



Seat Comfort Questionnaires



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1st edition

Original language: English

© SNCF-VOYAGEURS, Rail Delivery Group (RDG), Deutsche Bahn (DB),
Nederlandse Spoorwegen (NS), Österreichische Bundesbahnen (ÖBB),
Schweizerische Bundesbahnen (SBB)

Paris, London, Munich (München), Utrecht, Vienna (Wien), Bern

September 2020

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Issue Record

Issue	Date	Comments	Source
1.0	June 2020	First Issue	EuroSpec "Seat Comfort Part: Passenger seat ergonomics"

Revision History

Version	Date	Change

1 FOREWORD

This document contains the questionnaires as referenced in SECO.06 and SECO.103 of The EuroSpec Seat Comfort document.

The questionnaires included in this document are voluntary and can be adopted if required.

All questionnaires can be used during multiple phases of a project to determine how discomfort / comfort develops over time.

Each questionnaire contains references to academic works. The EuroSpec Seat Comfort Working Group (WG) highly encourages the study of these academic works for a better understanding of how the questionnaires could, can and should be used.

This WG highly encourages the Railway Industry to adapt and improve upon the mentioned questionnaires.

This document supports the main EuroSpec Seat Comfort document and itself is supported by two Excel Spreadsheets:

- EuroSpec Seat Comfort Management Questionnaire, and
- EuroSpec Seat Comfort Fleet Manager VKM Questionnaire.

2 INTRODUCTION

This document is a voluntary specification, produced by SNCF-VOYAGEURS, Rail Delivery Group (RDG), Deutsche Bahn (DB), Nederlandse Spoorwegen (NS), Österreichische Bundesbahnen (ÖBB) and Schweizerische Bundesbahnen (SBB).

Individual companies may choose to mandate it through internal instructions/procedures or contract conditions.

Purpose of this document

This document provides a voluntary specification for Seat Comfort for use by companies in the rail sector if they so choose.

The purpose of this document is to provide a common specification for Seat Comfort in rolling stock between train operators. This document is to replace individual company specific functional requirements and constitutes a common reference being used for tendering and verification.

Application of this document

- This specification is voluntary. Individual companies may however elect to mandate all or part of its use through company procedures or contract conditions. Where this is the case, the company concerned must specify the nature and extent of application.
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3 QUESTIONNAIRES

3.1 Management questionnaire

This section includes a questionnaire for the train operator to use to decide the parameters to provide to the seat supplier on journey times, postures, etc.

The following table is also available as Excel Spreadsheets.

3.1.1 EuroSpec Seat Comfort: Management Questionnaire

Question	Choice / Data	Unit	Remark
What is the minimum station to station time on the concession / line?		Minutes	
What is the maximum station to station time on the concession / line?		Minutes	
What is the minimum time (P5) a passenger would use a seat?		Minutes	Keep in mind that most people travel to a hub or connecting station.
What is the average time (P50) a passenger would use a seat?		Minutes	Keep in mind that most people travel to a hub or connecting station.
What is the maximum time (P95) a passenger would use a seat?		Minutes	Keep in mind that most people travel to a hub or connecting station.
Determine management ideas regarding minimum comfort and adjustability of seat.			
Are the passengers intended to feel "lucky to have a seat at all"?	Yes / No	Choose	Your service provides a low comfort station to station service without any intention to provide comfort. Think London Metro inner city. Your seat is fixed, not adjustable and one size fit all.
Are the passengers intended to be commuters?	Yes / No	Choose	The type of passengers define the population(s) used for anthropometry, the scientific study of measurements of the human body

Are the passengers intended to be native travellers?	Yes / No	Choose	The type of passengers define the population(s) used for anthropometry, the scientific study of measurements of the human body
Are the passengers intended to be continental travellers?	Yes / No	Choose	The type of passengers define the population(s) used for anthropometry, the scientific study of measurements of the human body
Are the passengers intended to be intercontinental travellers?	Yes / No	Choose	The type of passengers define the population(s) used for anthropometry, the scientific study of measurements of the human body
Are the passengers intended to be native tourists?	Yes / No	Choose	The type of passengers define the population(s) used for anthropometry, the scientific study of measurements of the human body
Are the passengers intended to be continental tourists?	Yes / No	Choose	The type of passengers define the population(s) used for anthropometry, the scientific study of measurements of the human body
Are the passengers intended to be intercontinental tourists?	Yes / No	Choose	The type of passengers define the population(s) used for anthropometry, the scientific study of measurements of the human body
Are the passengers intended to be able to look outside?			
Should the seat be adjustable to be able to look with comfortable back support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat be adjustable to be able to look with comfortable neck support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for

