Manual

Pellet Press PP25

Translation

1 Notes on the Operating Manual

This operating manual is a technical guide on how to operate the device safely and it contains all the information required for the areas specified in the table of contents. This technical documentation is a reference and instruction manual. The individual chapters are complete in themselves.

Familiarity (of the respective target groups defined according to area) with the relevant chapters is a precondition for the safe and appropriate use of the device.

This operating manual does not contain any repair instructions. If faults arise or repairs are necessary, please contact your supplier or get in touch with Retsch GmbH directly.

Application technology information relating to samples to be processed is not included but can be read on the Internet on the respective device's page at www.retsch.com.

Changes

Subject to technical changes.

1.1 Explanations of the safety warnings

In this Operating Manual we give you the following safety warnings

Serious injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.

⚠ WARNING

Type of danger / personal injury
Source of danger

– Possible consequences if the dangers are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:

⚠ WARNING

Moderate or mild injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.

⚠ CAUTION

Type of danger / personal injury
Source of danger

– Possible consequences if the dangers are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:

⚠ CAUTION

In the event of possible **property damage** we inform you with the word “Instructions” and the corresponding content.

NOTICE

Nature of the property damage
Source of property damage

– Possible consequences if the instructions are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word in the text or in the instructions on action to be taken:

NOTICE

1.2 General safety instructions

CAUTION

Read the Operating Manual
Non-observance of these operating instructions

– The non-observance of these operating instructions can result in personal injuries.

- **Read the operating manual before using the device.**
- **We use the adjacent symbol to draw attention to the necessity of knowing the contents of this operating manual.**

Target group : All persons concerned with the machine in any form

This machine is a modern, high performance product from Retsch GmbH and complies with the state of the art. Operational safety is given if the machine is handled for the intended purpose and attention is given to this technical documentation.

You, as the owner/managing operator of the machine, must ensure that the people entrusted with working on the machine:

- have noted and understood all the regulations regarding safety,
- are familiar before starting work with all the operating instructions and specifications for the target group relevant for them,
- have easy access always to the technical documentation for this machine,
- and that new personnel before starting work on the machine are familiarised with the safe handling of the machine and its use for its intended purpose, either by verbal instructions from a competent person and/or by means of this technical documentation.

Improper operation can result in personal injuries and material damage. You are responsible for your own safety and that of your employees.
Make sure that no unauthorised person has access to the machine.

CAUTION

Changes to the machine

– Changes to the machine may lead to personal injury.

- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

NOTICE

Changes to the machine

– The conformity declared by Retsch with the European Directives will lose its validity.

– You lose all warranty claims.

- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

1.3 Repairs

This operating manual does not contain any repair instructions. For your own safety, repairs may only be carried out by Retsch GmbH or an authorized representative or by Retsch service engineers.

In that case please inform:

The Retsch representative in your country
Your supplier
Retsch GmbH directly

Your Service Address:

2 Confirmation

This operating manual contains essential instructions for operating and maintaining the device which must be strictly observed. It is essential that they be read by the operator and by the qualified staff responsible for the device before the device is commissioned. This operating manual must be available and accessible at the place of use at all times.

The user of the device herewith confirms to the managing operator (owner) that (s)he has received sufficient instructions about the operation and maintenance of the system. The user has received the operating manual, has read and taken note of its contents and consequently has all the information required for safe operation and is sufficiently familiar with the device.
As the owner/managing operator you should for your own protection have your employees confirm that they have received the instructions about the operation of the machine.

I have read and taken note of the contents of all chapters in this operating manual as well as all safety instructions and warnings.

User
Surname, first name (block letters)
Position in the company
Signature

Service technician or operator
Surname, first name (block letters)
Position in the company
Place, date and signature

3 Transport, scope of delivery, installation

3.1 Packaging

The packaging has been adapted to the mode of transport. It complies with the generally applicable packaging guidelines.

