Instruction manual

Cellspin® (THARMACspin) Cytocentrifuge

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CE IVD

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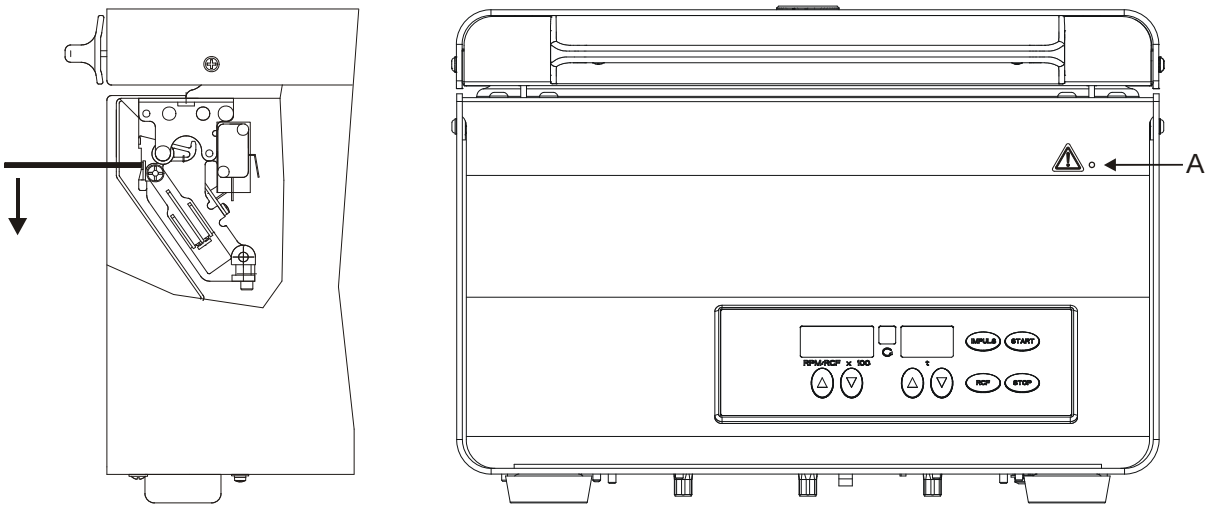


Fig. 1

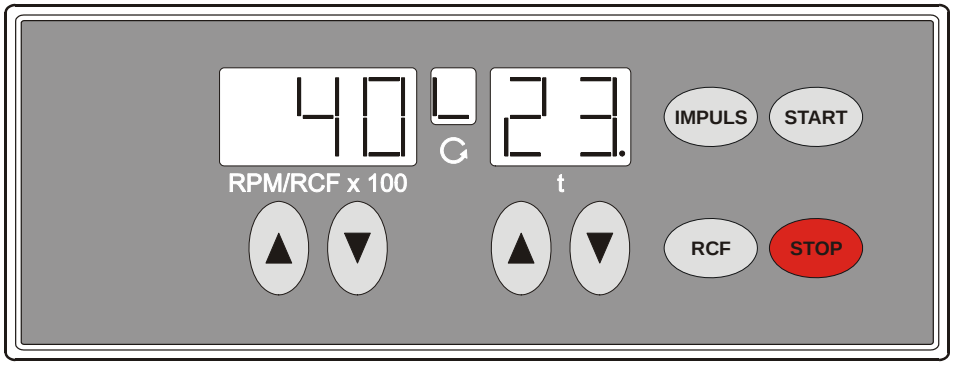


Fig. 2 *Cellspin*® I

1 Use according to specification

This device is a medical product (laboratory centrifuge) within the context of the IVD Directive 98/79/EC.

The centrifuge was designed only for the separation of materials or mixtures with a density of no more than 1.2 kg/dm³. In particular, these include samples for preparation of in-vitro diagnostic purposes in human medicine.

The centrifuge is only meant for this purpose.

Another use or one which goes beyond this, is considered to be non-intended. The company THARMAC® GmbH is not liable for damage resulting from this.

Observing all information in the operating instructions and complying with the measures described therein is also a part of the intended use.

2 Remaining risks

The device is built according to the state-of-the-art and the recognized safety regulations. If used and handled improperly, there could be life-threatening danger to the user or third parties, or the device could be impaired or there could be other property damage. The device is only to be used for its intended purpose and only when it is in safe working condition.

Malfunctions which could affect safety must be corrected immediately.

3 Technical specifications

Manufacturer	THARMAC® GmbH D-35647 Waldsolms	
Model	Cellspin® I	
Type	1206-18	1206-19
Mains voltage (± 10%)	208 – 240 V 1~	100 – 127 V 1~
Mains frequency	50 – 60 Hz	50 – 60 Hz
Connected load	300 VA	300 VA
Current consumption	1.4 A	3.0 A
Max. capacity	4 x 100 ml / 32 x 15 ml	
Allowed density	1.2 kg/dm³	
Speed (RPM)	6000	
Force (RCF)	4226	
Kinetic energy	3160 Nm	
Obligatory inspection (BGR 500)	no	
Ambient conditions (EN / IEC 61010-1)		
– Set-up site	Indoors only	
– Altitude	Up to 2000 m above sea level	
– Ambient temperature	2°C to 40°C	
– Humidity	Maximum relative humidity 80% for temperatures up to 31°C, linearly decreasing to 50% relative humidity at 40°C.	
– Excess-voltage category (IEC 60364-4-443)	II	
– Pollution degree	2	
Device protection class	I	
Not suitable for use in explosion-endangered areas.		
EMC – Emitted interference, Interference immunity	EN / IEC 61326-1, Class B	FCC Class B
Noise level (dependent on rotor)	≤ 57 dB(A)	
Dimensions		
– Width	366 mm	
– Depth	430 mm	
– Height	257 mm	
Weight	23 kg	

4 Notes on safety

No claim of warranty will be considered by the manufacturer unless ALL instructions in this manual have been followed.

- **The centrifuge should be installed on a good, stable base.**
- **Before using the centrifuge absolutely check the rotor for firm placement.**
- **When the centrifuge is running, according to EN / IEC 61010-2-020, no persons, dangerous substances or objects may be within the safety margin of 300 mm around the centrifuge.**
- **Rotors, suspensions and accessories that possess traces of corrosion or mechanical damage or if their term of use has expired may not be used any longer.**
- **The centrifuge may no longer be put into operation when the centrifuging chamber has safety-related damages.**
- **With swing-out rotors the trunnions must be regularly lubricated in order to ensure consistent swinging out of the hangers.**
- **For centrifuges without temperature control, when the room temperature is increased and/or if the device is frequently used, the centrifuging chamber could be heated up. Therefore, it can't be ruled out that the sample material might be changed due to the temperature.**

- **Before the initial operation of your centrifuge you should read and pay attention to the operating instructions. Only personnel that has read and understood the operating instructions are allowed to operate the device.**
- Along with the operating instructions and the legal regulations on accident prevention, you should also follow the recognised professional regulations for working in a safe and professional manner. These operating instructions should be read in conjunction with any other instructions concerning accident prevention and environmental protection based on the national regulations of the country where the device is to be used.
- This centrifuge is a state-of-the-art piece of equipment which is extremely safe to operate. However, it can lead to danger for users or others if used by untrained staff, in an inappropriate way or for a purpose other than that it was designed for.
- The centrifuge must not be moved or knocked during operation.
- In case of fault or emergency release, never touch the rotor before it has stopped turning.
- To avoid damage due to condensate, when changing from a cold to a warm room the centrifuge must either heat up for at least 3 hours in the warm room before being connected to the mains, or run hot for 30 minutes in the cold room.
- The centrifuge rotor may only be loaded in accordance with the chapter "Loading the rotor".
- When centrifuging with maxim revolutions per minute the density of the materials or the material mixtures may not exceed 1.2 kg/dm^3.
- The centrifuge may only be operated when the balance is within the bounds of acceptability.
- The centrifuge may not be operated in explosion-endangered areas.
- The centrifuge must not be used with:
  - inflammable or explosive materials
  - materials that react with one another producing a lot of energy.

- If users have to centrifuge hazardous materials or compounds contaminated with toxic, radioactive or pathogenic micro-organisms, they must take appropriate measures.
  For hazardous substances centrifuge containers with special screw caps must strictly be used. In addition to the screw cap centrifuge containers, for materials in hazard category 3 and 4 a closed rotor must be used (see the World Health Organisation's "Laboratory biosafety Manual").
  In a closed rotor, droplets and aerosols are prevented from escaping by a bioseal (packing ring).
  If the hanger of a closed rotor is used without the lid, the packing ring must be removed from the hanger in order to prevent the packing ring from being damaged during the centrifugation run. Damaged packing rings must not be used to seal the closed rotor.
  Without the use of a closed rotor the centrifuge is not microbiologically sealed in the sense of the EN / IEC 610101-2-020 standard.

- The centrifuge must not be operated with highly corrosive substances which could impair the mechanical integrity of rotors, hangers and accessories.
- Repairs must only be carried out by personnel authorised to do so by the manufacturer.
- Only original spare parts and original accessories licensed by THARMAC® GmbH.

- The following safety regulations apply:
  EN / IEC 61010-1 and EN / IEC 61010-2-020 as well as their national deviations.
- The safe operation and reliability of the centrifuge can only be guaranteed if:
  - the centrifuge is operated in accordance with the operating instructions,
  - the electrical installation on the site where the centrifuge is installed conforms to the demands of EN / IEC stipulations,
  - the tests for device safety required in the respective countries, e.g. in Germany in acc. with BGV A1 and BGR 500, are carried out by an expert.

5 Symbol meanings

Symbol on the device:

Attention, general hazard area.
Before using the device, make sure you read the operating instructions and observe the safety information!

Symbol in this document:

Attention, general hazard area.
This symbol refers to safety relevant warnings and indicates possibly dangerous situations.

The non-adherence to these warnings can lead to material damage and injury to personal.

Symbol on the device and in this document:

Beware of biohazard.

Symbol in this document:

This symbol refers to important circumstances.

Symbol on the device and in this document:

Symbol for the separate collection of electric and electronic devices according to the guideline 2002/96/EG (WEEE). The device belongs to Group 8 (medical devices).

Applies in the countries of the European Union, as well as in Norway and Switzerland.

6 Delivery checklist

The following items and accessories are delivered with the centrifuge:

1	Connecting cable
2	Fuses
1	Hex. pin driver
1	Release pin
1	Notes on moving the equipment safely
1	Operating instructions
1	Lubricating grease for trunnions

The rotor(s) and associated accessories are included in the delivery in the quantity.

7 Unpacking the centrifuge

- Lift the carton upward and remove the padding.
- 

  Do not lift by the handle rail.

  Observe the weight of the centrifuge, refer to chapter "Technical specifications".

  Lift the centrifuge on both sides with an appropriate number of helpers and place it on the laboratory table.

8 Initial operation

- According to the laboratory instrument standards IEC 61010-2-020 an emergency switch to separate power supply in the event of a failure must be installed in the building electrical system.
  This switch has to be placed remote from the centrifuge, prefered outside of the room in which the centrifuge is installed or near by the exit of this room.
- Remove the transportation safety device from the bottom of the housing, see sheet "Transportation safety device".
- **Position the centrifuge in a stable and level manner in a suitable place. During set-up, the required safety margin of 300 mm around the centrifuge is to be kept according to EN / IEC 61010-2-020.**

  When the centrifuge is running, according to EN / IEC 61010-2-020, no persons, dangerous substances or objects may be within the safety margin of 300 mm around the centrifuge.
- Do not place any object in front of the ventiduct.
  Keep a ventilation area of 300 mm around the ventiduct.
- Check whether the mains voltage tallies with the statement on the type plate.
- Connect the centrifuge with the connection cable to a standard mains socket. For connection ratings refer to Chapter "Technical specifications".
- Turn on the mains switch. Switch position "I".
  The last used centrifuge data will be displayed.
- Open the lid.