			adjustable features on the seat.
Should the seat be adjustable to be able to look with comfortable arm support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat be adjustable to be able to look with comfortable foot support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Are the passengers intended to be able to sleep?			
Should the seat be adjustable to be able to sleep with comfortable back support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat be adjustable to be able to sleep with comfortable neck support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat be adjustable to be able to sleep with comfortable arm support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat be adjustable to be able to sleep with comfortable foot support?	Yes / No	Choose	The comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.

Should the seat accommodate a sideways seated position while sleeping?	Yes / No	Choose	The contour (shape) of the backrest and seat pan are the result of the number and type of postures a passenger can take in a seat. The more postures that are possible the higher the feeling of passenger comfort.
Should the seat and the adjacent seat accommodate a lying / crouched position while sleeping?	Yes / No	Choose	The sleeping comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat and the adjacent seat be able to be used to support the entire body on the seat pan while sleeping?	Yes / No	Choose	The sleeping comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the opposing seat be able to be used to support feet on the seat pan while sleeping?	Yes / No	Choose	The sleeping comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the opposing seat be able to be used to support feet and lower legs on the seat pan while sleeping?	Yes / No	Choose	The sleeping comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat and the opposing seat be able to be used to support the entire body on the seat pan while sleeping?	Yes / No	Choose	The sleeping comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat.
Should the seat pan be replaced with a bed for sleeping?	Yes / No	Choose	The sleeping comfort level of the seat is dependent on the level of adjustability. Depending on this choice the manufacturer can propose the need for adjustable features on the seat. If the seat is not able to meet the

			comfort level of a bed, than this will affect the coach layout.
Are the passengers intended to be able to interact with the other passengers?			
Should the seat accommodate a sideways seated position while talking to the adjacent passenger?	Yes / No	Choose	The contour (shape) of the backrest and seat pan are the result of the number and type of postures a passenger can take in a seat. The more postures that are possible the higher the feeling of passenger comfort.
Should the seat accommodate upper body contact to facilitate snuggling/cuddling with the adjacent passenger?	Yes / No	Choose	This activity of the passenger will have effects on the adjustability and/or availability of the middle arm rest.
Should the seat accommodate facial contact to facilitate kissing with the adjacent passenger?	Yes / No	Choose	This activity of the passenger will have effects on the adjustability and/or availability of the middle arm rest.
Are the passengers intended to be able to eat and/or drink a beverage?			
Are the passengers intended to be able to drink a cold beverage?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to drink a hot beverage?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to stow a beverage?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to store a beverage?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to eat a cold snack?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.

Are the passengers intended to be able to eat a warm snack?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to stow a snack?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to store a snack?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to use a table for eating and/or drinking a beverage?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to use a plate?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to use cutlery?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to eat a full dinner / meal?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat. When the answer is yes the asset manager should consider a purpose build dining coach.
Are the passengers intended to be able to personally dispose of the containers within arm's length?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to cross the personal space of the other passengers in order to personally dispose of the containers?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to dispose of the containers in a disposal unit located outside arm's length?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to secure the location of a container?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.

Are the passengers expected to be able to read a book / magazine?			
Should the seat include a table to rest the book on?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to stow the book?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers intended to be able to store the book?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to read a book with comfortable back support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to read a book with comfortable neck support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to read a book with comfortable arm support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to read a book with comfortable foot support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers expected to be able to work on a laptop (or mobile device with a keyboard)?			
Should the seat include a table to rest the laptop on?	Yes / No	Choose	It's a laptop, so why need a table? Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to work on a laptop with comfortable back support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to work on a laptop with comfortable neck support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.

Should the seat be adjustable to be able to work on a laptop with comfortable arm support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to work on a laptop with comfortable foot support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to compensate for differences in elbow and hand length?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Are the passengers expected to be able to work on a tablet (or mobile device without a keyboard)?			
Should the seat include a table to rest the tablet on?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to work on a tablet with comfortable back support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to work on a tablet with comfortable neck support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to work on a tablet with comfortable arm support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to work on a tablet with comfortable foot support?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.
Should the seat be adjustable to be able to compensate for differences in elbow and hand length?	Yes / No	Choose	Depending on this choice the manufacturer can propose the need for (adjustable) features on the seat.