3.2 Transport

NOTICE

Transport

– Mechanical or electronic components may be damaged.

• **The machine may not be knocked, shaken or thrown during transport.**

3.3 Temperature fluctuations and condensed water

NOTICE

Temperature fluctuations

The machine may be subject to strong temperature fluctuations during transport (e.g. aircraft transport)

– The resultant condensed water may damage electronic components.

• **Protect the machine from condensed water.**

3.4 Conditions for the place of installation

NOTICE

Ambient temperature

– Electronic and mechanical components may be damaged and the performance data alter to an unknown extent.

• **Do not exceed or fall below the permitted temperature range of the machine (5°C to 40°C / ambient temperature).**

3.5 Installation of the machine

Installation height: maximum 2000 m above sea level

3.6 Type plate description

Fig. 1: Type plate marking

1 Instrument name

2 Year of manufacture

3 Article number

4 Serial number

5 Manufacturer's address

6 CE marking

7 Waste disposal marking

8 Barcode

When making enquiries, please quote the name of the instrument (1) or the article number (3) and serial number (4) of the instrument.

4 Technical data

4.1 Use of the machine for the intended purpose

This manual hydraulic press for a 25-t pressure load is a Retsch laboratory instrument and is suitable for, among other things, preparing samples for X-ray fluorescence analysis and the potassium bromide pellet technique.

Safety discs made of polycarbonate and the ease in handling this press make it very user-friendly.

The pressure gauge has a 0-40-t scale with increments of 0.5 tonnes. The available working range amounts to a max. 147 mm.

(Spacing between the lower supporting space and the pressing face of the threaded spindle)

The die tool can be evacuated with an appropriate pump and vacuum hoses. To facilitate this, the die tool has a hose connection nipple for hoses with a nominal width of 8 mm.

NOTE

This press is suitable only for pressing tablets in sizes of 1¼ inch (32 mm) and 40 mm and ejecting them out of the die tool. It accommodates die tools for tablets in the sizes 1¼ inch (32 mm) and 40 mm.

4.2 Feed size

A fineness of <60µm or <40µm is recommended for the sample material for a subsequent X-ray fluorescence analysis of the sample pellet.

4.3 Pressure Range

0-25 t

4.4 Pressure Force

	Pressure on pellet in kg/cm^2 (pellet diameter in mm)						
Display (t)	**3**	**5**	**13**	**16**	**25**	**32**	**40**
0.5	7151	2500	381	258	100	65	39
1.0	14290	5000	763	506	200	129	78
3.0	-	15000	2290	1518	600	386	234
5.0	-	-	3890	2530	1000	645	390
10.0	-	-	7630	5060	2000	1290	781
15.0	-	-	-	7590	3000	1935	1172
20.0	-	-	-	10120	4000	2580	1563
25.0	-	-	-	12650	5000	3225	1953

