ERGONOMIC QUALITY OF AESCULAP Aicon® STERILE CONTAINERS AND BASKETS

SCIENTIFIC INFORMATION

From an ergonomic point of view, the following design criteria of sterile containers and baskets are of particular importance^{1,2,3}:



Shape and function of handle and closure concept



Low operating forces



Intuitive and easy to use (DIN 9241-210)



Low level of noise when using the sterile containers (DIRECTIVE 2003/10/EC)

AIM OF A PRESENT RESEARCH⁴

Testing the new AESCULAP Aicon® container and basket under established ergonomic parameters

Comparison with the previous version / generation

Analyzing benefits tested by ergonomics consultants and real users

METHODS

Splitting in two studies:



Expert study

(n=6, ergonomic experts of IAD-(Institute of Ergonomics of the Technical University Darmstadt), subjective assessment via questionnaire)



User study

(n=15, from Darmstadt Hospital, CSSD and OR employees, subjective assessment via questionnaire and objective assessment)

OBJECTIVE ASSESSMENT / MEASUREMENT METHODOLOGY



Electromyography

Direct measurements of muscle strain



One dimensional force measurement needed for opening and closing



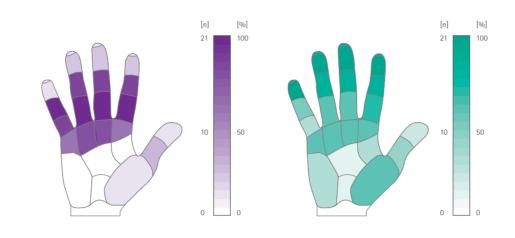
Sound level meter

To measure equivalent continuous noise level and maximal sound pressure level

STUDY RESULTS

1. Subjective results – CONTAINER

Hand pressure mapping*



Previous and AESCULAP Aicon® container show totally different grip types and pressure burden when they are transferred from one place to another. * Results based on expert- / user study

Perception of ergonomic handling

The distance between handles was reduced.

60 cm (AESCULAP Aicon® container)

66.5 cm (Previous container)

Better control over the container

Use of palm and thumb for better guidance possible

Easy accessibility of the rear handle

2. Subjective results - BASKET

Dimensions



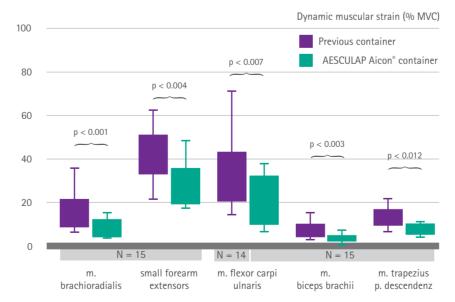
The dimensions of the handles are significantly improved from an ergonomic point of view, users and experts rate the dimensions compared to the previous version as exactly right.



3. Objective results

Electromyography

Muscular strain needed for opening and closing is lower with the AESCULAP Aicon® container.



Force needed for opening and closing (via AndiLog system)

Needed **force** for 240 opening and closing events a day is less than it was needed with the previous version and is ergonomically harmless.5

Sound pressure level while transporting, opening / closing

In both tested cases the new container system made less noise:

Transfer of container to another place

(Previous vs. AESCULAP Aicon®



AESCULAP Aicon® container

-12%

Tractive force for opening

Previous version AESCULAP Aicon®

8.9 N

Opening / Closing

(Previous vs. AESCULAP Aicon®

of container

AESCULAP Aicon container

-10%

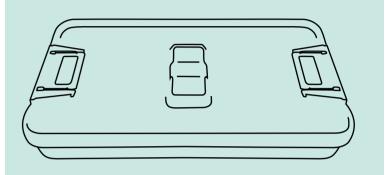
Compressive force for closing



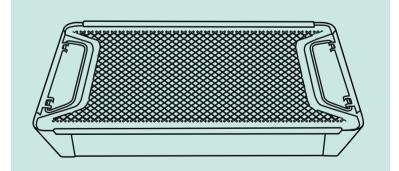


CONCLUSION

The handling of the AESCULAP® sterile container and baskets of the AESCULAP Aicon® series is more ergonomic and offers advantages:



- Particularly positive is the ergonomic design of the opening mechanism of the container. This has also been confirmed by users in relevant studies.6
- Similarly, the significantly lower noise of the AESCULAP Aicon® container during use is a very positive feature of the new container generation.6



The gripping and holding conditions of the AESCULAP Aicon® basket are also very good.6

- 1 Deutsches Institut für Normung e.V.: DIN 33402-2 Ergonomie Körpermaße des Menschen.
- 2 Deutsches Institut für Normung e.V.: DIN 58952-3 Sterilisation Transportkörbe für Sterilbarrieresysteme - Teil 2: Sterilisierkörbe aus Metall.
- 3 Deutsches Institut für Normung e.V.: DIN EN 868-8:2019-03 Verpackungen für in der Endverpackung zu sterilisierende Medizinprodukte.
- 4 Ergonomische Beurteilung von Sterilcontainern und Siebkörben, Institut für Arbeitswissenschaft der Technischen Universität Darmstadt, Forschungsauftrag der Aesculap AG, 2019. 5 Wakula, J.; Berg, K.; Schaub, K.; Bruder, R.; Glitsch, U.; Ellegast, R.P. (2009):
- Der montagespezifische Kraftatlas (BGIA-Report 3/2009). Hrsg.: Deutsche Gesetzliche Unfallversicherung (DGUV), Berlin 2009. 6 Gutachten zur ergonomischen Qualität der AESCULAP® Sterilcontainer der AESCULAP® Aicon®-
- Serie; Prof. Dr.-Ing. Ralph Bruder; Institut für Arbeitswissenschaft der TU Darmstadt,