3.2 Comfort assessment questionnaires

The following questionnaires are examples of ones used to ask participants in comfort tests their opinions on different aspects. They can be used early on in the process, for selection of a choice of seats or for improvements.

They may be used individually or in multiple in order to create a specific questionnaire for the gaining of information as necessary.

Each has an explanation of what it is trying to achieve and a reference to its origin to allow further reading.

3.2.1 Comfort scale from 1 to 10

A ten point-Borg scale can be used to assess discomfort (ranging from 'No Discomfort' at 0 and 'Extreme Discomfort' at 10). This method is in fact applied many times, sometimes a 7 point Likert scale or 5 point is used. An example of the 5 point scale can be found in Bazley et al. (2015). In this case the question on comfort was asked three times. A set of survey questions for a Likert scale rating, 1-5 (1, excellent to 5, very bad), asked about physical, psychological, and emotional comfort at different times at the day to study comfort patterns. An examples of applications of the 10 point scale can be found in Vink et al. (2012) and Lille et al. (2016).

What is the comfort rating of your last journey, circle the correct value (0-10; 0 = lowest rating, 10 = highest)?

No comfort extreme comfort
0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

What is the discomfort rating of your last journey, circle the correct value (0-10; 0 = no discomfort; 10 = highest)?

no discomfort extreme discomfort
0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

Comfort scale 1-10

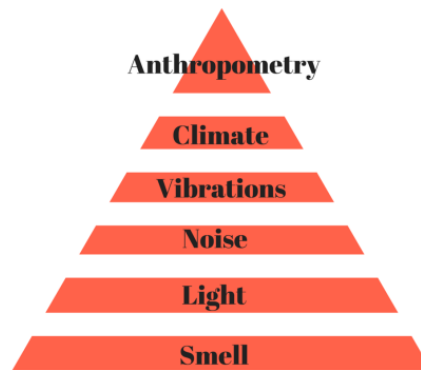
References:

- Bazley C, Nugent R, Vink P. Patterns of Discomfort. J of Ergonomics 2015, 5:1
- Lille, C. de, Santema, S., Bouwens, J., Schultheis, U., Vink, P. 2016. Designing the compartment interior knowing high and low peaks in a passenger flight. AEGATS conference, AEGATS2016_48 on stick
- Vink P, Bazley C, Kamp I, Blok M. 2012. Possibilities to improve the aircraft interior comfort experience. Applied Ergonomics 43: 354-359.

3.2.2 Environmental factors related to comfort

Different factors related to discomfort to set priorities. In this case the posture sleeping is taken.

The factors are based on studies of Bubb (2008): seat, temperature, vibrations, noise, light, smell.



Pyramid of Bubb (2018) showing the importance of the factors related to discomfort.

The questionnaire:

What factor is most important when sleeping?

- Noise - Possibility to reduce compartment noise
- Seat - Adjustable seat to match personal body measurements

What factor is most important when sleeping?

- Seat - Adjustable seat to match personal body measurements
- Light - Control the intensity and colour of the light

What factor is most important when sleeping?

- Smell - Possibility to reduce bad odours in the train compartment
- Seat - Adjustable seat to match personal body measurements

What factor is most important when sleeping?

- Noise - Possibility to reduce compartment noise
- Temperature - Manipulate temperature to personal preference

What factor is most important when sleeping?

- Temperature - Manipulate temperature to personal preference
- Vibrations - Control vibrations caused by the train

What factor is most important when sleeping?

- Light - Control intensity and colour of the light
- Temperature - Manipulate temperature to personal preference

What factor is most important when sleeping?

- Temperature - Manipulate temperature to personal preference
- Smell - Possibility to reduce bad odours in the train compartment

What factor is most important when sleeping?

- Vibrations - Control vibrations caused by the train
- Noise - Possibility to reduce compartment noise

What factor is most important when sleeping?

- Seat - Adjustable seat to match personal body measurements
- Temperature - Manipulate temperature to personal preference

What factor is most important when sleeping?

- Seat - Adjustable seat to match personal body measurements
- Vibrations - Control vibrations caused by the train

What factor is most important when sleeping?

- Noise - Possibility to reduce compartment noise
- Light - Control intensity and colour of the light

What factor is most important when sleeping?