4.5 Dimensions and weight

Height: up to approx. 400 mm

Width: up to approx. 360 mm

Depth : up to approx. 300 mm

Weight : net approx. 50kg

4.6 Required floor space

360 mm x 300 mm; no safety spacing required

5 Operating the machine

5.1 Views of the Instrument

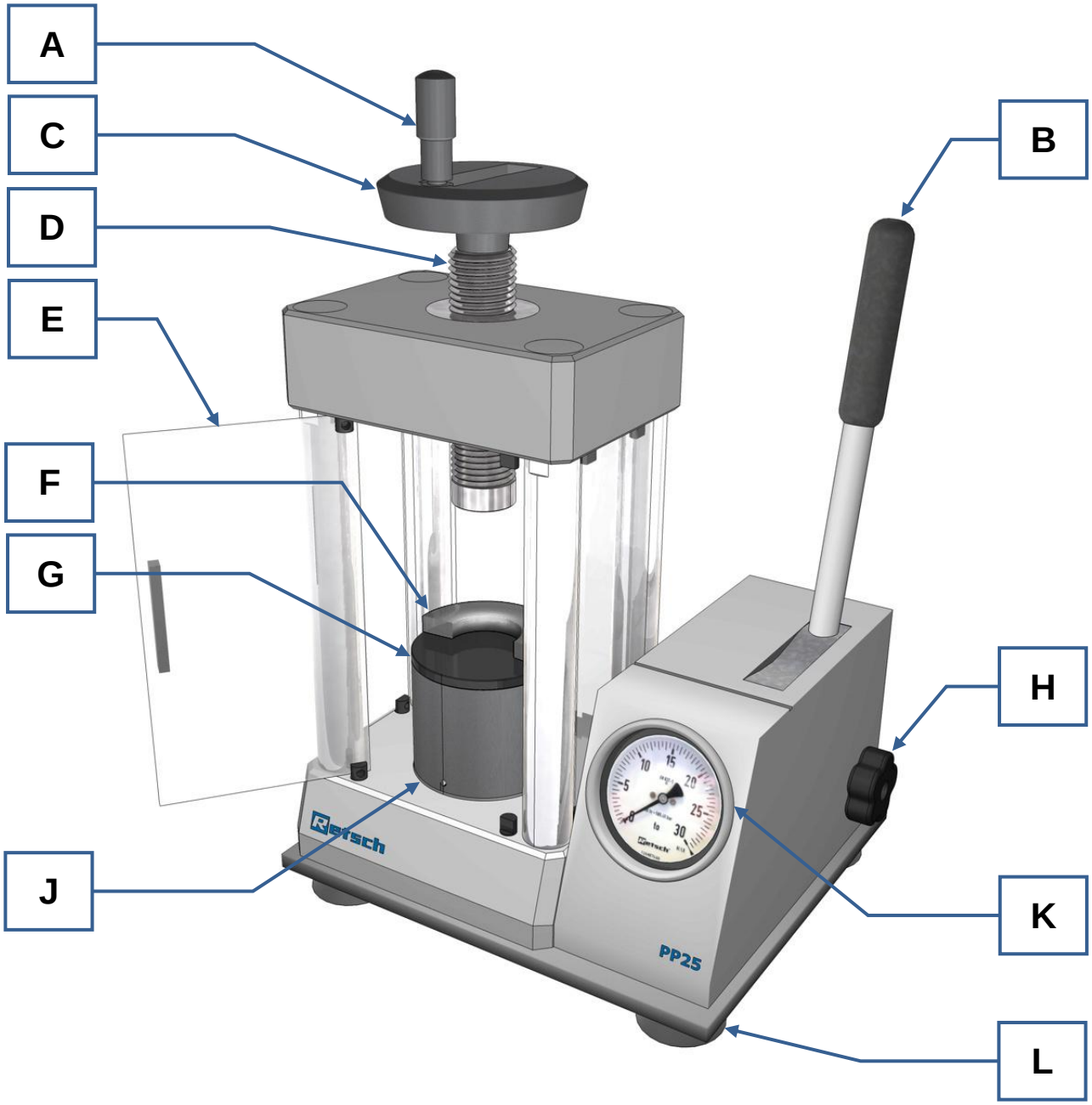

Fig. 2: Front view of the press

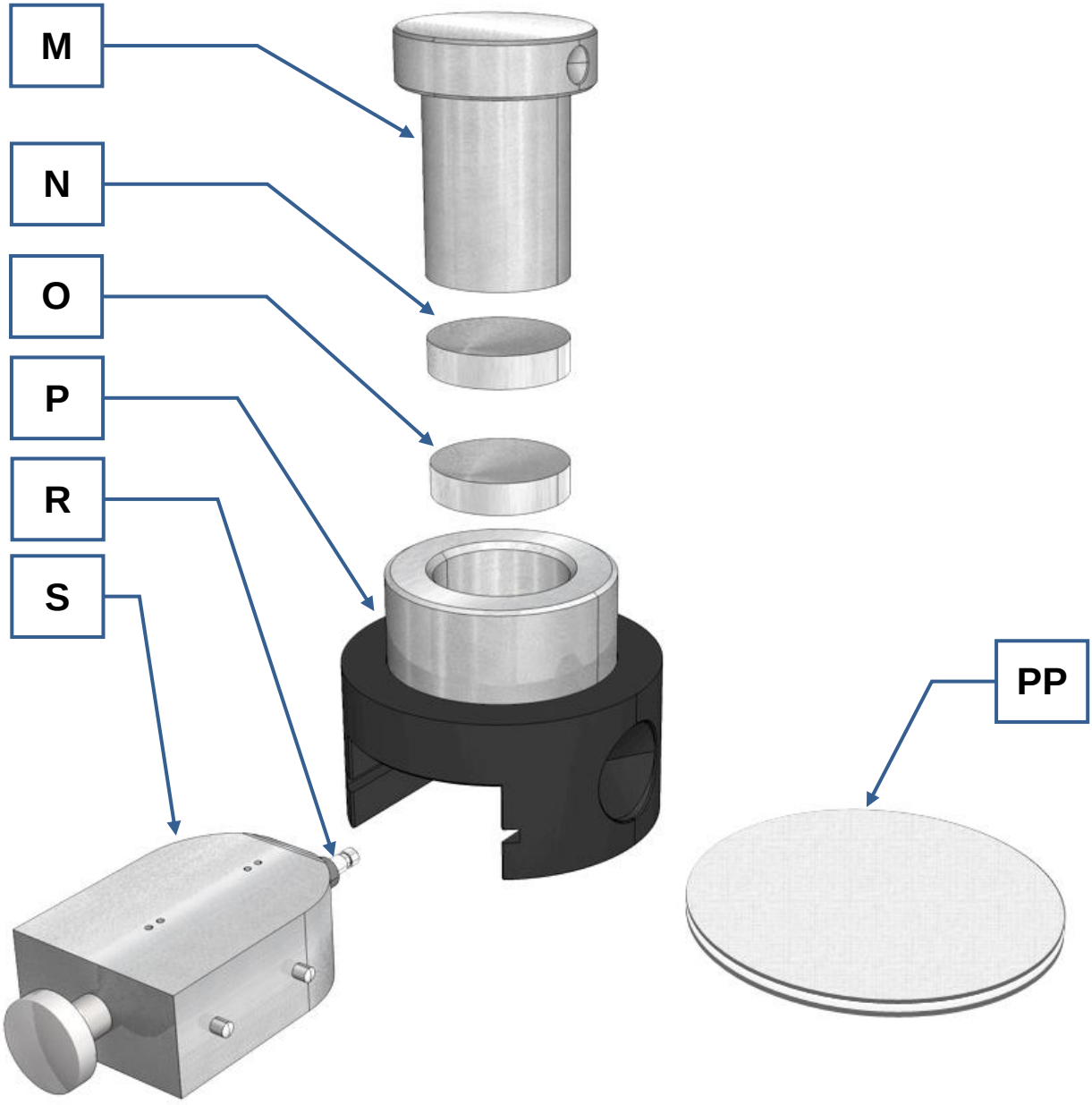

Fig. 3: View of the die tool

5.2 Overview table of the parts of the device

Element	Description	Function
A	Handle hand wheel	Grip for turning the hand wheel (hinged)
B	Hand lever	Lever for operating the pump
C	Hand wheel	For turning the spindle into the pressing position
D	Threaded spindle	For tensioning the die tool
E	Pressing chamber door	Protective equipment
F	Centring ring	Positioning aid for die tool (alternative use)
G	Die plate	Cover on the pressing cylinder
H	Shut-off valve	Valve for building up pressure
J	Pressure cylinder	Presses the sample against the spindle
K	Pressure display	Indicates the level of pressure in the hydraulic system
L	Suction cups	Hold the press in position
M	Plunger	Builds up pressure
N/O	Pressure piece	Surrounds the sample
P	Basic body of the die tool	Accommodates the pressing parts
R	Vacuum connection	Adapter for evacuation
S	Slide	Anvil for pellets
PP	Pressing plate	Plate to aid pellet ejection