9 Opening and closing the lid

9.1 Opening the lid

The lid can only be opened when the centrifuge is switched on and the rotor is at rest. If it cannot be opened under these circumstances, see the section on “Emergency release”.

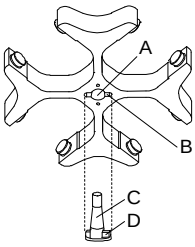
- Swing handle rail on the lid upwards. The symbol "⌞" (lid open) illuminates in the rotation indicator.
- Open the lid.

9.2 Closing the lid

Do not bang the lid shut.

- Place the lid and swing handle rail on the lid downward. The symbol "⎽" (lid closed) illuminates in the rotation indicator.

10 Installation and removal of the rotor



- Clean the motor shaft (C) and the rotor drilling (A), and lightly grease the motor shaft afterwards. Dirt particles between the motor shaft and the rotor hinder a perfect seating of the rotor and cause an irregular operation.
- Place the rotor vertically on the motor shaft. The motor shaft dog (D) has to fit in the rotor slot (B). The alignment of the groove is labelled on the rotor.
- Tighten the rotor tension nut with the supplied wrench by turning in a clockwise direction.
- Check the rotor for firm seating.
- Loosening the rotor: Loosen the tension nut by turning in a counter clockwise direction, and turning until the working point for lifting. After passing the working point for lifting the rotor is loosened from the motor shaft cone. Turn the tension nut until the rotor is able to be lifted from the motor shaft.

11 Loading the rotor

Standard centrifuge containers of glass will not stand RCF values exceeding 4000 (DIN 58970, pg. 2).

- Check the rotor for firm seating.
- With swing-out rotors all rotor positions must be lined with **identical** hangers. Certain hangers are marked with the number of the rotor position. These hangers may only be used in the respective rotor position. Hangers that are marked with a set number (e.g. S001/4) may only be used in the set.
- The rotors and hangers may only be loaded symmetrically. The centrifuge containers have to be distributed evenly on all rotor positions.

12 Control and display elements

See figure on page 4.

Fig. 2: Display and control panel

12.1 Symbols on the control panel

Rotation indicator. The rotation indicator lights up and rotates anticlockwise while the rotor is turning.

When the rotor is stationary, the status of the lid is displayed by symbols in the rotation indicator:
Symbol ⌊ : Lid open
Symbol ▁ : Lid closed

Operator errors and occurring faults are indicated on the display (see Chapter "Faults").

12.2 Keys and setting options

RPM/RCF x 100 ▲ ▼

- Speed
  A numeric value of 500 RPM up to the maximum rotor speed can be set. Preset in steps of 100 (RPM = displayed value x 100).
  If the key ▲ or ▼ is kept pressed, the value changes with increasing speed.
- Display the brake step and the centrifuging radius.

t ▲ ▼

- Running time
  - Preset from 1 - 99 minutes, in 1 minute steps
  - Continuous operation "--"
- Centrifuging radius. Input in centimeters. Preset from 5 - 16 centimeters, in 1 centimeter steps.
- Braking steps 0 or 1. Step 1 = short run-down time, Step 0 = long run-down time.

If the key ▲ or ▼ is kept pressed, the value changes with increasing speed.

START

- Start centrifugation run.

STOP

- End centrifugation run.
  The rotor runs down with the preselected brake step.
- Save the brake step and the centrifuging radius.

RCF

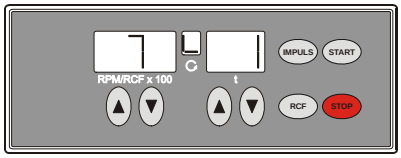
- Display of the relative centrifugal force (RCF).
  The display of the relative centrifugal force (RCF) appears while the key RCF is kept pressed.

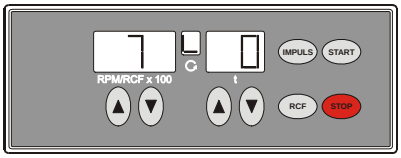
IMPULS

- Short-time centrifugation.
  The centrifugation run occurs while the key IMPULS is kept pressed.
- Display the brake step and the centrifuging radius.

13 Setting the brake step

- Switch off the mains switch.
- Keep the key ▲ beneath the speed indicator and the key IMPULS pressed simultaneously.
- Switch on the mains switch and release the keys again.
  The speed indicator shows the machine version and the time indicator shows the set brake step: e.g.:





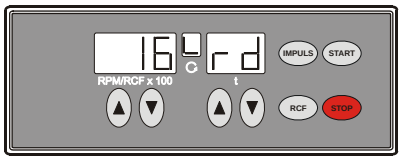
  If the machine version and brake step are not displayed, press the ▲ key under the speed indicator until they are displayed.
  The machine version is set by the manufacturer and cannot be changed.
- Set the desired brake step with the keys ▲ ▼ beneath the time indicator.
  Step 1 = short run-down time, Step 0 = long run-down time.

- Press the key STOP to save the setting.

14 Setting the centrifuging radius

The centrifuging radius must be entered in centimeters.

- Switch off the mains switch.
- Keep the key ▲ beneath the speed indicator and the key IMPULS pressed simultaneously.
- Switch on the mains switch and release the keys again.
- Press the key ▲ beneath the speed indicator until the following display appears:



  The set centrifuging radius is displayed in the speed indicator.
- Set the desired centrifuging radius with the keys ▲ ▼ beneath the time indicator.

- Press the key STOP to save the setting.

15 Centrifugation

When the centrifuge is running, according to EN / IEC 61010-2-020, no persons, dangerous substances or objects may be within the safety margin of 300 mm around the centrifuge.

If the permissible weight difference is exceeded within the rotor loading, the drive switches off during the run-up time, and error **-3-** is displayed (see chapter "Faults").

The centrifugation run can be interrupted at any time by pressing the key STOP.

The time and speed can be changed during the centrifugation run, with the keys ▲ ▼.

If the key ▲ or ▼ is kept pressed, the value changes with increasing speed.

After a centrifugation run, the display flashes until the cover is opened or a key is pressed.

If the symbol "⎽" (lid closed) and "⌞" (lid open) flashes alternately in the rotation indicator ↻, operation of the centrifuge can only be continued after opening the lid.

If **rot xx** is displayed, no centrifugation run has taken place because the rotor has been changed, see chapter "Rotor Identification".

- Switch on the mains switch (switch position "I").
- Load the rotor and close the centrifuge cover.

15.1 Centrifugation with preselected time

- Set the desired speed with the keys ▲ ▼ beneath the speed indicator.
- Set the desired time with the keys ▲ ▼ beneath the time indicator.
- Press the key START. The rotation indicator ↻ appears while the rotor is turning.

> The time is displayed in minutes. The last minute is counted down in seconds.
> When the time is displayed in minutes, a point flashes next to the number.

- After expiry of the time or if the centrifugation run is interrupted by pressing the key STOP, the rotor runs down with the set brake step.

During the centrifugation run, the rotor speed or the resulting RCF value and the remaining time are displayed.

15.2 Continuous operation

- Set the desired speed with the keys ▲ ▼ beneath the speed indicator.
- Set the time to zero with the key ▼ beneath the time indicator. "**--**" is displayed.
- Press the key START. The rotation indicator ↻ appears while the rotor is turning. The time count starts from 0.

> The first minute is counted up in seconds, and then the time is displayed in minutes.
> When the time is displayed in minutes, a point flashes next to the number.

- Press the key STOP to end the centrifugation run. The rotor runs down with the set brake step.

During the centrifugation run, the rotor speed or the resulting RCF value and the expired time are displayed.

15.3 Short-time centrifugation

- Set the desired speed with the keys ▲ ▼ beneath the speed indicator.
- Keep the key IMPULS pressed. The rotation indicator ↻ appears while the rotor is turning. The time count starts from 0.

> The first minute is counted up in seconds, and then the time is displayed in minutes.
> When the time is displayed in minutes, a point flashes next to the number.

- Release the key IMPULS again to end the centrifugation run. The rotor runs down with the set brake step.

During the centrifugation run, the rotor speed and the expired time are displayed.

15.4 Display of the relative centrifugal force (RCF)

The relative centrifugal force (RCF) can be displayed during the centrifugation run.

> If the relative centrifugal force (RCF) is used, the centrifuging radius must be entered.

- Keep the key RCF pressed during the centrifugation run.
  The relative centrifugal force (RCF) appears in the speed indicator (RCF = displayed value x 100).
- Release the key RCF again. The speed is displayed.

16 Acoustic signal

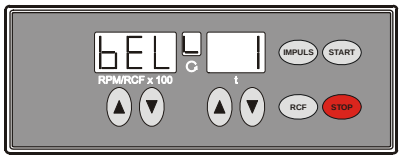
The acoustic signal sounds:

- After a disturbance occurs, in 2 second intervals.
- After completion of a centrifugation run and rotor standstill in 30 second intervals.

The acoustic signal is stopped by opening the lid or pressing any key.

The acoustical signal can be activated or deactivated as follows when the rotor is at a standstill:

- Switch off the mains switch.
- Keep the key ▲ beneath the speed indicator and the key IMPULS pressed simultaneously.
- Switch on the mains switch and release the keys again.
- Press the key ▲ beneath the speed indicator until the following display appears:



The acoustical signal setting is displayed on the time display.
0 = acoustical signal deactivated, 1 = acoustical signal activated.

- With the ▲ ▼ keys below the time display, set **0** or **1**.
- Press the key STOP to save the setting.

17 Relative centrifugal force (RCF)

The relative centrifugal force (RCF) is given as a multiple of the acceleration of gravity (g). It is a unit-free value and serves to compare the separation and sedimentation performance.
These values are calculated using the formula below:

$$RCF = \left(\frac{RPM}{1000}\right)^2 \times r \times 1{,}118 \qquad \Rightarrow \qquad RPM = \sqrt{\frac{RCF}{r \times 1{,}118}} \times 1000$$

RCF = relative centrifugal force
RPM = rotational speed (revolutions per minute)
r = centrifugal radius in mm = distance from the centre of the turning axis to the bottom of the centrifuge.

The relative centrifugal force (RCF) stands in relation to the revolutions per minute and the centrifugal radius.

18 Centrifugation of materials or mixtures of materials with a density higher than 1.2 kg/dm^3

When centrifuging with maxim revolutions per minute the density of the materials or the material mixtures may not exceed 1.2 kg/dm^3.
The speed must be reduced for materials or mixtures of materials with a higher density.

The permissible speed can be calculated using the following formula:

$$\text{Reduced speed } (n_{red}) = \sqrt{\frac{1.2}{\text{Greater density [kg/dm}^3\text{]}}} \times \text{maximum speed [RPM]}$$

e.g.: maximum speed RPM 4000, density 1.6 kg/dm^3

$$n_{red} = \sqrt{\frac{1.2\ \text{kg/dm}^3}{1.6\ \text{kg/dm}^3}} \times 4000\ \text{RPM} = 3464\ \text{RPM}$$

In the exceptional case that the maximum loading indicated on the hanger is exceeded, the speed must also be reduced.

The permissible speed can be calculated using the following formula:

$$\text{Reduced speed } (n_{red}) = \sqrt{\frac{\text{maximum load [g]}}{\text{actual load [g]}}} \times \text{maximum speed [RPM]}$$

e.g.: maximum speed RPM 4000, maximum load 300 g, actual load 350 g

$$n_{red} = \sqrt{\frac{300\ \text{g}}{350\ \text{g}}} \times 4000\ \text{RPM} = 3703\ \text{RPM}$$

If in doubt you should obtain clarification from the manufacturer.

19 Rotor recognition

Rotor recognition is carried out after each start of the centrifugation run.

If the rotor has been changed, the centrifugation run is canceled after rotor recognition. The rotor code (red xx) of the rotor is displayed.

- Press the key START. The last used centrifuge data will be displayed.

A further operation of the centrifuge is only possible after a single opening of the lid.

If the maximum speed of the rotor being used is less than the set speed, the speed is limited to the rotor's maximum speed.

20 Emergency release

The lid cannot be opened during power failure. An emergency release has to be executed by hand.

