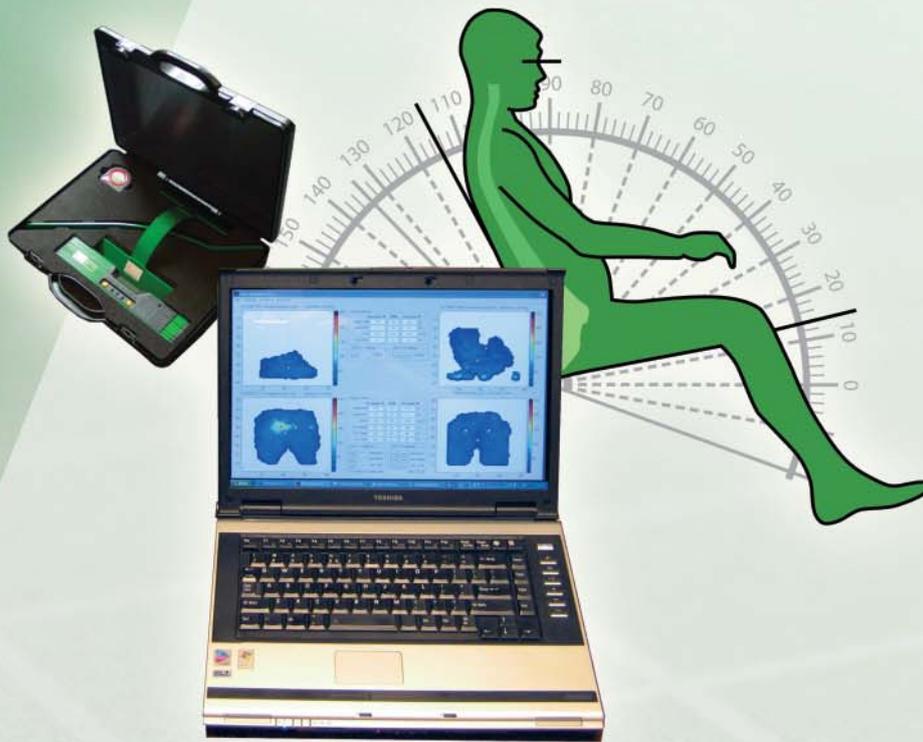


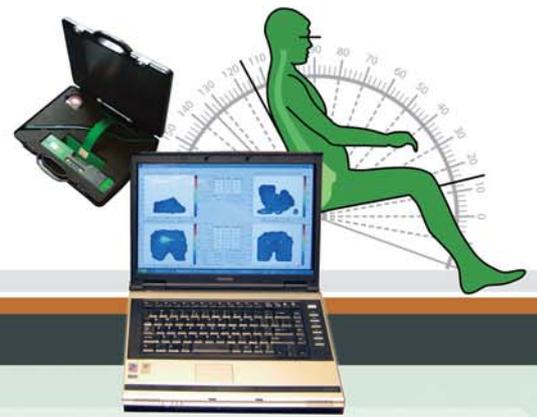
Product information SMS Seating Advice



Are you certain of your seating quality?

- Are you certain that you always provide the most adequate (semi-)permanent wheelchairs?;
- Would you like proper referral and advice based on an objective analysis of the seating situation?;
- Do you to want to improve the quality of policy making as regards the provision of wheelchairs?

SMS Seating Advice provides objective and product independent answers to these questions



The ageing population and the move towards prolonged self-reliance leads to increased costs for the provision of aids. When this concerns provisions under the Dutch Social Support Act (WMO), this means more costs for the local authorities. But no provisions, late provision or provision of the wrong aids for any particular client bring not only even more costs, but, worse still, more problems for the client.

The aim must therefore be to continue to improve the quality of the policy for provisions. This can be achieved by giving more attention to the formulation of requests for provisions, to clarification of individual requests and to the selection and provision of adequate and durable aids.

In what way does SMS Seating Advice offer a solution?