5.3 Preparing the Sample Material

CAUTION

Danger of personal injury
Dangerous nature of the sample

– Depending on the dangerous nature of your sample, take the necessary measures to rule out any danger to persons.

• **Observe the safety guidelines and datasheets of your sample material.**

These degrees of fineness can be achieved e.g. by grinding in a ball mill , preferably in the Retsch PM100; PM200; PM400; RS200 or MM400.

In most cases, particularly where hard materials are concerned, some wax powder has to be mixed well with the ground sample before conducting the pressing procedure.

Usually 20% wax is mixed in with the sample material. The mixing ratio here is **1** part wax and **4** parts sample material.

Essentially, this improves the durability and surface of the pellets for the subsequent XRF analysis.

We recommend the Retsch MM400 for producing a homogeneous mixture of sample material and the wax. Use a plastic beaker made of polystyrenefor mixing (*Art. no. 22.041.0003*) and 4 grinding balls made of polyamide (*Art. no. 05.368.0042*).

The following parameters are recommended for the MM400 to ensure mixing instead of grinding.

- Time = 2.00 min
- Frequency = 15 Hz

5.4 Instructions on Handling the Die Tool and the Pressing Plates

NOTE

Sample residue clinging to the die tool can be very corrosive depending on the material and composition (e.g. salt residue) and cause irreparable damage to the die tool. Please therefore clean the entire die tool thoroughly with water and then with alcohol.

Store the die tool and its individual parts in as dry a place as possible until they are used again.

Never scratch the pressing plates with a sharp object. You can remove hardened sample residue with blotting paper or filter paper.

To protect the pressing plates, put them into the supplied boxes after cleaning.

5.5 Operating the Die Tool

5.5.1 Preparing the die tool

NOTE

Before using the die tool parts for the first time, please clean them with an organic detergent in order to remove any oil residue.

- Remove every bit of dirt from the die tool.

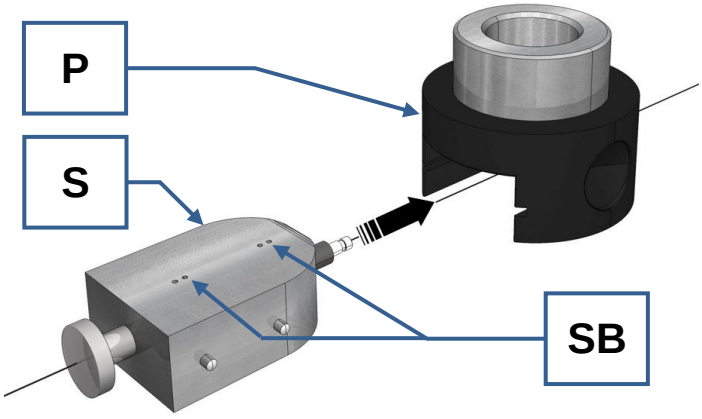

Fig. 4: Inserting the slide

- Push the slide (**S**) into the basic body of the die tool (P). The ventilation or evacuation boreholes (**SB**) should point upwards during this procedure.

