaks, to ensure more alternation in tasks and to change working posture more frequently. This is possible by switching between customers/ driving the car.</p>
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## Hairdryer

Source	Hairdryer
<p>Miet Verhamme, (2015) <i>‘Op-één-haar-na’</i>, <i>Ergonomie voor de startende kapper</i>, transnationaal ESF project, UBK/UCB vzw-asbl</p>	<p>A hairdresser needs to dry hair often. The drying of hair often lasts long and is very tiring for the arms, wrists and hands.</p> <p>A good ergonomic hairdryer:</p> <ul style="list-style-type: none"> <li>• is as light as possible (max. 500 gram),</li> <li>• should be usable for both righthanded and lefthanded employees,</li> <li>• has a cylindrical or oval grip,</li> <li>• has the centre of gravity as close to the grip as possible,</li> <li>• vibrates as little as possible,</li> <li>• is as quiet as possible to avoid hearing problems as much as possible,</li> <li>• is in good condition.</li> </ul> <p>Points of attention</p> <ul style="list-style-type: none"> <li>• Adapt the material to the type of hair</li> </ul>
<p>M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers, Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i>, TNO Arbeid</p>	<ul style="list-style-type: none"> <li>• Weight/point of gravity: light foehn; point of gravity must be in the handline, preferably in the hand itself (Petersson, 1984).</li> <li>• Grip design avoids ulnar flexion and the diameter is designed for hand anthropometrics (chapter 4 of this report).</li> </ul>
<p>J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen voor de kapper</i>, Beroepsgebonden Musculoskeletale</p>	<ul style="list-style-type: none"> <li>• Weight as limited as possible (max.500g)</li> <li>• Cylindrical or oval grip, handgrip is at least 28 cm – at most 38 cm</li> <li>• The point of gravity should be as close to the grip as possible</li> <li>• It should be usable for both righthanded as lefthanded people</li> <li>• Vibrations as limited as possible</li> </ul>

<p>Aandoeningen, FOD Werkgelegenheid, Arbeid en Sociaal Overleg</p>	
<p>Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing, presentation, Olymp</i></p>	<p><b>Ergonomic Parameters</b> Device form Grip surface Handling Weight and weight balance Wattage Air speed in km/h Electric wire Volume <b>Recommendations</b></p> <ul style="list-style-type: none"> <li>• Ergonomic shape</li> <li>• Non-slip surface</li> <li>• One-handed ergonomic handling</li> <li>• Balanced device, max. 600g</li> <li>• AC motor instead of DC motor</li> <li>• Power min. 2000Watt</li> <li>• Air speed min. 100km/h measured at the head</li> <li>• Cable length min. 3m</li> <li>• Volume at the head at 2000W 69dB (A)</li> </ul>
<p>R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus,</i> ANKO, FNV MOOI and CNV Vakmensen</p>	<p>No information</p>

Source	Scissors
Miet Verhamme, (2015) <i>‘Op-één-haar-na’</i> , <i>Ergonomie voor de startende kapper</i> , transnationaal ESF project, UBK/UCB vzw-asbl	<p>Ergonomic scissors avoid pressure being too much on certain parts of the fingers. It is best to determine which scissors you use in function of the size and the shape of the hand and the applied cutting technique.</p> <p>Ergonomic scissors are:</p> <ul style="list-style-type: none"> <li>• is adjusted to right or left handedness,</li> <li>• is adjusted to the size and the shape of the hands,</li> <li>• has a little finger support, limiting the stressing of the joint. The little finger support ensures that your fingers are on a single line and that the scissors are more stable during handling. This relaxes the hand more.</li> <li>• is sharpened and maintained well.</li> <li>• With sharp scissors less force is required.</li> <li>• Possibly you can use a rubber ring.</li> <li>• You don’t see it often but it exists: scissors with movable rings. The advantage is less frequent bending of the wrist. This is healthier. For some actions lightly bent scissors work well.</li> </ul>
M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers, Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i> , TNO Arbeid	<ul style="list-style-type: none"> <li>• Scissors with support for the little finger (chapter 4 of this report).</li> <li>• Scissors with plastic covered grips (Folder: ‘kappersvak gezondheid en milieu’ 1999).</li> <li>• Rotatable scissor grips (Petersson, 1984).</li> <li>• Scissors as light as possible (Petersson, 1984).</li> <li>• Low friction in scissors (Petersson, 1984).</li> </ul>
J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen</i>	<ul style="list-style-type: none"> <li>• adjusted to right or left handedness,, the size and the shape of the hands of the hairdressers (if needed you can use a rubber ring)</li> <li>• with a support for the little finger to limit stress on the joint.</li> <li>• With symmetrical rings to keep the thumb in a neutral position</li> <li>• Regularly maintained by the supplier or knife grinder</li> </ul> <p>Some scissors with specific characteristics allow to keep the wrist in a neutral position during cutting after some practice. They can be used constantly or they can be switched periodically with more conventional scissors with asymmetrical rings.</p>