For emergency release disconnect the centrifuge from the mains.
Open the lid only during rotor standstill.
Only the plastic release pin provided may be used for emergency release.

See figure on page 2.

- Switch off the mains switch (switch position "0").
- Look through the window in the lid to be sure that the rotor has come to a standstill.
- Insert the release pin horizontally into the hole (fig. 1, A). Push the unlocking pin in until the handle can be lifted when the pin is pressed down.
- Open the lid.

21 Maintenance and servicing

The device can be contaminated.

Pull the mains plug before cleaning.

Before any other cleaning or decontamination process other than that recommended by the manufacturer is applied, the user has to check with the manufacturer that the planned process does not damage the device.

- Centrifuges, rotors and accessories must not be cleaned in rinsing machines.
- They may only be cleaned by hand and disinfected with liquids.
- The water temperature must be between 20 – 25°C.
- Only detergents/disinfectants may be used which:
  - have a pH between 5 - 8
  - do not contain caustic alkalis, peroxides, chlorine compounds, acids and alkaline solutions
- In order to prevent appearances of corrosion through cleaning agents or disinfectants, the application guide from the manufacturer of the cleaning agent or disinfectant are absolutely to be heeded.

21.1 Centrifuge (housing, lid and centrifuging chamber)

21.1.1 Surface cleaning and care

- Clean the centrifuge housing and the centrifuging chamber regularly, using soap or a mild detergent and a damp cloth if required. For one thing, this services purposes of hygiene, and it also prevents corrosion through adhering impurities.
- Ingredients of suitable detergents:
  soap, anionic tensides, non-ionic tensides.
- After using detergents, remove the detergent residue by wiping with a damp cloth.
- The surfaces must be dried immediately after cleaning.
- In the event of condensation water formation, dry the centrifugal chamber by wiping out with an absorbent cloth.
- Lightly rub the rubber seal of the centrifuge chamber with talcum powder or a rubber care product after each cleaning.
- The centrifuging chamber is to be checked for damage once a year.

If damage is found which is relevant to safety, the centrifuge may no longer be put into operation. In this case, notify Customer Service.

21.1.2 Surface disinfection

- If infectious materials penetrates into the centrifugal chamber this is to be disinfected immediately.
- Ingredients of suitable disinfectants:
  ethanol, n-propanol, ethyl hexanol, anionic tensides, corrosion inhibitors.
- After using disinfectants, remove the disinfectant residue by wiping with a damp cloth.
- The surfaces must be dried immediately after disinfecting.

21.1.3 Removal of radioactive contaminants

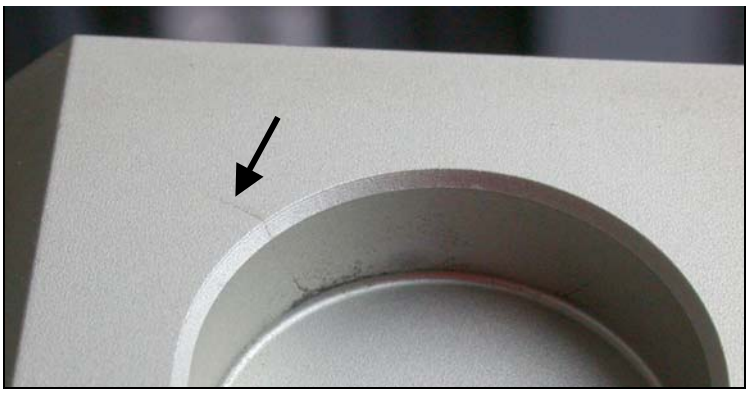
- The agent must be specifically labelled as being an agent for removing radioactive contaminants.
- Ingredients of suitable agents for removing radioactive contaminants:
  anionic tensides, non-ionic tensides, polyhydrated ethanol.
- After removing the radioactive contaminants, remove the agent residue by wiping with a damp cloth.
- The surfaces must be dried directly after removing the radioactive contaminants.

21.2 Rotors and Attachments

21.2.1 Cleaning and care

- In order to avoid corrosion and changes in materials, the rotors and accessories have to be cleaned regularly with soap or with a mild cleaning agent and a moist cloth. Cleaning is recommended at least once a week. Contaminants must be removed immediately.
- Ingredients of suitable detergents:
  soap, anionic tensides, non-ionic tensides.
- After using detergents, remove detergent residue by rinsing with water (only outside of the centrifuge) or wipe off with a damp cloth.
- The rotors and accessories must be dried directly after cleaning.
- Angle rotors, container and hanger made of aluminium are to be lightly greased after drying using acid-free grease, e.g. vaseline.
- In case of closed rotor, the packing rings must be checked and cleaned regularly (weekly).The sealing ring is to be replaced immediately upon indication of crack formation, embrittlement or abrasive wear. Lightly rub the packing rings with talcum powder or a rubber care product after each cleaning.

- In order to prevent corrosion as a result of moisture between the rotor and the motor shaft, the rotor should be disassembled and cleaned at least once a month, and the motor shaft should be lightly greased.
- The rotors and accessories have to be checked weekly for wear and corrosion. For swing-out rotors, it is important to check the area of the lifting lugs, for hangers, the grooves and the base should be checked for cracks.
  Example: Crack in the groove area:



Rotors and attachments may no longer be utilised upon indication of wear and tear or corrosion.

- Check the firm seating of the rotor on a weekly basis.

21.2.2 Disinfection

- If infectious material should get on the rotors or accessories, they must be appropriately disinfected.
- Ingredients of suitable disinfectants:
  ethanol, n-propanol, ethyl hexanol, anionic tensides, corrosion inhibitors.
- After using disinfectants, remove disinfectant residue by rinsing with water (only outside of the centrifuge) or wipe off with a damp cloth.
- The rotors and accessories must be dried directly after disinfection.

21.2.3 Removal of radioactive contaminants

- The agent must be specifically labelled as being an agent for the removal of radioactive contaminants.
- Ingredients of suitable agents for removing radioactive contaminants:
  anionic tensides, non-ionic tensides, polyhydrated ethanol.
- After removing the radioactive contaminants, remove agent residue by rinsing with water (only outside of the centrifuge) or wipe off with a damp cloth.
- The rotors and accessories must be dried directly after removing the radioactive contaminants.

21.2.4 Rotors and accessories with limited service lives

The use of certain rotors, hangers and accessory parts is limited by time.
These are marked with the maximum permitted number of operating cycles or with an expiration date and the maximum permitted number of operating cycles or just with the expiration date; e.g.:

- "einsetzbar bis Ende: IV. Quartal 2011 / usable until end of: IV. Quarter 2011" or
  "einsetzbar bis Ende Monat/Jahr: 10/2011 / usable until end of month/year: 10/2011"
- "Max. Lauf Zyklen / max. cycles: 40000".

For safety reasons, rotors, hangers and accessory parts may no longer be used if either the indicated maximum number of operating cycles or the indicated expiration date has been reached.

21.3 Autoclaving

The following accessory can be autoclaved at 121°C / 250°F (20 min):

- Swing-out rotors
- Angle rotors made of aluminum
- Hanger made of metal
- Lid with biocontainment
- Stands
- Reductions

Otherwise you must ask the manufacturer.
No statement can be made about the degree of sterility.

The lids of the rotors and containers must be removed prior to autoclaving.
Autoclaving accelerates the ageing process of plastics. In addition, autoclaving may discolour plastics.
We recommend that the packing rings of the closed rotor be replaced after autoclaving.

21.4 Centrifuge containers

- With leakiness or after the breakage of centrifuging containers broken container parts, glass splinters and leaked centrifugation material are to be completely removed.
- The rubber inserts as well as the plastic sleeves of the rotors are to be replaced after a glass breakage.

Remaining glass splinters cause further glass breakage!

- If this concerns infectious material, a disinfection process is to be executed immediately.

22 Faults

If the fault cannot be eliminated with the help of the fault table, please inform Customer Service.

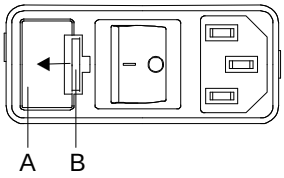
Please specify the type of centrifuge and the serial number. Both numbers can be found on the name plate of the centrifuge.

Perform a MAINS RESET:
- Switch off the mains switch (switch position "0").
- Wait at least 10 seconds and then switch on the mains switch again (switch position "I").

Fault	Display	Cause of fault	Remedy
No display	---	No voltage Mains input fuses defective.	- Check distribution voltage. - Check mains power input fuse, refer to Chapter "Change mains input fuse". - Mains switch ON.
Tacho error	- 1 -	Failure of speed impulses during operation.	- The device may not be switched off as long as the rotation display is lit up and rotating. Wait until the "▬" icon (lid closed) appears in the rotation display (after about 100 seconds) and then run a "POWER RESET".
System reset	- 2 -	Power failure during the centrifugation run. (The centrifugation run was not finished.)	- When stationary, open lid and press START key. - Repeat the centrifugation run if necessary.
Balance error	- 3 -	The rotor is unevenly loaded.	- Open lid when rotor is stationary. - Check the loading of the rotor, see chapter "Loading the rotor". - Repeat the centrifugation run.
Communication	- 4 -	Fault in control unit or power unit.	- Perform a MAINS RESET when the rotor has been stationary.
Overload	- 5 -	Motor or motor control defective.	- Perform a MAINS RESET when the rotor has been stationary.
Overvoltage Undervoltage	- 6 - - 8 -	Supply voltage outside tolerance (see Technical Data).	- Perform a MAINS RESET when the rotor has been stationary. - Check supply voltage.
Overspeed	- 7 -	Fault in the power unit.	- Perform a MAINS RESET when the rotor has been stationary
Excess temperature	- 9 -	Excess temperature switch in motor has triggered.	- When rotor is stationary, open lid using emergency unlocking (see Emergency Unlocking chapter). - Allow motor to cool down.
Version error	A number is displayed in the time indicator.	Incorrect machine version set, control unit jumps into Setting menu.	- Set the number 4 using the ▲ ▼ keys underneath the time indicator. - Press the key STOP to save the setting. - Perform a MAINS RESET.
Controller watchdog	- C -	Fault in control unit.	- Perform a MAINS RESET when the rotor has been stationary.
Lid error	- d -	Error in lid locking or lid closure.	- Perform a MAINS RESET when the rotor has been stationary.
Short circuit	- E -	Short circuit in control unit / power unit.	- Perform a MAINS RESET when the rotor has been stationary.
No rotor code	- F -	No rotor recognition at start. No rotor fitted or defective tacho.	- Perform a MAINS RESET when the rotor has been stationary.
New rotor identified	rot...	see section rotor identification.	- Press the key START.

23 Change mains input fuses

Switch off the mains switch and separate the device from the mains!



The fuse holder (A) with the mains input fuses is located next to the mains switch.

- Remove the connecting cable from the machine plug socket.
- Press the snap-fit (B) against the fuse holder (A) and remove.
- Exchange defective mains input fuses.

  Only use fuses with the rating defined for the type. See the following table.

- Reinsert the fuse holder until the snap-fit clicks shut.
- Reconnect the device to the mains supply.

Model	Type	Fuse	Order no.
Cellspin® I	1206-18	T 3,15 AH/250V	JC997
Cellspin® I	1206-19	T 5 AH/250V	JC914

24 Returning Devices

Before returning the device, a transport securing device has to be installed.

If the device or its accessories are returned to THARMAC® GmbH, in order to provide protection for people, the environment and materials, it has to be decontaminated and cleaned before being shipped.
We reserve the right to refuse contaminated devices or accessories.
Costs incurred for cleaning and disinfection are to be charged to the customer.
We ask for your understanding in this matter.

25 Disposal

Before disposal, the device must be decontaminated and cleaned to protect people, the environment and property.
When you are disposing of the device, the respective statutory rules must be observed.
Pursuant to guideline 2002/96/EC (WEEE), all devices supplied after August 13, 2005 may not be disposed as part of domestic waste. The device belongs to group 8 (medical devices) and is categorized in the business-to-business field.