- Smell - Possibility to reduce bad odours in the train compartment
- Noise - Possibility to reduce compartment noise

What factor is most important when sleeping?

- Vibrations - Control vibrations caused by the train
- Light - Control intensity and colour of the light

What factor is most important when sleeping?

- Vibrations - Control vibrations caused by the train
- Smell - Possibility to reduce bad odours in the train compartment

What factor is most important when sleeping?

- Light - Control intensity and colour of the light
- Smell - Possibility to reduce bad odours in the train compartment

References:

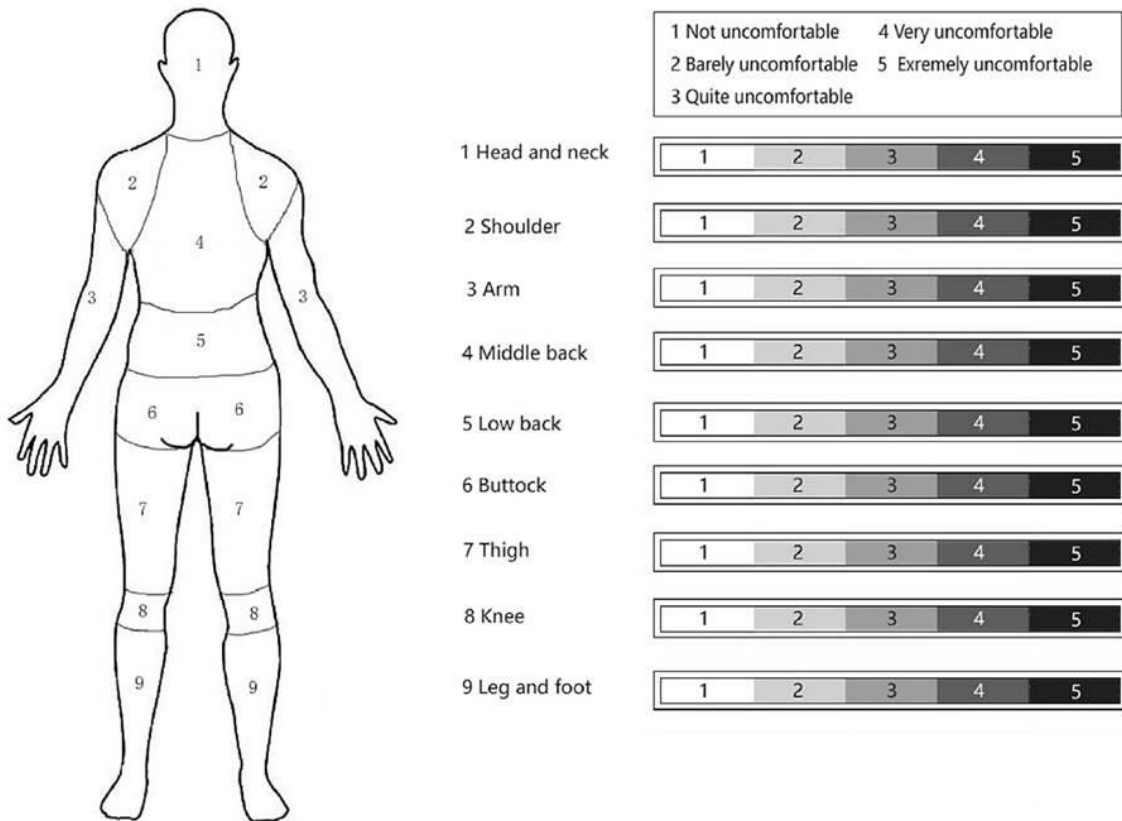
Bubb, R. (2008). Sitting Comfort. Paper presented at IQPC aircraft interior innovation. 11 November 2008. Hamburg.

3.2.3 Body part discomfort scale

The Body Part Discomfort Scale is a subjective discomfort rating method which can be applied to identify areas of discomfort.

This questionnaire can be used during any phase of the development process of a seat.

Repeated evaluation during the development of a seat can show if the discomfort is decreased after making changes to a seat.



The diagram illustrates the Body Part Discomfort Scale. It features a human figure with nine numbered regions: 1 (Head and neck), 2 (Shoulder), 3 (Arm), 4 (Middle back), 5 (Low back), 6 (Buttock), 7 (Thigh), 8 (Knee), and 9 (Leg and foot). To the right of the figure is a legend and a list of rating scales for each region. The legend defines the scale: 1 Not uncomfortable, 2 Barely uncomfortable, 3 Quite uncomfortable, 4 Very uncomfortable, and 5 Extremely uncomfortable. Each region has a corresponding 5-point scale bar with the numbers 1 through 5.