<p>voor de kapper, Beroepsgebonden Musculoskeletale Aandoeningen, FOD Werkgelegenheid, Arbeid en Sociaal Overleg</p>	
<p>Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing, presentation, Olymp</i></p>	<p>No information</p>
<p>R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus</i>, ANKO, FNV MOOI and CNV Vakmensen</p>	<p>This has support for the little finger (possible removable). The support is placed so that a neutral stance (4 fingers on one line) of the hand is reached. The scissors is nickel free or has a low nickel content. Low nickel content means that it can at most lose 0,5 µg nickel/cm<sup>2</sup>/week. To test if scissors are sharp enough a wet tissue can be cut. If this doesn't work, then the scissors need sharpening. It is recommended to use offset scissors. By the offset position of the rings of the scissors, the tension on the hand muscles and joints reduces and this reduces the chance of overstraining.</p>

Schaar

## Trolley

Source	Trolley
<p>Miet Verhamme, (2015) <i>‘Op-één-haar-na’</i>, <i>Ergonomie voor de startende kapper</i>, transnationaal ESF project, UBK/UCB vzw-asbl</p>	<p>To have tools, products (except for those used at the laboratory) and disposable gloves quickly within hand reaching distance, it is best to use a trolley</p> <p>A good trolley:</p> <ul style="list-style-type: none"> <li>• has caster wheels,</li> <li>• is sufficiently high or is adjustable in height to avoid too much bending forwards.</li> <li>• Use a trolley to have your material close and at the right height.</li> <li>• Put the trolley at the right side. If you are right, place it right as well.</li> </ul>
<p>M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers</i>, <i>Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i>, TNO Arbeid</p>	<ul style="list-style-type: none"> <li>• Movable so material is within hand reaching distance and can easily be put back.</li> <li>• height of cart about 100 cm, at least 80 cm (Petersson, 1984)</li> </ul>
<p>J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen voor de kapper</i>, Beroepsgebonden Musculoskeletale Aandoeningen, FOD</p>	<p>Use trolleys on wheels to prevent lifting your equipment over longer distance (for example for mobile hairdressers)</p>

Werkgelegenheid, Arbeid en Sociaal Overleg	
Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing, presentation, Olymp</i>	No information
R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus,</i> ANKO, FNV MOOI and CNV Vakmensen	No information