The icon of the crossed-out trash can shows that the device may not be disposed as part of domestic waste.
The waste disposal guidelines of the individual EC countries might vary. If necessary, contact your supplier.

Working with *Cellspin®* Cytocentrifuge

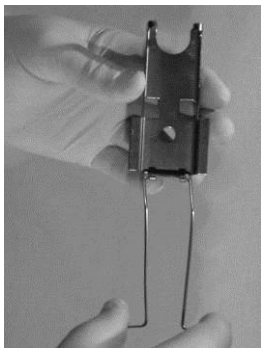
26. Introduction

Cellspin® Cytocentrifuge was developed to concentrate particles like cells or similar which are in suspension on the Cytoslide.

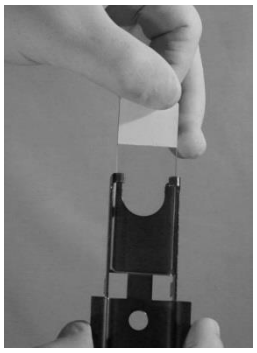
The device contains a **CellClip-rotor** with a maximal speed of 2,000 rpm.

Depending on version, the **CellClip-rotor** is able to carry up to 12 **preparation systems**.

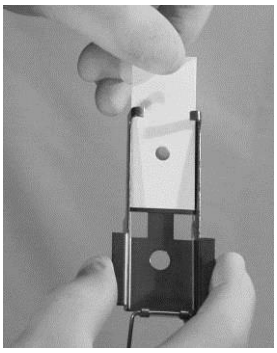
One **preparation system** includes:



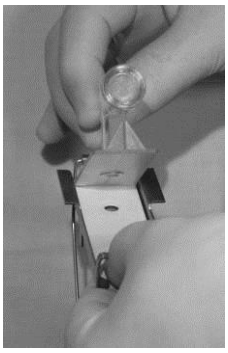
CellClip



Cytoslide or Square- / ECO-slide



Filter card or Square-/ ECO-seal



Cellfunnel® disposable or reusable

For an optimal result always use original high-quality **THARMAC® GmbH** consumables:

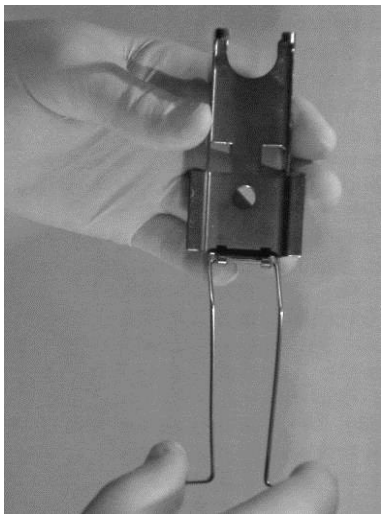
For the Cellfunnel®-preparation system:
- **CellClips**
- **Filter card**
- **Cellfunnel®**

For the Square Cellfunnel®-preparation system:
- **CellClips**
- **Square- / ECO-seal**
- **Square / ECOfunnel®**

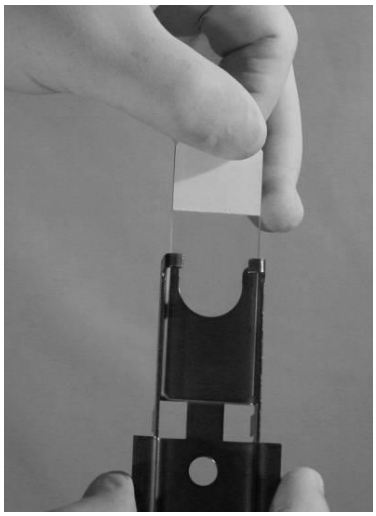
For accelerated diagnostics use our special **Cytoslides** or **Square-/ ECO-slides** with sedimentation area, which allows a simplified finding of cells.

27. Assembling and disassembling of Cellfunnel® preparation system

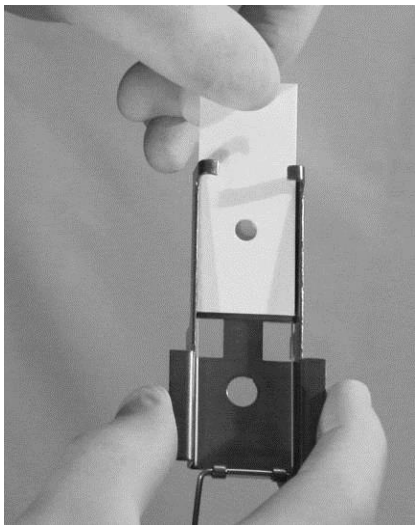
! For your own safety always wear suitable protective clothing !



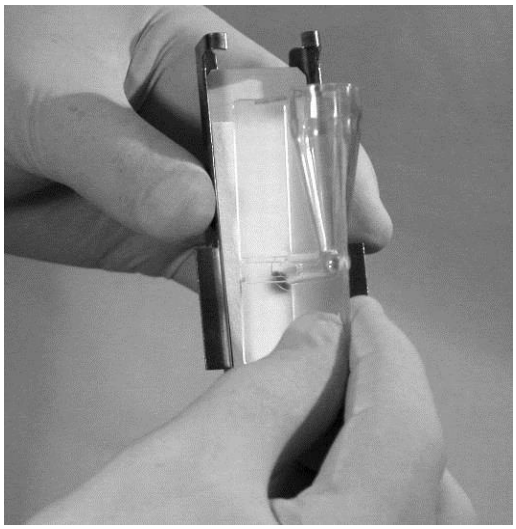
1. Open the clamp of the **CellClip.**



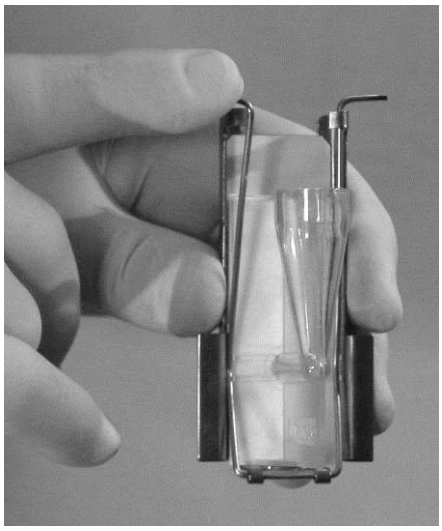
2. Insert the **Cytoslide** with marked side upwards.



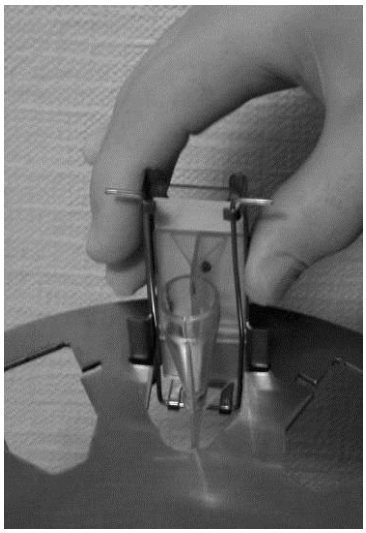
3. Insert **Filter card** (not applicable by using Cellfunnel® disposable).



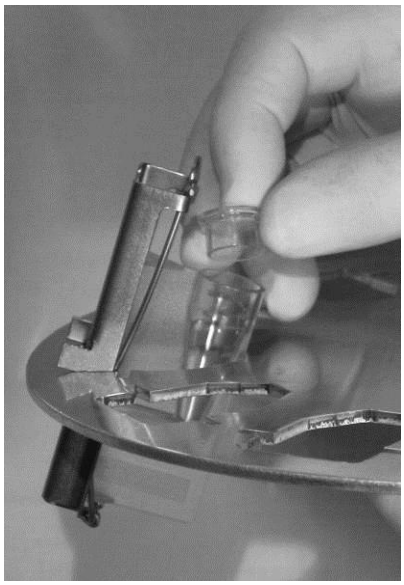
4. Insert **Cellfunnel®** (disposable or reusable).



5. Move clamp about **Cellfunnel®** and clip in both hooks.

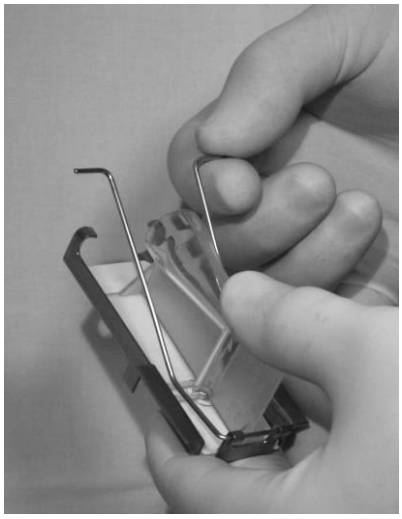


6. Insert the **preparation system** in the **CellClip-rotor** of your *Cellspin®* Cytocentrifuge.

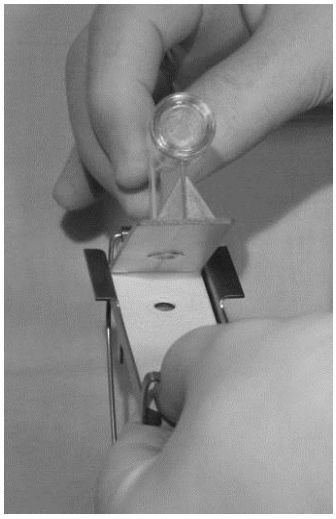


7. Pipette up to 0.5 ml cell suspension into the funnel of the **Cellfunnel®.** Put on the cap, close the cyto-centrifuge cover, set time and rotation speed and press start button.

After centrifugation remove the **preparation system** and disassemble it as follows:

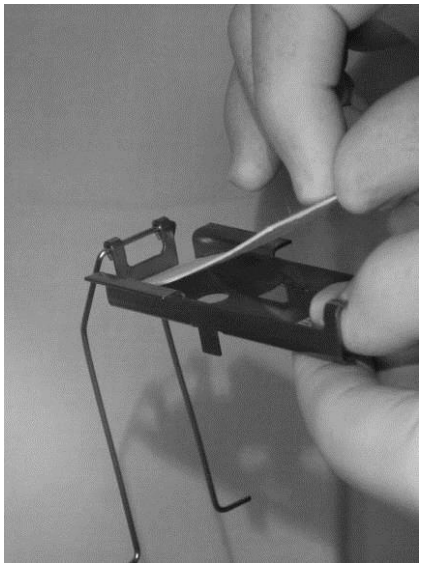


8. Hold the **preparation system** in one hand and press lightly on the **Cellfunnel®** when opening the **CellClip.**

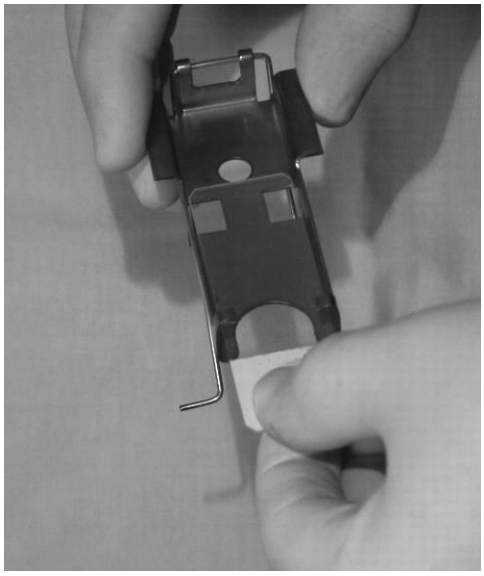


9. Remove the **Cellfunnel®** and put it into disinfectant solution.

While disassembling the **preparation system** do not move or shift the filter card on the Cytoslide!