Region	1	2	3	4	5
1 Head and neck	1	2	3	4	5
2 Shoulder	1	2	3	4	5
3 Arm	1	2	3	4	5
4 Middle back	1	2	3	4	5
5 Low back	1	2	3	4	5
6 Buttock	1	2	3	4	5
7 Thigh	1	2	3	4	5
8 Knee	1	2	3	4	5
9 Leg and foot	1	2	3	4	5

References:

Corlett, E.N., Bishop, R.P., 1976. A technique for assessing postural discomfort. *Ergonomics* 19, 175-182.

Friedman, H.H., Amoo, T., 1999. Rating the rating scales. *J. Mark. Manag.* 9, 114-123

Wenhua Li, Suihuai Yu, Haicheng Yang, Huining Pei, Chuan Zhao, 2017, Effects of long- duration sitting with limited space on discomfort, body flexibility, and surface pressure, *International Journal of Industrial Ergonomics* 58: 12-24

3.2.4 Method cp50

CP-50 category partitioning scale is described by Shen and Parsons (1997) and used, for instance, by Franz (2010) and Mergl et al. (2005).

In this method, subjects are asked to state a number from 0-50 that matches their feeling after sitting for a certain amount of time.

A score from 1-10 indicates very slight discomfort, 11-20 slight discomfort, 21-30 medium discomfort, 31-40 severe discomfort, and 41-50 very severe discomfort.

Scores of 51 and 52 are for anything exceeding this

52	
51	
50	very severe discomfort
49	
48	
47	
46	
45	
44	
43	
42	
41	
40	severe discomfort
39	
38	
37	
36	
35	
34	
33	
32	
31	
30	medium discomfort
29	
28	
27	
26	
25	
24	
23	
22	
21	
20	slight discomfort
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	very slight discomfort
9	
8	
7	
6	
5	
4	
3	
2	
1	
0	

References:

Franz M. 2010. Comfort, experience, physiology and car seat innovation, PhD thesis, Delft University of Technology.

Mergl C, Klendauer M, Mangen C, Bubb H, 2005. Predicting Long Term Riding Comfort in Cars by Contact Forces between Human and Seat. SAE, Warrendale. Technical Paper No. 2005-01-2690.

Shen W, Parsons KC, 1997. Validity and reliability of rating scales for seated pressure discomfort. International Journal of Industrial Ergonomics 20: 249-461

3.2.5 Method LPD

This method may be old, but it is still useful in seat testing and used, for instance, by Bronkhorst and Krause (2005) and Groenesteijn (2015).

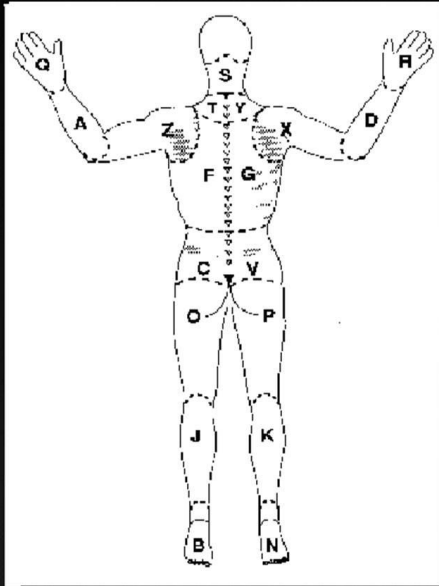
In this method, subjects are first taught the Borg scale (0-10) (Borg, 1999). They are asked to hold a 1 kg weight in a horizontally extended arm. At first, they feel very little discomfort. As time goes by, this moves up the scale towards extreme discomfort, until the point at which they can no longer hold the weight (=10).

The subjects are then shown a body map containing 12 regions, and asked to put a score in the regions where they feel discomfort (Van der Grinten and Smitt, 1992). Usually, the shoulder region receives a score of 10.

The advantage of this method is that it reveals the location of the areas to be improved, which provides input for redesign.

The method is not useful for short sessions (less than an hour), however, as it takes time for discomfort to be noticed, especially in well-designed seats.