The Social Support Act (WMO) requires local authorities to assist people with limitations as regards the ability to cope independently and to participate in society. One of the tasks for local authorities is the provision of wheelchairs. It is important to chart where the needs lie at an individual level and to orientate the work to those needs. People who rely on a wheelchair for mobility and therefore sit for long periods have special needs for sound body posture and correct support. As you undoubtedly know, optimal seating aids are crucially important to make wheelchairs adequate for this group of (semi-)permanent wheelchair users. There is a compensation principle for the provision of aids: local authorities have to provide an aid that is adequate for the user. In order to achieve an

Cheapest adequate aid:

Cheapest → criterion = price

Adequate → criterion = ?

How do you determine to what extent an aid is adequate?

optimal seating situation for any individual wheelchair user it is necessary to adjust the wheelchair in such a way that the user will be seated with the correct posture angles. Then an analysis must be carried out to see which seat and backrest supports afford the best pressure distribution. If there is then a choice between several adequate aids, the cheapest one is chosen.

Price is a clear and objective criterion.

But, how do you determine to what extent an aid is adequate?

Now, SMS Seating Advice offers you the solution. SMS stands for Sit Measurement System.

For whom was SMS Seating Advice developed?

A survey was held amongst various people who are involved in giving advice on or in providing adapted wheelchairs for daily, long-term use. It showed that there is a need for a way to carry out an objective analysis of seat and backrest supports for use in wheelchairs so that these can be provided effectively and efficiently.

SMS Seating Advice was developed for people involved in giving advice on or in providing adapted wheelchairs for daily, long-term use. This includes, for example, physiotherapists and ergotherapists, consultants and advisors for the Social Support Act, and companies that supply rehabilitation aids.

SMS Seating Advice can be used to define a Set of Requirements, either for selecting ready-made solutions or for fitting someone for an individual seating orthosis. With a measurable and objectively motivated advice report, you can offer clients and their local authorities a personal solution for each individual. Improve the adequacy and durability of wheelchair aids that are provided for (semi-)permanent use and use SMS Seating Advice as a standard support tool for your expertise.

What is the basis of SMS Seating Advice?

SMS Seating Advice is partly based on the results of research carried out by dr.ir. H.A.M. Staarink. In 1995, Staarink, then a researcher for an institute under the Dutch ministry of health, successfully defended his PhD thesis on the quality of wheelchair cushions. During this research he decided to express the pressure distributing quality of a cushion in terms of easily understandable index ciphers. Later, he further developed the insights on how pressure distribution works in cushions and the use of index ciphers that he had gained in that research in analysis software. This analysis software is an integral part of SMS Seating Advice.

From 1996-2005, Staarink, together with J. van Wijngaarden (GP) and A. Tournier (physiotherapist and manual therapist), went on to research measurable criteria for sound individual sitting posture support: for this they developed a multifunctional fitting chair. It was soon shown that specific sitting postures were more similar in the various (very diverse) test subjects than one would initially have expected and that this can readily be explained using biomechanical and (neuro)physiological principles.



Classification of the angles that determine the sitting posture in the sagittal plane

Together with the analysis of normal sitting behaviour in humans, these insights form the basis for conclusions that can be drawn for sound sitting postures and sitting behaviour in wheelchairs. The theory of sitting posture and pressure distribution together with the analysis software comprise SMS Seating Advice.

The list of advantages:

- 1 Improvement in the quality of life for wheelchair users
- 2 Objective analysis of sitting posture and seating support
- 3 Scientifically supported and product independent selection of seat and backrest supports
- 4 Optimal advantages from the chosen aids
- 5 Transparency in determination and evaluation of the standard package

In SMS Seating Advice, sitting posture and the pressure distribution of a seating support are emphatically coupled. A sound sitting posture is a prerequisite for good pressure distribution.

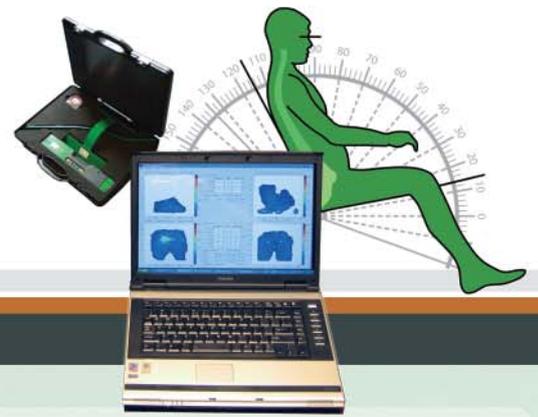
The optimisation of pressure distribution begins with the optimisation of the sitting posture. The basic sitting posture in a wheelchair is a sitting posture with anatomically sound stability in which the back is individually supported.