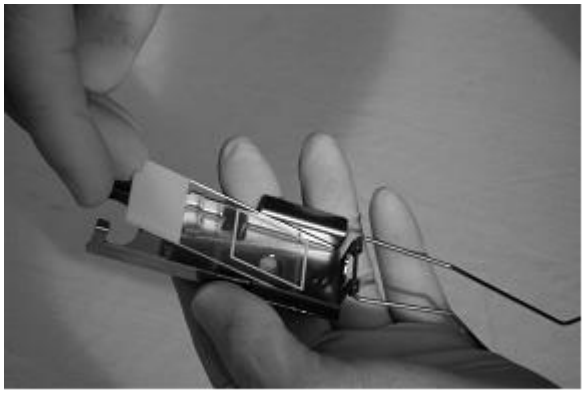
10. Press thumb on the **Cytoslide** and remove the **filter card**.
Dispose the used filter card according to general regulations.



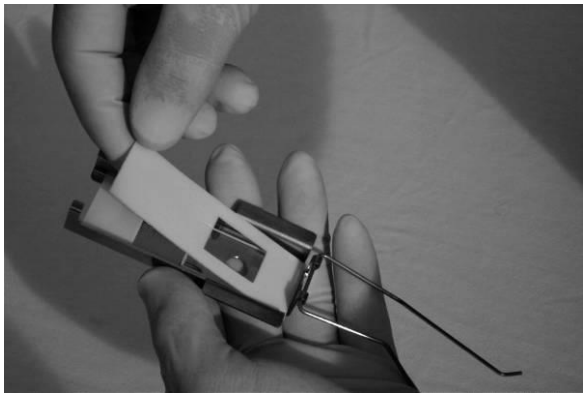
11. Remove the **Cytoslide.**
Put the **Cellclip** and the reusable **Cellfunnel®** into disinfectant solution.
Dispose disposable **Cellfunnel®** according to general regulations.

28. Assembling and disassembling of the Square / ECOfunnel® preparation system

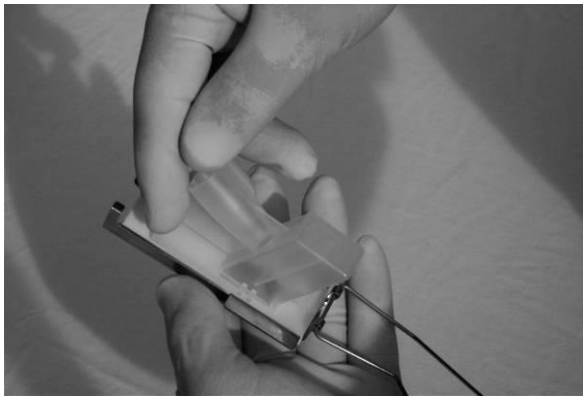
! For your own safety always wear suitable protective clothing !



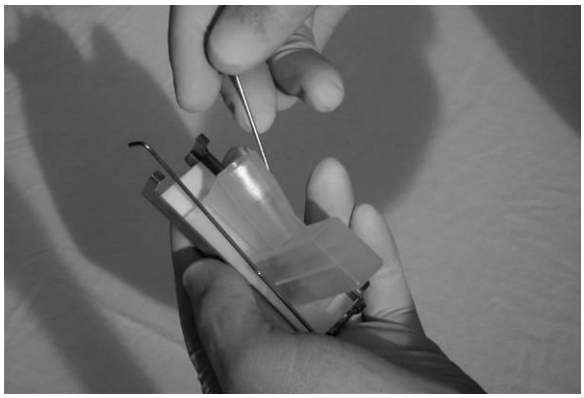
1. Insert the **Square-/ ECO-slide** with marked side upwards into the **CellClip**.



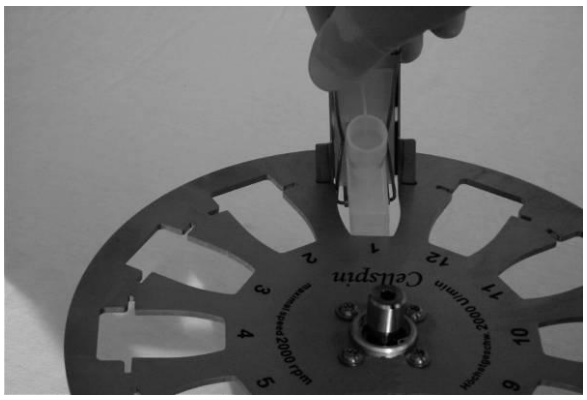
2. Apply the **Square- / ECO-seal**.
(Take care of correct positioning).



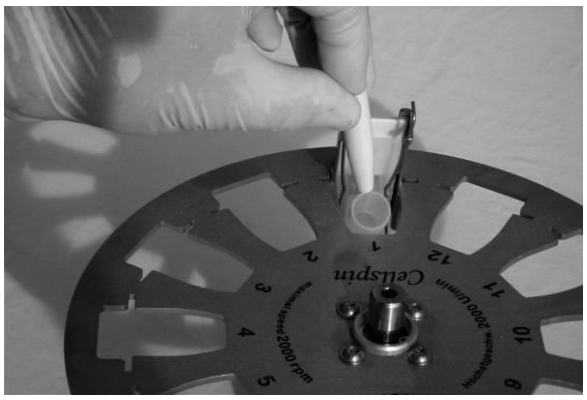
3. Insert the **Square / ECOfunnel®**.



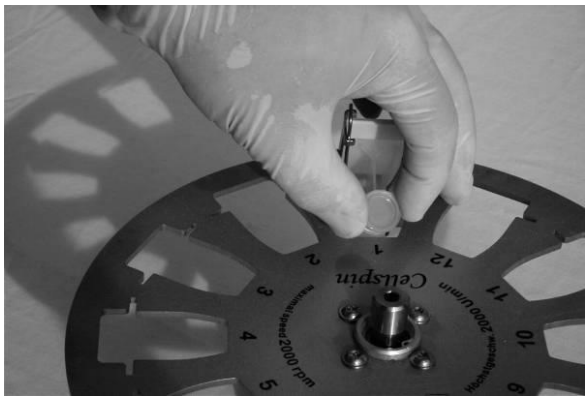
4. Close the **CellClip.**



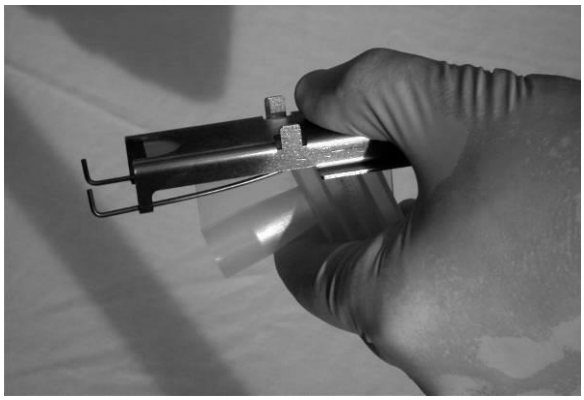
5. Insert the **preparation system** in the **CellClip-rotor** of the *Cellspin®* Cytocentrifuge.



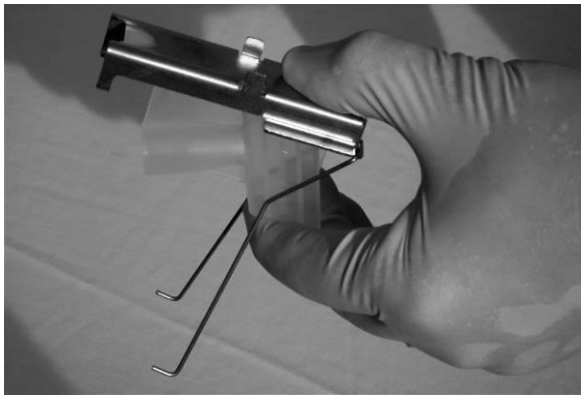
6. Shake vial with cell suspension and determine the turbidity. Depending on turbidity pipette 1-2 ml cell suspension into the **Square / ECOfunnel®**.



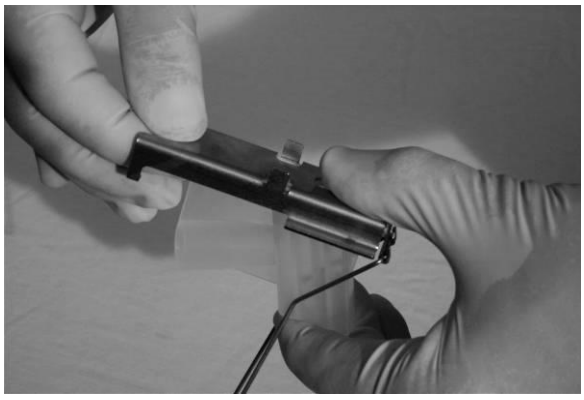
7. Close **Square / ECOfunnel®** with a cap. Centrifuge the samples.



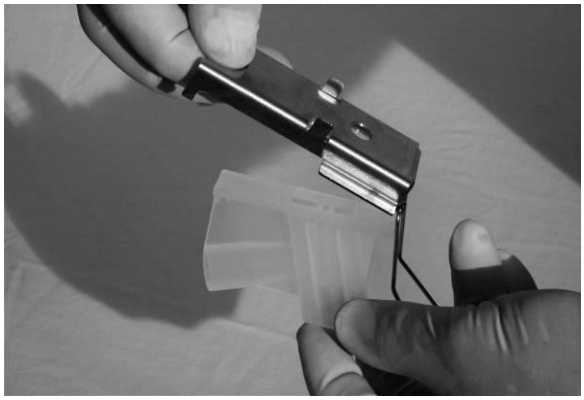
8. After centrifugation remove **preparation system** from the rotor tilted to prevent running back of the cell suspension onto the **Square-/ ECO-slide**. Decant excess liquid.



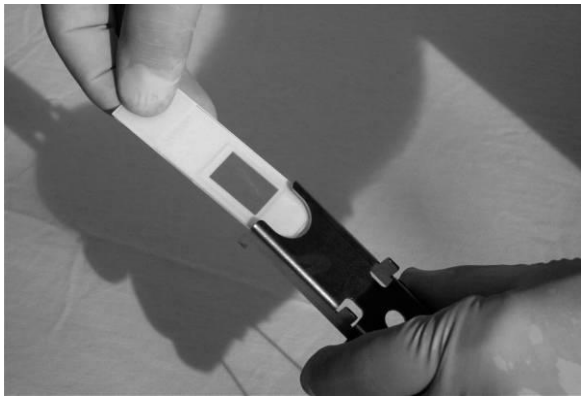
9. Press the **Square / ECOfunnel®** lightly on the **CellClip**, open the clamp slowly.



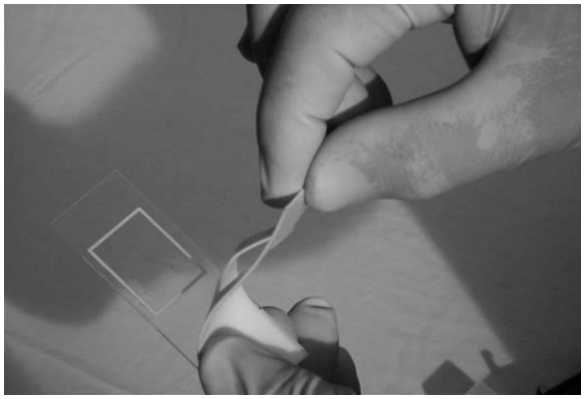
10. Hold **Square- / ECO-slide** and **Square- / ECO-seal.**



11. Put reusable **Square / ECOfunnel®** into disinfectant solution.
Dispose disposable **Square / ECOfunnel®** according to general regulations.



12. Remove **Square- / ECO-slide** and **Square- / ECO-seal** together.



13. Remove **Square- / ECO-seal** carefully from **Square- / ECO-slide.**
Dispose the seal according to general regulations.

Stain **Square- / ECO-slide** according to
established staining protocol.

29. Cleaning reusable Cellfunnel® or Square / ECOfunnel® and CellClips

Disinfection

After application, disinfect **reusable Cellfunnel®** or **Square / ECOfunnel®** and **CellClips**. We recommend in laboratories usually used surface disinfectant.