Localised Postural Discomfort



0	= no discomfort at all
0.5	= extremely little discomfort (hardly noticeable)
1	= very little discomfort
2	= little discomfort
3	= moderate discomfort
4	= somewhat high discomfort
5	= high discomfort
6	
7	= very high discomfort
8	
9	
10	= extreme discomfort (almost maximum)

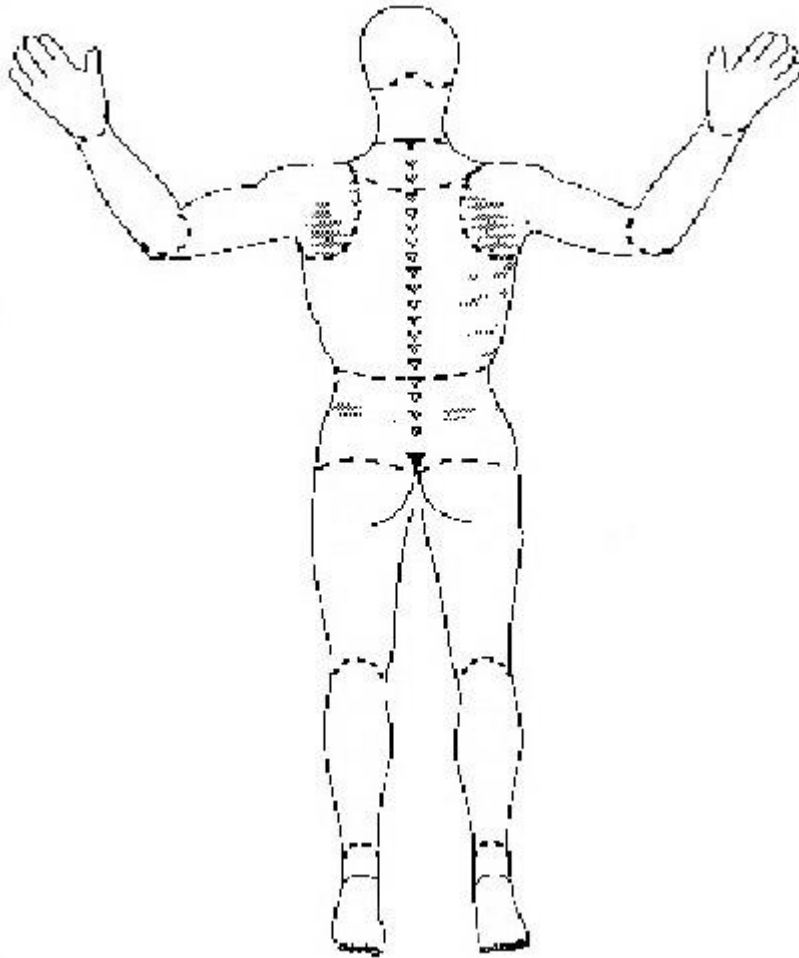
References:

Bronkhorst RE, Krause F . 2005. Designing comfortable passenger seats. in: Vink P, ed. *Comfort and Design: Principles and Good Practice*. Boca Raton: CRC Press: 155-168

Grinten MP van der, Smitt P. 1992. Development of a practical method for measuring body part discomfort. In: Kumar, S. (Ed.), *Advances in Industrial Ergonomics and Safety IV*. Taylor & Francis, London, 311–318.

Groenesteijn L. 2015. *Seat design in the context of knowledge work*. PhD thesis, TU-Delft.

3.2.6 Method red discomfort / green comfort body map



Use the product and put a red cross in regions where you experience discomfort after use and put a green cross in regions where you experience comfort.

References:

Van Veen S, 2016. Driver vitalization. Investigating sensory stimulation to achieve a positive driving experience. TU-Delft. PhD thesis, Delft.

Hiemstra-van Mastrigt, S. (2015). Comfortable passenger seats: Recommendations for design and research. Delft: Suzanne Hiemstra-van Mastrigt. doi.org/10.4233/uuid:eedd25e6-c625-45e9-9d32-f818aa89c19d (Section 5.3)

3.2.7 Method shackle comfort

Shackle comfort questionnaire (Shackel et al., 1969):

Scale statement	Scale	Position
feel completely relaxed	1	
feel perfectly comfortable	2	
feel quite comfortable	3	
feel barely comfortable	4	
feel uncomfortable	5	
feel restless and fidgety	6	
feel cramped	7	
feel stiff	8	
feel numb (or pins & needles)	9	
feel sore and tender	10	
feel unbearable pain	11	

Used by Osborne & Clark, 1975.