## Clipper

Source	Clipper/trimmer
<p>Miet Verhamme, (2015) <i>'Op-één-haar-na'</i>, <i>Ergonomie voor de startende kapper</i>, transnationaal ESF project, UBK/UCB vzw-asbl</p>	<p>A good clipper:</p> <ul style="list-style-type: none"> <li>• is as light as possible (about 300g),</li> <li>• is wireless,</li> <li>• has an oval grip.</li> </ul>
<p>M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers</i>, <i>Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i>, TNO Arbeid</p>	<p>When working with a clipper it is possible to have a bad wrist position because of the design and position of the blades relative to the grip (always about 45 degrees). There is a downward force on the wrist because the weight of the clipper. That is why the mass must be as low as possible.</p> <p>A bad diameter or shape can lead to pressure on the skin or complaints in the hand/lower arm. A cylindrical shape is recommended, with symmetrical rotation, making it so it can easily be turned in the hand. A clipper is usually only used for very short cuttings of the hair, but I can also be used instead of a scissor for longer hair. Because the risks of the scissors are probably larger than those of the clipper, it is recommended to use it where possible. This is also true for hairdressing knives, which are not discussed further here because they are used less frequently. A disadvantage of the long-term use of the clipper is the heating of the machine, which requires extra adjustments for long term use. Possibly the vibrations of the clipper can form a risk as well, but is not known yet what the difference is in vibrations for long-term use. Possible improvements which have not been found are: a rotatable head and the use of a balancer that suspends the clipper.</p>
<p>J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen voor de kapper</i>, Beroepsgebonden Musculoskeletale</p>	<p>Clippers/trimmers:</p> <ul style="list-style-type: none"> <li>• Mass as limited as possible (+/- 300g)</li> <li>• Wireless</li> <li>• Oval grip with an average width of 32 mm (min. 28 mm – max. 38 mm)</li> </ul>

Aandoeningen, FOD Werkgelegenheid, Arbeid en Sociaal Overleg	
Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing, presentation, Olymp</i>	No information
R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus,</i> ANKO, FNV MOOI and CNV Vakmensen	No information

## Hairbrushes

Source	Hairbrushes
<p>Miet Verhamme, (2015) <i>'Op-één-haar-na'</i>, <i>Ergonomie voor de startende kapper</i>, transnationaal ESF project, UBK/UCB vzw-asbl</p>	<p>A good hairbrush:</p> <ul style="list-style-type: none"> <li>• is light to avoid overstraining the hands and the arms, has a sufficiently long grip (at least 11-12cm) and is sufficiently broad (3cm), so that the brush can be held with the entire hand,</li> <li>• doesn't have a gliding grip.</li> </ul>
<p>M. Douwes, B.M. Blatter, S.M. Eikhout, R.E. Bronkhorst, F.P. Michel, D.S.C. Osinga (2001) <i>Rapport fysieke belasting bij kappers</i>, <i>Onderzoek in het kader van het arboconvenant fysieke belasting bij kappers</i>, TNO Arbeid</p>	<p>Particularly for blow-drying brushes are used intensively. That is why the weight of brushes is also important: the lighter, the less taxing it is for the hands/arms. Furthermore, the diameter and the shape of the handle determine the grip. Often the diameter of the handle is so small that (especially for big hands) it should be held with the fingers and not with the entire hand. The latter has the preference, because strength is also required. This means that a diameter of 3 cm is recommended. The handles have different shapes and are made of different material. It is important that the shape and material are chosen to avoid slip, because the brush has to be able to turn easily (slip) but also has to have a stable grip (anti-slip) to use force. For the length of handle the recommendation is that it should be about 11-12 cm. The choice of the diameter of the brush, the type of bristles and the density of the hairs are determined by the desired effect and the hair type. The brushing section is always in the same line as the handle, which seems appropriate considering the use.</p>
<p>J.P. Demaret, F. Gavray, F. Willems (2013) <i>Preventie van musculoskeletale aandoeningen voor de kapper</i>, Beroepsgebonden Musculoskeletale Aandoeningen, FOD</p>	<ul style="list-style-type: none"> <li>• Light to avoid straining the hands and arms.</li> <li>• Form of the handle: at least 11-12 cm long and a diameter of at least 30 mm, in order for the brush to be held with the entire hand.</li> <li>• The handle cannot slide</li> </ul>

Werkgelegenheid, Arbeid en Sociaal Overleg	
Christian Frank, (2018) <i>General conditions and recommendations for ergonomic standardization of salon furnishing, presentation, Olymp</i>	No information
R. Koffijberg, M. Patijn, W. Kruithof (2014) <i>Arbocatalogus,</i> ANKO, FNV MOOI and CNV Vakmensen	No information