After disinfection wash **Cellfunnel®** or **Square / ECOfunnel®** and **CellClips** in water and dry them.
Do not use bottlebrushes or harsh detergents.

Cellfunnel® or **Square / ECOfunnel®** are designed for multiple use. Due to disinfectant over a longer time the inside of the **Cellfunnel®** can be roughen. Thus, we recommend renewing the Cellfunnel® after a period of three years.

Cleaning/disinfection of closed CellClip-rotor and seal

Sterilization: autoclave at 121 °C (250 °F) for 15 min.
Cleaning: wipe out with a 2% glutaraldehyde-solution according to manufacturer guidelines.

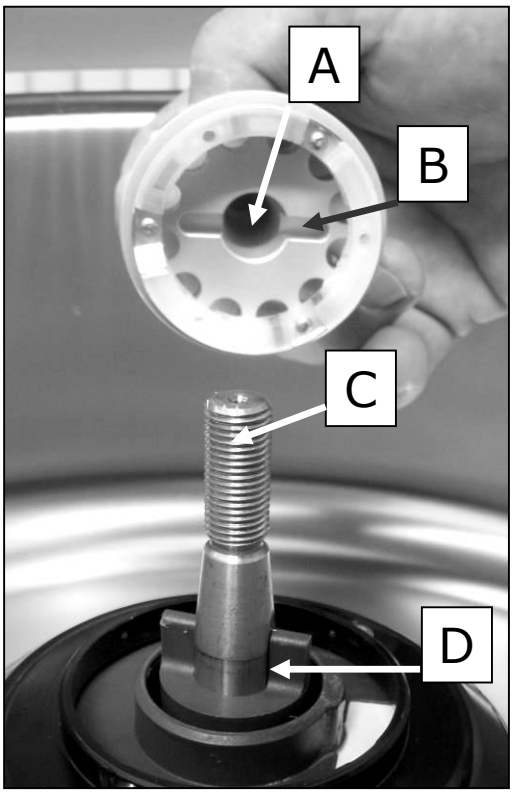
After cleaning, rub the seal of closed rotor with talcum powder or a rubber care product.

Disposing of filter cards

The filter cards are generally determined for one-time use.
Due to possibly contamination, filter-cards have to be disposed safely after use.

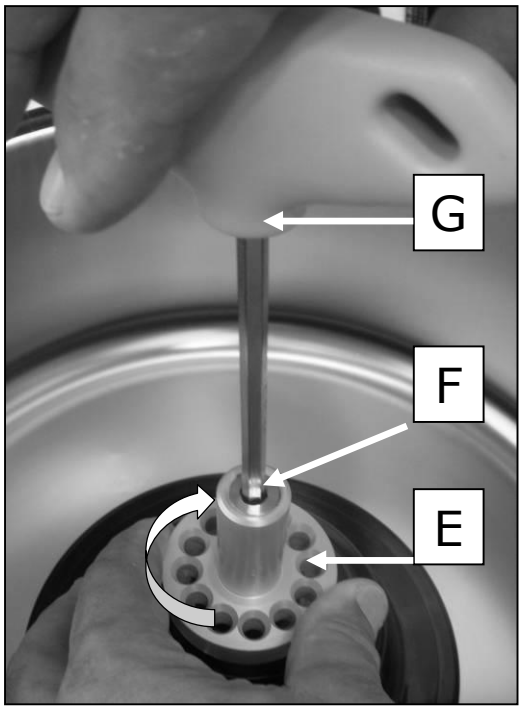
Advices for cleaning your *Cellspin®* Cytocentrifuge please read the instructions of the centrifuge

30. Installation and removal of rotor hub (E)



1. Clean motor shaft **(C)** and the hole of the hub **(A)**. Then grease slightly the motor shaft. Dirt located between motor shaft and rotor prevent a perfect fit of the hub and causes a turbulent run.

2. Put on the hub vertically. The carrier of the motor shaft **(D)** must be located in the groove of the hub **(B)**.



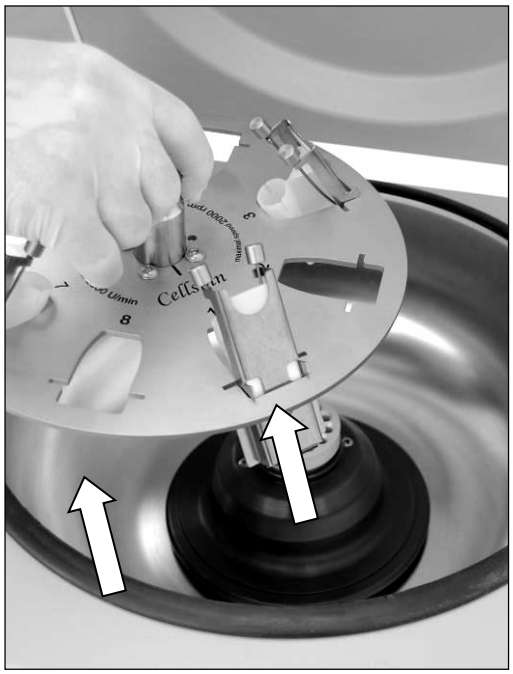
3. Tighten the clamping nut **(F)** of the hub **(E)** with the supplied key **(G)** by turning clockwise.

4. Check if rotor fits firmly.

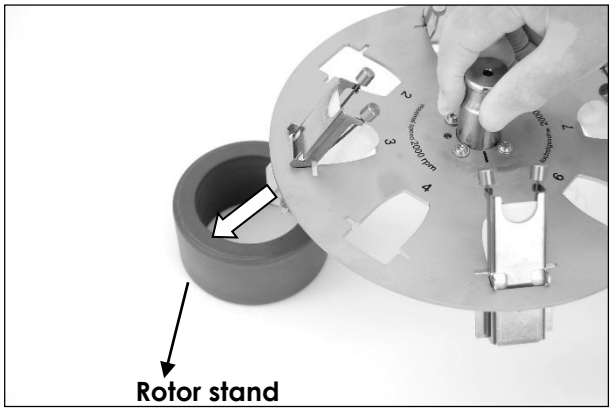
Removing the hub: Remove the clamping nut by turning counterclockwise and turn the hub to the take-off pivot. After overcoming the take-off pivot, the hub removes from cone of the motor shaft. Turn the clamping nut until you can take off the hub from motor shaft.

30.1 Removable rotor 370

1. Take the rotor out of the centrifuge *(Fig. 6.1)* and park it on the supplied rotor stand *(Fig. 6.2)* to load or clean the rotor beyond the *Cellspin®*.

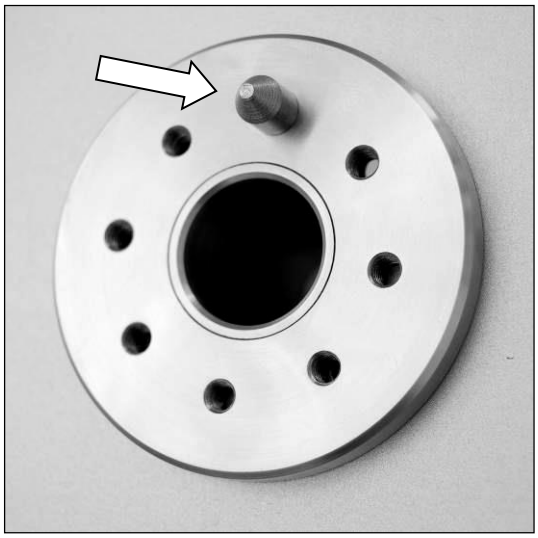


(figure. 6.1)



(figure. 6.2)

2. Take care that for the reset of the rotor, the guide pin at the bottom of the rotor *(Fig. 6.3)* has to lock in one of the holes of the hub *(Fig. 6.4)*.



(figure. 6.3)

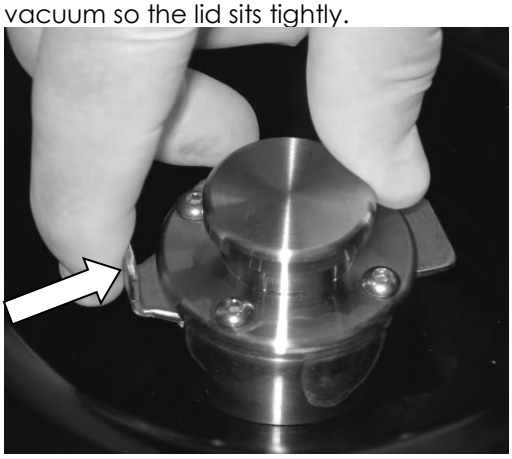
(figure. 6.4)

Attention: Please grease the axis.

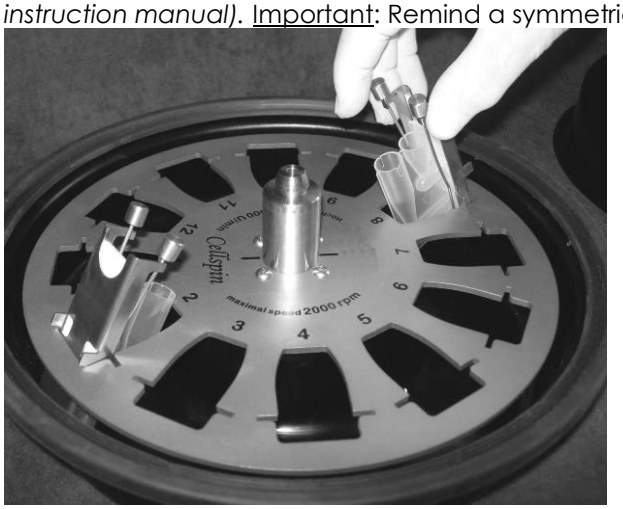
31. Closed CellClip-rotor 101

1. Take the CellClip-rotor out of the *Cellspin®*.

2. Press with the index finger on the closure (s.b.) and take off the lid. Due to dense lock, there is a light vacuum so the lid sits tightly.

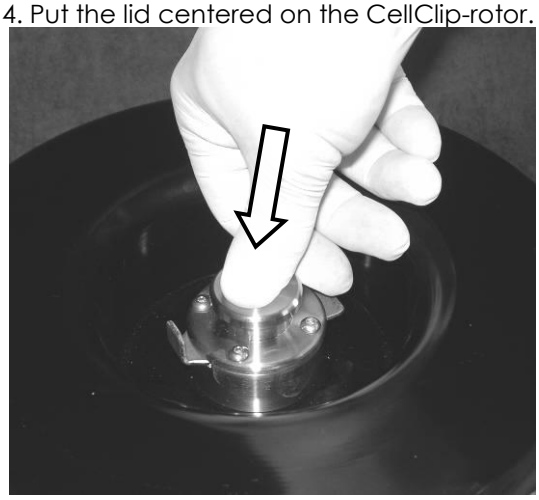


3. Insert the **Cellfunnel®-** or **Square / ECOfunnel®-preparation system** *(for assembling see point 2 and 3 in the instruction manual)*. Important: Remind a symmetrical load of the CellClip-rotor.



Attention: Please grease the axis lightly.

4. Put the lid centered on the CellClip-rotor. Press centrically on the closure until it locks. (Click-noise)



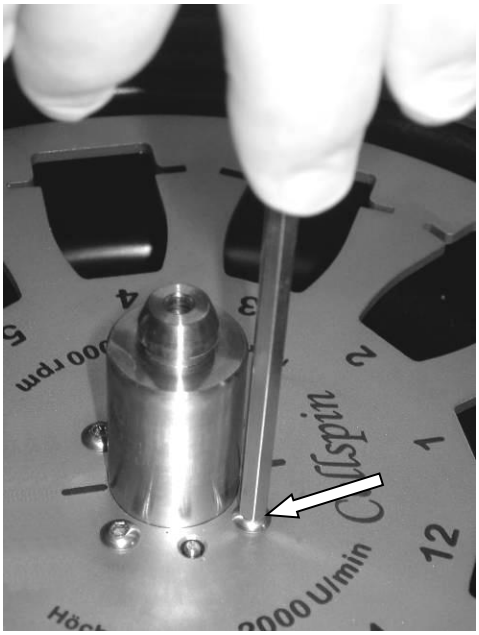
5. Take CellClip-rotor into the *Cellspin®* and place it on the hub.