References:

Osborne, D.J. and M.J. Clarke, 1975. Questionnaire surveys of passenger comfort, *Applied Ergonomics* 1975, 6.2, 97-103

Shackel, B., Chidsey, K.D., and Shipley, P., 1969 The assessment of chair comfort. *Ergonomics*, 12: 269-306.

	Scale from ... to...	Scale					
		1	2	3	4	5	6
What are your expectations regarding the comfort of this chair?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
What influences might this chair have on your health?	1 very positive - 5 very negative	Very positive	Positive	None	Negative	Very negative	-
How much would you like to have this chair?	1 strongly willing - 6 strongly unwilling	Strongly willing	Willing	Rather willing	Rather unwilling	Unwilling	Strongly unwilling
Discomfort (evening-morning)	1 none - 2 light - 3 middle - 4 strong	None	Light	Middle	Strong	-	-
How do you assess the comfort of this chair?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How safe do you feel while sitting on this chair?	1 very safe - 6 very unsafe	Very save	Save	Rather save	Rather unsafe	Unsafe	Very unsafe
Does this chair assist your physical well-being?	1 applicable - 3 not applicable	Applicable	Applicable in parts	Not applicable	-	-	-
What influences will have this on your work performance?	1 very positive - 5 very negative	Very positive	Positive	None	Negative	Very negative	-
On which level did you percieve the mobility of the seat pan?	1 very obvious = 4 not at all	Very obvious	Obvious	Little	Not at all	-	-
How do you like the mobility of the seat pan?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How do you like the overall dynamics and movement of this chair?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How did the chair dynamics influence the exercise of your job?	1 very positive - 5 very negative	Very positive	Positive	None	Negative	Very negative	-
To what extend is this chair adjustable accoring to your wishes?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How do you evaluate the overall comfort of the seat pan?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad

How do you like the hardness of the seat cushion?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How do you like the uniformity with which the seat pan supports you?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How do you evaluate the overall comfort of the backrest?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How do you like the hardness of the backrest cushion?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How do you like the uniformity with which the backrest supports you?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
How do you access the comfort of the armrest?	1 very good - 6 very bad	Very good	Good	Rather good	Rather bad	Bad	Very Bad
Did you use the armrest during your working time?	1 always - 4 not at all	Always	Most of the time	Just a little	Not at all	-	-
Do you like the look of this chair?	1 yes, very much - 6 no, not at all	Yes, very much	Yes	Rather yes	Rather no	No	No, not at all
How long the backrest was flexibly adjusted today? (daily protocol)	1 always - 4 not at all	Always	Most of the time	Just a little	Not at all	-	-
Did you adjust the backrest flexibility?	1 always - 4 not at all	Always	Most of the time	Just a little	Not at all	-	-

References:

Ellegast, R.P., Keller, K., Hamburger, R., Berger, H., Krause, F., Groenesteijn, L., Blok, M., Vink, P., 2008. Ergonomische Untersuchung besonderer Büroarbeitsstühle. Deutsche Gesetzliche Unfallversicherung (DGUV), Sankt Augustin. BGIA-Report 5/2008.

Groenesteijn, Liesbeth, Rolf Ellegast, Kathrin Keller, Helmut Berger, Peter Vink, In: Vink P, Kantola J, Eds. Advances in Occupational, Social and Organizational Ergonomics. Boca Raton (etc.): CRC Press, 2010: Pages 452-461

3.2.9 Feeling of discomfort

Feelings of discomfort:

Please indicate for the discomfort factors below how you feel on a scale from 1 to 7 (1= not at all, 7= extremely).

1. I feel stiff						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

2. I feel uneven pressure from my seat						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

3. I feel tired						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

4. Part(s) of my body feel numb						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

5. I feel uncomfortable						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

Feelings of comfort:

Please indicate for the comfort factors below how you feel on a scale from 1 to 7 (1= not at all, 7= extremely)

6. I feel relaxed						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

7. I feel refreshed						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

8. The seat feels soft						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

9. I feel fit						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

10. I feel comfortable						
<i>Not at all</i>			<i>Extremely</i>			
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7

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EuroSpec

“EuroSpec” stands for European Specifications for railway rolling stock. The activity is an initiative of several European train operating companies (TOC). The main focus is on trains consisting of self-propelled carriages, using electricity as the motive power (EMU).

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September 2020