In the development of SMS Seating Advice we work closely with the ergotherapy department of the Roessingh rehabilitation centre in Enschede in the Netherlands. Two ergotherapists have been using SMS Seating Advice for nearly two years during treatment and when giving advice to their clients. This has had a beneficial effect on the treatment and on the quality of life of their clients.

How does SMS Seating Advice work?

The SMS Seating Advice begins with the optimisation of the sitting posture by measuring the current posture and comparing the results with the values of the angles that constitute a posture that provides anatomically sound stability.

Once the posture has been optimised, the pressure distribution in the seat and backrest support is measured again using a pressure measurement mat. With



this it is possible to measure the pressure distribution of a cushion. A large number of pressure sensors are integrated into the mat and these measure the so-called interface pressure between the buttocks and the cushion.

The aim of pressure distribution is to spread the locally concentrated high load under the bony protrusions in the buttocks, the ischial tuberosities, over a greater area of the buttocks, to actually reduce the load on the tuberosities as much as possible. The lower the load is directly under the ischial tuberosities, the higher the quality of the pressure distribution.

The SMS analysis software was developed on the basis of this principle to be part of the SMS Seating Advice. The software provides a diagrammatic visualisation of the pressure distribution and represents the large quantity of data from the measurements in a few representative index ciphers. These can be used to record the pressure distributing characteristics of a cushion.

On the screen, these index ciphers can be readily compared with the index ciphers from new measurements taken using different seating supports. This makes it possible to determine objectively whether there is any improvement or not.

The analysis software is easy to use as it shows the user very clearly where which data has to be entered. By taking measurements with different sorts of seat and backrest supports it is possible to literally measure which supports provide optimal seating quality for the person in question. The analysis software automatically generates a report of the conclusions.

The quantitative data that is obtained will support your expert judgement to enable you to offer your clients the most adequate personal solutions. Furthermore, SMS Seating Advice also provides insights into individual seating quality to your clients. This will increase their understanding and awareness and therefore enable them to make an active contribution to their own well-being.

At which point in the application procedure can SMS Seating Advice be used?

The sit measurement system will help you define a Set of Requirements (SoR), either for the selection of ready-made solutions or for fitting someone with an individual seating orthosis.

When a Set of Requirements is being defined, the first step is to look at the envisaged use: the human related intended use is charted. In consultation with the client, this information is then reviewed with respect to the necessary product characteristics: the product related use is charted. Finally, armed with this information and with advice from the technicians from the supplier, the cheapest adequate seat and backrest support is selected.

The moment to decide whether the seat and/or backrest need to be adapted for the individual is during the fitting session. A Set of Requirements has been defined and the wheelchair must fulfil these requirements technically if it is to be deemed adequate. However, the actual sitting was probably not taken into account, as the client had not yet 'been sitting'. The client may, of course, already be known to have decubitus or other seating related problems.

During the fitting session, SMS Seating Advice can be used to define this last, but crucial, section of the SoR, to compare various seating solutions or to measure a client for an individual seating orthosis in order for you to be able to select the cheapest adequate solution.

The result of this objective comparison and selection of the cheapest adequate solution leads to the supply of the most optimal and long-lasting solution for the client.