31.1 Cleaning the closed CellClip-rotor

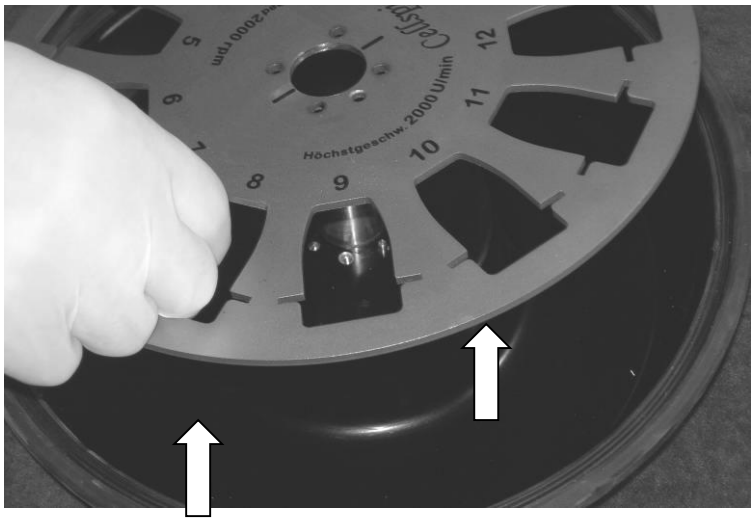
Information: Do not clean the closed CellClip-rotor in the dishwasher or with harsh detergents !!!

1. Open the closed CellClip-rotor.

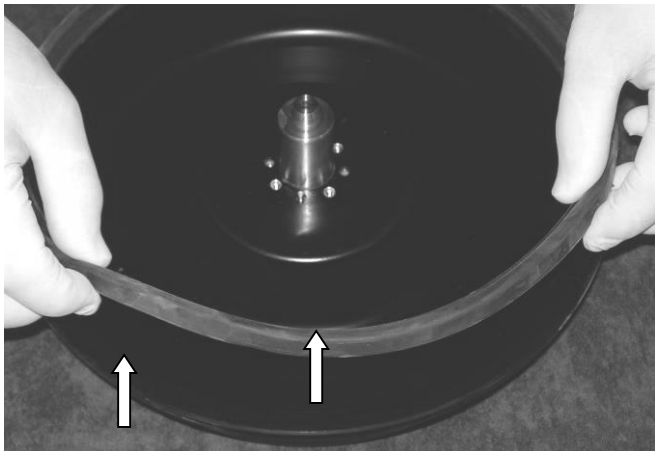
2. Remove the four screws. (see figure)



3. Take application out of the CellClip-rotor.

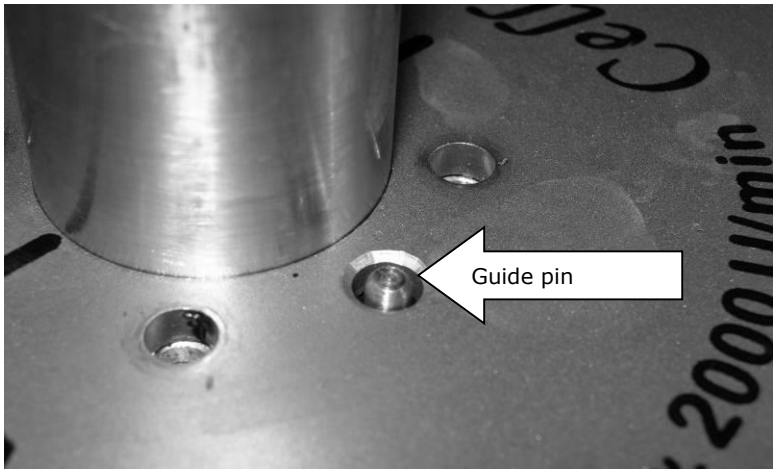


4. Remove seal from outer rotor.



5. Clean or disinfect application, rotor, lid and seal.

6. Insert the application centered into the rotor.
Take care that guide pin is inside the provided port (see figure).



7. Screw the four screws tightly.
Attention: Please grease the axis lightly.

8. Put the seal on the outer rotor. Please check if seal mounts evenly.
Dust the seal lightly with talcum.

32. Application field for *Cellspin®* Cytocentrifuge

All cell suspensions can be processed within the *Cellspin®* Cytocentrifuge.

Body fluids

e.g. out of chest and belly area, testicles, outpourings in joints, urine, cysts, liquids out of the ureter, bladder or renal pelvis, cerebrospinal fluid.

Suspensions made of brushed, wiped off or sucked off cells

e.g. smear of cervix and bronchial flushing

Suspensions out of cell cultures

e.g. in the virology
Cell cultures in liquid media

Gynecological cytology:

Cysts liquids out of mamma und ovary
Douglas puncture
Ascites
Urine

Urology:

Urine and liquids out of flushing
Cysts out of the kidneys
Outpourings out of the testicles possibly ascites

Cytology of internal medicine:

Ascites
Pleura-Pericardial effusion
Liquids out of stomach flushing
Bronchial secretion
Cysts

Neurology:

Cerebrospinal fluid

Pathology:

Processing of all sent in cell suspensions and liquids.

33. Instruction for processing of different body fluids with *Cellspin®* Cytocentrifuge

Please consider:
The following protocols are just case examples! You have to develop instructions for sampling, preparation and staining, respectively, adapted to your laboratory. All instructions need to be adapted to the processing question.

Examination material:	Oral mucosa
Extraction:	Brush
Fixation:	The brush is put into a plastic vial filled with fixation fluid and equipped with a screw cap Alternative: Fixation-spray for smear test
Transport:	By mail
Pretreatment:	**Centrifugation at 2,100 rpm for 10 Min**. **Decantation of supernatant and shaking up of the sediment** If the sample is bloody an additional pretreatment is required.
Cyto centrifugation:	The Square-slide is inserted into the CellClip with filter card and Square Cellfunnel®. **Pipette 2.5 ml of the sampling into the Square / ECOfunnel® and centrifuge at 1,800 rpm for 5 minutes.**

Put CellClip with Square- / ECO-slide, filter card and Square / ECOfunnel® into CellClip-rotor before pipetting!

Recommendation:	The material should be processed completely.
Fixation:	Fixation-spray
Staining:	Papanicolaou-staining

Air-dried preparations can be stored for special analyses, like e.g. immunocytochemistry.

Examination material:	Liquor
Extraction:	Puncture
Fixation:	None, if it is processed in the laboratory within 1-2 hours or in fixation with alcohol in relation 1:1
Transport:	From operating room to the laboratory - fresh material in plastic vessels with screw cap by courier or by mail – fixed material
Pretreatment:	None
Cyto centrifugation:	The Cytoslide is inserted into the CellClip with filter card and Cellfunnel® or Double Cellfunnel®.

In case of potentially infectious material, you should use the disposable Cellfunnel®.

A	Pipette 0.5 ml sample fluid into the opening (optionally 2 x 0.5 ml when using Double Cellfunnel®)

Put CellClip with Cytoslide, filter card and Cellfunnel® into CellClip-rotor before pipetting!

B	**cytocentrifugation is performed at 1,000 rpm for 10 minutes.**
Recommendation:	The material should be processed completely.
Fixation:	depends on staining e.g. Pap-staining: Fixation-spray May-Grünwald: air-drying
Staining:	mainly May-Grünwald staining

Air-dried preparations can be stored for special analyses, like e.g. immunocytochemistry.

Examination material:	Bronchial lavage
Extraction:	Bronchial lavage under bronchoscopy
Fixation:	Saccomano-Fixativ or 96% alcohol 1:1
Transport:	directly from operating room, by courier or mail
Pretreatment:	**Centrifugation at 1,500 rpm for 10 minutes.**
	Decantation of supernatant and shaking up of the sediment
Cyto centrifugation:	The Cytoslide is inserted into the CellClip with filter card and Cellfunnel® (optionally Double Cellfunnel® or Square / ECOfunnel®)

In case of potentially infectious material, you should use the disposable Cellfunnel®.

A	Pipette 0.5 ml sample fluid into the opening (optionally 2 x 0.5 ml by using Double Cellfunnel® or 1 ml when using Square / ECOfunnel®)

Put CellClip with Cytoslide/ Square-/ ECO-slide, filter card/Square- / ECO-seal and Cellfunnel®/ Square / ECOfunnel® into CellClip-rotor before pipetting!

B	**cytocentrifugation at 2,000 rpm for 10 minutes.**
Recommendation:	The material should be processed completely.
Fixation:	depends on staining
	e.g. Pap-staining: Fixation-spray May-Grünwald: air-drying
Staining:	Papanicolaou-staining or May-Grünwald-staining

Air-dried preparations can be stored for special analyses, like e.g. immunocytochemistry.

Examination material:	Cyst aspirates
Extraction:	Puncture
Fixation:	Mixture of alcohol
Transport:	Plastic vial with screw cap possibly prefilled with fixation fluid in relation 1:1
Pretreatment:	**Centrifugation at 2,000 rpm for 10 minutes** **Decantation of supernatant and shaking up of the sediment**
Cyto centrifugation:	The Cytoslide is inserted into the CellClip with filter card and Cellfunnel® (optionally Double Cellfunnel® or Square / ECOfunnel®)

In case of potentially infectious material, you should use the disposable Cellfunnel®.

A	Pipette 0.5 ml sample fluid into the opening (optionally 2 x 0.5 ml by using Double Cellfunnel® or 1 ml when using Square Cellfunnel®)

Put CellClip with Cytoslide/Square-slide, filter card/Square-seal and Cellfunnel®/Square / ECOfunnel® into CellClip-rotor before pipetting!

B	**cytocentrifugation at 1,500 rpm for 10 minutes.**
Recommendation:	The material should be processed completely.
Fixation:	depends on staining e.g. Pap-staining: Fixation-spray May-Grünwald: air-drying
Staining:	Papanicolaou-staining or May-Grünwald-staining

Air-dried preparations can be stored for special analyses, like e.g. immunocytochemistry.

Examination material:	Urine
Extraction:	Midstream urine, catheter urine, vesicoclysis
Fixation:	Mixture of alcohol (Recommendation: Cellcollect)
Transport:	Plastic vial with screw cap possibly prefilled with fixation fluid in relation 1:1
Pretreatment:	**Centrifugation at 2,000 rpm for 10 minutes**
	Decantation of supernatant and shaking up of the sediment
Cyto Centrifugation:	The Cytoslide is inserted into the CellClip with filter card and Cellfunnel®.

In case of potentially infectious material, you should use the disposable Cellfunnel®.

A	Pipette 0.5 ml sample fluid into the opening

Put CellClip with Cytoslide/Square- / ECO-slide, filter card/Square- / ECO-seal and Cellfunnel®/ Square / ECOfunnel® into CellClip-rotor before pipetting!

B	**cytocentrifugation at 1,500 rpm for 10 minutes.**
Recommendation:	The material should be processed completely.
Fixation:	depends on staining
	e.g. Pap-staining: Fixation-spray May-Grünwald: air-drying
Staining:	Papanicolaou-staining or May-Grünwald-staining

Air-dried preparations can be stored for special analyses, like e.g. immunocytochemistry.

Examination material:	Pleura/ Ascites
Extraction:	Puncture
Fixation:	Unfixed
Transport:	directly from operating room, by courier or mail in plastic vials with screw cap, material should be processed within 24 h.
Pretreatment:	**Centrifugation at 2,000 rpm for 10 minutes** **Decantation of supernatant and shaking up of the sediment**
Cyto centrifugation:	The Cytoslide is inserted into the CellClip with filter card and Cellfunnel® (optionally Double Cellfunnel® or Square / ECOfunnel®).

In case of potentially infectious material, you should use the disposable Cellfunnel®.