**Standard application procedure
for a wheelchair for
(semi) permanent use:**

Application for a wheelchair

Intake consultation

Wheelchair for (semi) permanent
use prescribed

**Fitting based on the
Set of Requirements (SoR)**

- Decide whether adjustment of the seat and or backrest is necessary or not;
- Decide whether this should be a ready-made solution or an individual seating orthesis:

Ready-made solution

Compare seating facilities in combination with any wheelchair(s) from the standard package

Individual seating orthesis

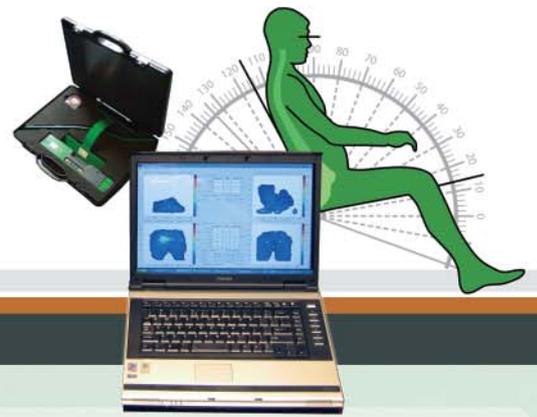
Take necessary measurements

Select the cheapest
adequate solution

**Added value of
SMS Seating Advice within
the application procedure:**

SMS Seating Advice as aid during:

- *Definition of the SoR as regards sitting quality (analysis of sitting posture and pressure distribution);*
- *Objective comparison of the various seating solutions / measurements for individual seating orthesis;*
- *Selection of the cheapest adequate solution;*
- *Supply of optimal and long-lasting wheelchairs*



What are the advantages of using SMS Seating Advice?

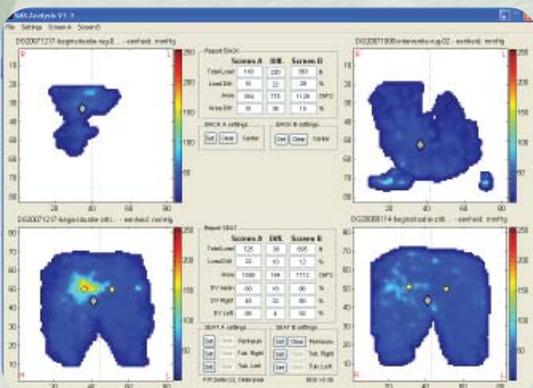
Standard use of SMS Seating Advice will give you the following advantages:

1. Improvement in the quality of life for wheelchair users

PR Sella holds the sincere conviction that people in wheelchairs could sit more optimally. With the help of an innovative sit measurement system, SMS Seating Advice, this is now possible. SMS Seating Advice makes sitting in a wheelchair optimal and long-lasting. Due to the fact that with the help of our sit measurement system the most optimal support can immediately be chosen for an end user, the user will experience a higher level of quality in using the wheelchair and problems related to sitting for long periods will be prevented or relieved.

2. Objective analysis of sitting posture and seating support

SMS Seating Advice is a scientifically supported instrument for selecting the most adequate seat and/or backrest support for an end user. It begins with the optimization of the sitting posture by measuring the current posture and comparing the results with the values that constitute an anatomically sound sitting posture. The pressure distribution of the current seating support is measured and compared with that of other seat and backrest supports.



Comparison using SMS Analysis software

From these measurements, objective ciphers are calculated giving you a measurable quality criterion enabling you to determine which seat and backrest support will provide optimal sitting quality for the person in question.

3. Scientifically supported and product independent selection

SMS Seating Advice offers you certainty, because you will no longer be making choices based only on your own assessment but on the basis of objective measurements based on scientific research. A comparison can be found, for example, with a dentist who uses X-ray photos as an instrument to support his or her treatment.

In a similar way, SMS Seating Advice can help you make scientifically supported and product independent decisions on the price and quality of seat and backrest supports. Trademarks and image will no longer play a role. Now you can select the cheapest adequate solution with certainty.

4. Optimal advantage from the chosen aids

The aging population and a move towards prolonged self-reliance leads to increased costs for the provision of aids.

You can improve the process between the request for a seat and/or backrest support and the final supply of the product, if you include the seat measurement system as part of your existing protocol. You will no longer have to try out supports to 'see how it goes'. The correct support will be supplied first time. For the end user, this means that there is certainty that the seat and/or backrest support that is supplied is the most adequate for him or her. In this way, incorrect or inadequate seat and/or backrest supports will no longer be used which will prevent the continuance – or, worse still, the further aggravation – of the end user's problems.

By carrying out the sit measurement first, the chosen aids will provide more long-lasting use. As a result, the likelihood of a customer returning for a new seat during the life of a wheelchair is considerably

reduced. For the supplier of wheelchairs, this will mean a reduction of costs and optimal advantage/returns from the chosen aids.

5. Transparency in determination and evaluation of the standard package

The sit measurement system can be used as a control instrument in the determination of the standard package:

- which wheelchairs (make and type) always need to have individual adaptations made and which ones do not?
- which standard individual adaptations are successful and which ones are not?

These are important questions with even more important answers necessary to make efficient and effective individual treatment possible at lower cost. By using SMS Seating Advice as a standard part of your referral procedure you will be able to give objective answers to these questions.

What does it cost?

You will need to contact us before you first use SMS Seating Advice because you will need special software for it to be fully operational and to allow the SMS Analysis software to communicate with your interface pressure mat(s).

Once the software has been installed and you have received your username and password, you can carry out measurements at any time you choose.

To do this you simply log in via www.pr-sella.nl by entering your username and password in the appropriate fields at the top of the page. Once you are logged in, the highly user friendly program will guide you step by step through the measuring session. This will result in the individual SMS Seating Advice: a report in which the results of the measuring session are clearly presented and explained.

It will only cost you 75 euros for an SMS Seating Advice session including the report.

What do you need?

In order to use SMS Seating Advice to make your own reports, whether you are giving treatment, making referrals or giving advice, you will need the following equipment:

1. PC or laptop
2. Interface Pressure measuring mat (1 or 2)
3. SMS Analysis software
4. Case with measuring instruments, containing:
 - a. SMS Seating angle bracket
 - b. SMS Backrest inclination strip
 - c. Digital spirit level

Can PR Sella carry out SMS Seating Advice for me?

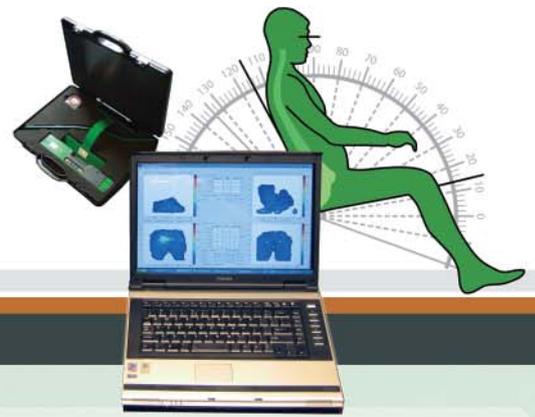
If you do not have all of the necessary equipment for carrying out the SMS Seating Advice procedure, it is also possible for us to do it for you.



SMS Analysesoftware

A measuring session takes about two and a half hours and an advisor from P.R. Sella will come to you to carry this out. The current posture and pressure distribution will be measured and the desired posture and pressure distribution ascertained. Then the wheelchair will be adjusted as optimally as possible. Furthermore, specific and objective advice will be given about providing the most adequate seating for the person measured.

You will receive this report within two workdays after the measuring session.



Technical details

Below you will find information on the technical details of the necessary equipment.

1. PC or laptop

Minimum requirements for the PC or laptop are 2 USB ports and Windows 95 or higher.

2. Interface Pressure measuring mat

In order to carry out your own measurements you will need one or two Interface Pressure measuring mats. Currently there are several makes of interface pressure mats available commercially, such as Tekscan, Xsensor and FSA.

Depending on the type of mat you have, we will provide you with the necessary software, as long as this is available for your type of pressure mat. Then you can enable your pressure mat(s) to communicate with the SMS Analysis software that we have especially developed and tested.

It is important for us to know the type, year of distribution and serial number of your interface pressure mat. If you use the contact form on our website www.pr-sella.nl to send us this information, we will be able to provide you with the correct information. If you do not already have an interface pressure mat and wish to acquire one, you can contact us for advice.

Please fill in the above mentioned contact form and we will then get in touch with you.

You can carry out the measurements using either one or two pressure mats. A pressure mat can be placed either under the buttocks or up against the back. If you use two mats, you can measure the pressure distributing capacity of both the seat and the backrest supports under load, simultaneously. It is entirely up to you whether you use one mat or two.