A	Pipette 0.5 ml sample fluid into the opening (optionally 2 x 0.5 ml by using Double Cellfunnel® or 1 ml when using Square Cellfunnel®)

Put CellClip with Cytoslide/Square- / ECO-slide, filter card/Square- / ECO-seal and Cellfunnel®/ Square / ECOfunnel® into CellClip-rotor before pipetting!

B	**cytocentrifugation at 2,000 rpm for 10 minutes.**
Recommendation:	The material should be processed completely.
Fixation:	depends on staining e.g. Pap-staining: Fixation-spray May-Grünwald: air-drying
Staining:	Mainly May-Grünwald-staining

Air-dried preparations can be stored for special analyses, like e.g. immunocytochemistry.

34. Additional information

Some information about the operation of the device to facilitate the entry into the application:

Quantity of sample liquid

Cellfunnel® are aligned to obtain an optimal result with 0.1 – 0.5 ml of sample liquid.
Double Cellfunnel® can be filled with 2 x 0.1 – 0.5 ml.
Square / ECOfunnel® can be filled up to 4 ml.

If there is more liquid available, the quantity of sample liquid should be split into two or more sample chamber.

Which concentration of cells?

The number of cells should be selected as follows (possibly with cell counter):

Single Cellfunnel®	= 1x	approx. 100,000 cells
Double Cellfunnel®	= 2x	approx. 100,000 cells
Square / ECOfunnel®	= 1x	approx. 1.000,000 cells

Liquids with a larger number of cells should be diluted to reach the desired quantity of cells.

Centrifugation speed, times and acceleration

Surveys with users showed, that generally a speed of 500 rpm up to 1,500 rpm for 10 minutes is sufficient for most of the samples. Liquids with a high protein concentration need more time.

Crucial for the time is the complete absorption of liquid to the filter card and the whereabouts of the cells on the Cytoslides. Too short times induce whereabouts of liquid in the sample chamber and a possible float of the cells. Too long times after completely absorption of liquids induce a drying out of the cells preparations, which results in a degradation of the cells.

35. Prevention of inaccurate results

Question: **I do not receive any cells**

Answer: The exit opening of the filter card is blocked. Ensure that the opening of the filter card is located at the bottom of the CellClip towards the opening in the Cellfunnel®.

Question: **There are no abnormal cells in my preparation, although I have abnormal cells in the sample**

Answer: Probably the abnormal cells are bigger and heavier than the normal cells. Thus, they set off at the bottom of the concentrate. There they can be easily missed if the cell pellet is not completely resuspended after precentrifugation. Resuspending the cells can be done in a vortexmixer in a centrifugation tube and several ml of electrolyte solution.

Question: **I do not receive enough cells**

There can be different reasons for it:

- In the diluted preparation are not enough cells.
- Rarely populated preparations fill cylindrical und conical parts of the Cellfunnel®.
- Too few cells were given into the Cellfunnel®.
- The cells emanate due to hyaluronic acid in jointly fluid.
- The Cytoslide is located between exit opening of the Cellfunnel and filter card.

Answer: You can solve the problems as follows:
Suspend again the cells in 1-2 ml electrolyte solution and if possible combine the content of several centrifugation tubes from the same preparation. Examine one drop of the resuspended cell concentrate.
Enrich the preparation as mentioned above .

Release the hyaluronic acid precipitation in some hyaluronidase.

Assemble the preparation system in correct order.

Question: **I receive too many cells**

Answer: The Cellfunnel® was filled with too much suspension of highly concentrated cell suspensions. Examine one drop of the resuspended cell concentrate; if necessary dilute up to the tenfold.

Refer the dimension of the sample to the quantity of cells.

Information: Do not count on the appearance of the preparations.

Question: **The cells flow toward the label or toward the opposite direction**

Answer: The thin adherent cells were too wet before fixation so they were pressed up to the label when putting the Cytoslide into alcohol or they were slipped when removing from alcohol. Let suspension medium almost completely evaporate before fixation.

Question: **I receive a roundly cell band or „bulls eye formed" allocation**

Answer: The cells are adherent thick and the borders are almost dry while the center furthermore is wet. This supports the washing-up of the cells. Add less cell suspension.

Before cytocentrifugation use suspension with unfixed and fresh cells. Even do not use cell suspensions or blood cell suspension that were not collected in alcohol.

Soap blood cell suspensions before cytocentrifugation.

Check the number of cells.

Compensate the difference in cell suspensions and do not use suspensions, which were not processed in the *Cellspin®* Cytocentrifuge. Use always clean slides (none out of frosted or albumin glass).

Use a balanced electrolyte solution.

Keep the cell suspension away from the filter card.

Do not use a normal saline.

36. Recommended times and speed

Please consider:
The following protocols are just case examples! You have to develop instructions for sampling, preparation and staining, respectively, adapted to your laboratory. All instructions need to be adapted to the processing question.

Cellspin® **Cytocentrifuge**

Liquid	Min	Rpm.	Start-up speed (only for *Cellspin® II*)
Kidney punctate	10	1,000	Low level 7
Lavages	10	1,000	Low level 7
Liquor	10	1,000	Low level 7
Mamma-punctates	10	800	Middle level 8
Pleura	15	800	Middle level 8
Thyroid punktate	10	1,000	Low level 7
Iliac crest liquid	5	500	High level 9
Tumor liquid	5	500	High level 9
CD 4 Lymphocytes	5	500	High level 9
CD 8 Lymphocytes	5	500	High level 9
Urine	10	1,000	High level 9

Only for *Cellspin® II*: Recommended break modus for normal work: level 9

Immediately fix the preparation after removal.

Do not immerse in 95% ethanol if prepared cell monolayer is still wet, because the cells could run away.

37. Declaration of conformity

THARMAC
Cellspin®

CE IVD

Konformitätserklärung

Declaration of Conformity

Wir, die Firma THARMAC GmbH , DE 35647 Waldsolms, erklären hiermit in eigener Verantwortung, dass das nachfolgend aufgeführte Gerät und Zubehör zu einem In-vitro-Diagnostikum alle einschlägigen Anforderungen der Europäischen Richtlinie 98/79/EG einhält.

The THARMAC GmbH , DE 35647 Waldsolms hereby confirms at its sole responsibility that the instrument and accessories for an In-vitro diagnostic procedure IVD as listed below, meet all relevant requirements of the European Directive 98/79/EG.

CELLSPIN Zytozentrifuge

Insbesondere wird versichert, dass die grundlegenden Anforderungen gemäß Anhang I der Richtlinie

In Vitro Diagnostics Direktive - 98/79/EG

eingehalten werden.

We guarantee in particular that the basic requirements according to annex I of the Directive 98/79/EG are fulfilled.

Eingehalten werden die relevanten Abschnitte der folgenden Normen:

The products comply with the following standards:

EG-Richtlinien/Normen, EC guidelines/standards:
73/23/EWG, EN 61010-1, EN 61010-2-020
89/336/EWG + 92/31/EWG + 93/68/EWG, EN 61000-6-1, EN 55011, EN 61000-3-2, EN 61000-3-3
98/37/EG, EN ISO 12100-1, EN ISO 12100-2
98/79/EG

Diese Erklärung gilt für alle Produkte, die ab dem

This declaration applies to all products that have been marketed for the first time as of

01. Januar 2017

erstmalig in Verkehr gebracht werden und für die eine interne Freigabe erteilt wurde.

Die technischen Unterlagen werden bei den Herstellern aufbewahrt.

The manufacturer maintains the technical documentation.

Waldsolms, den 02.01.2017

Joachim Camrath
Sicherheitsbeauftragter MPG, THARMAC GmbH

THARMAC GmbH · Hasselborner Straße 19-21 · DE 35647 Waldsolms · Tel: 0049 6085-98 99 10 · Fax: 0049 6085-98 99 119
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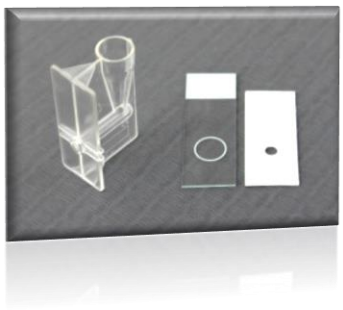
38. Conversion table

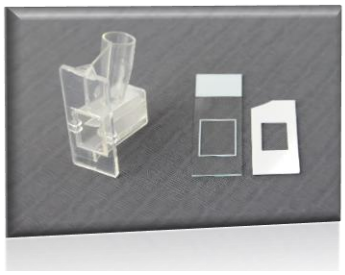
Speed	Force
rpm	(g)
500	28
600	40
700	55
800	72
900	91
1.000	112
1.100	135
1.200	161
1.300	189
1.400	219
1.500	252
1.600	286
1.700	323
1.800	362
1.900	404
2.000	447

39. Consumables for *Cellspin®* Cytocentrifuge

Category	Art.No.	Article	PU
Single Cellfunnel®		– sample volume: up to 0,5 ml – sedimentation field: 1 field, round, 6 mm in diameter	
	304	Single Cellfunnel® reusable	12
	305	Filter cards for Single Cellfunnel® 304 only	200
	310	Cytoslides slides with one circle, uncoated	100
	311	Cytotslides slides with one circle, coated	100
	320	Single Cellfunnel® disposable	100 500
	395	Single Cellfunnel® with brown filter card for samples up to 0,4 ml	50 100
Double Cellfunnel®		– sample volume: up to 2 x 0,5 ml – sedimentation field: 2 fields, round, 6 mm in diameter each – ideal for immunochemical examination	
	306	Double Cellfunnel® reusable	12
	307	Filter cards for Double Cellfunnel® 306 only	500
	309	Cytoslides slides with two circles, uncoated for Double Cellfunnel® 306 only	100
	312	Cytoslides slides with two circles, coated for Double Cellfunnel® 306 only	100
	316	Cytoslides slides with two offset circles, coated for Double Cellfunnel® 323 only	100
	317	Cytoslides Slides with two offset circles, uncoated for Double Cellfunnel® 323 only	100
	323	Double Cellfunnel® disposable, with two offset holes	100 500

Square / ECOfunnel®

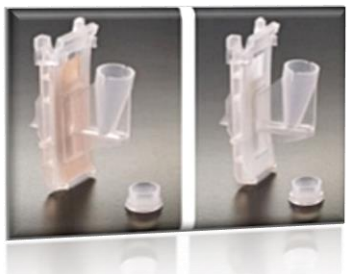
– sample volume: up to 6 ml
– sedimentation field: 1 field, rectangular, 22 x 15 mm



313	Square / ECOfunnel® reusable	12
314	Square- / ECO-slide Slide coated, for Square / ECOfunnel® 313 und 322 only	100
315	Square- / ECO-seal Seal for Square / ECOfunnel®	100
322	Square / ECOfunnel® disposable	100 500

EASY Single Cellfunnel®

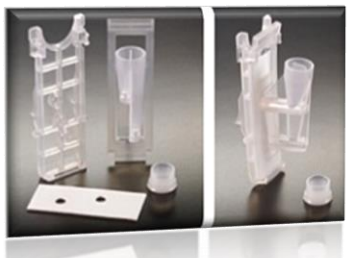
– sample volume: up to 0,5 ml
– sedimentation field: 1 field, round, 6 mm in diameter
– disposable sample chamber with disposable clip



1393	EASY Single Cellfunnel® with filter card disposable	40 200

EASY Double Cellfunnel®

– sample volume: up to 2x 0,5 ml
– sedimentation field: 2 fields, round, 6 mm in diameter each
– disposable sample chamber with disposable clip
– ideal for immunochemical examination



1395	EASY Double Cellfunnel® with filter card disposable	40 200

EASY Square / ECOfunnel®

– sample volume: up to 6 ml
– sedimentation field: 1 field, rectangular, 22 x 15 mm
– disposable sample chamber with disposable clip

1391	EASY Square / ECOfunnel® with filter card and Square- / ECO-slides disposable	40 200

All articles are also compatible with Shandon Cytospin®