3. SMS Analysis software

If you wish to carry out your own measuring sessions, you will need software to enable SMS Seating advice and to allow the SMS Analysis software to communicate with your interface pressure mat(s). There will be a one time charge for this which will include our assistance in getting everything up and running and will also cover the first ten measuring sessions you carry out. Once the software has been installed on your computer and you have received your username and password, you can carry out measurements at any time you choose. To do this you simply log in via www.pr-sella.nl by entering your username and password in the appropriate fields at the top of the page. After the first ten sessions, you will be charged a certain price for each session you carry out using the SMS Analysis software.

4. Case with measuring instruments

In order to measure the seating angle and the functional backrest inclination under load, you will use the case with measuring instruments. This case contains the SMS Seating angle bracket, the SMS Backrest inclination strip and the digital spirit level.

The sitting posture angles – the seat angle, angle φ and the functional backrest inclination, angle $(\varphi + \alpha)$ – are defined along the relevant parts of the body when under load. This means that they must be measured 'under load' and along the body.

For this purpose we have developed two simple measuring aids:

- With the aid of the SMS Seating angle bracket, the seat angle, angle φ can be measured.
- With the aid of the SMS Backrest inclination strip, the functional backrest inclination, angle $(\varphi + \alpha)$ can be measured under load. The instrument consists of a metal strip, bent in such a manner that three sections are formed. The end sections are parallel to each other and the middle section is at an angle of 165° to both of them.

- The digital spirit level can be used to read off the values of the angles accurately.

If you would like more information about these measuring instruments and their use, download the document 'Manual of definitions and methods for measuring' from our website www.pr-sella.nl.

Dimensions and weight:

Case:	45x32 cm, 1050 grams
SMS Seating angle bracket:	23x20 cm, 325 grams
SMS Backrest inclination strip:	53x3.5 cm, 155 grams
Digital spirit level:	33x6 cm, 365 grams

The digital spirit level has an accuracy of one hundredth of a degree. A 9V battery is included with the digital spirit level.

The various instruments are available both separately and as a complete package of a case containing the measuring instruments.



Case with measuring instruments

You may also choose to make the SMS Seating angle bracket and the SMS Backrest inclination strip yourself instead of obtaining them from us. You will find the technical specifications for these two measuring instruments on our website.

Garantee and service

The SMS Analysis software is the result of years of research. This software may be revised. We guarantee that we will always put the current and most reliable version of the software at your disposal. The version number of the analysis software used is given with each measuring session. This corresponds with the number of the most recent version of the SMS Analysis software that is stated on the website. In this way, you can be certain that you are using the most recent software for your measuring session.

The quality of the SMS Seating Advice is not only determined by the analysis, but for an equally important proportion by the correct application of the measurement protocols and their analyses. We regularly organize courses for you to familiarize yourself with these. Look at our website to see when the next courses are to be held.

An improved pressure distribution measured either by you yourself or by an employee of PR Sella using the SMS Analysis software does not guarantee the prevention of decubitus. This is because there are many more influencing factors, such as the length of time the person spends sitting, the individual shape of the buttocks and nutrition.

If the measurement protocol is followed correctly and all of the information is provided correctly, the system will provide a measurement report, the SMS Seating Advice report, at the end of the session. You can add your own comments separately.

We give 12 months guarantee on our measuring instruments. In the unlikely event that there is anything wrong with one of our products, you can return this product to us. We will then send you a new product by return, free of charge.

More information

If you have any questions or comments, or if you would like to see a demonstration of the SMS seating advice:

Go to our website www.pr-sella.nl!

For extensive work on sitting and pressure distribution, see the following books:

Staarink, H.A.M. *Zo zit het! Over zitten, stoelen en rolstoelen**, Assen: Van Gorcum. 2007

Asbeck, F.W.A. van (red.). *Handboek dwarslaesie revalidatie*, paragraaf 18.1.1: Biomechanische en (neuro)fysiologische achtergronden van het zitten, tweede herziene druk, Houten: Bohn Stafleu Van Loghum. 2007

*'All there is to know about sitting, sitting behaviour, seats and wheelchairs'. This English translation is in preperation.