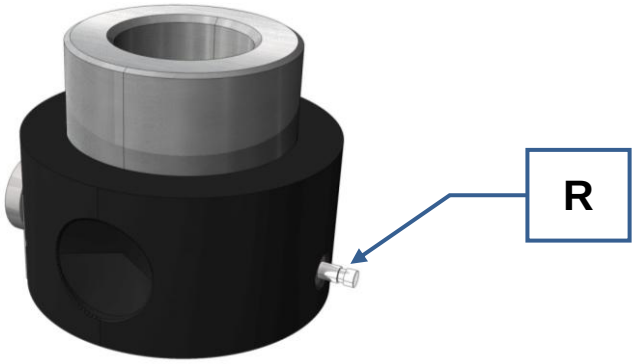

Fig. 5: Adapter for evacuating the die tool

NOTE

Make sure that the slide is pushed in as far as it will go. If you use the adapter (R) for evacuating the die tool, it must protrude out of the back of the basic body.

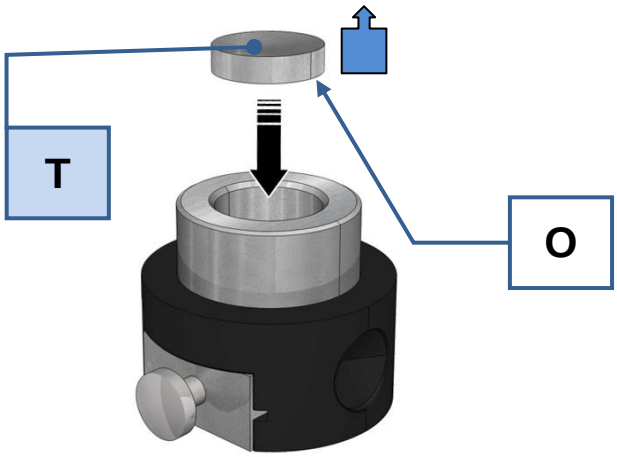

Fig. 6: Inserting the lower pressure piece

The pressure pieces are ground and polished on one side.

- Insert a pressure piece (**O**) with the ground and polished side (**T**) facing upwards.

Use an aluminium container to increase the durability of the pellets or if you have not mixed any wax with the sample.

- Insert an aluminium container if required.

5.5.2 Filling sample material into the die tool

- If necessary, remove the grinding balls out of the sample material mixed with wax.

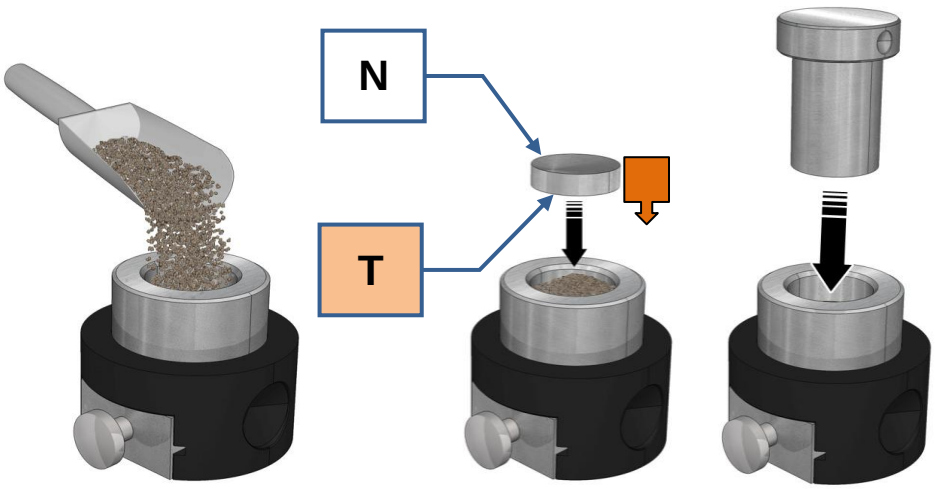

Fig. 3: Filling in the sample

- Fill the sample material into the die tool (approx. 15 grams).

The pressure pieces are ground and polished on one side.

- Insert the second pressure piece (**N**) with the ground and polished side (**T**) facing downwards.
- Insert the plunger (**M**) into the die tool.

Press the plunger (**M**) downwards so that the air cushion escapes.

5.5.3 Pressing the tablet

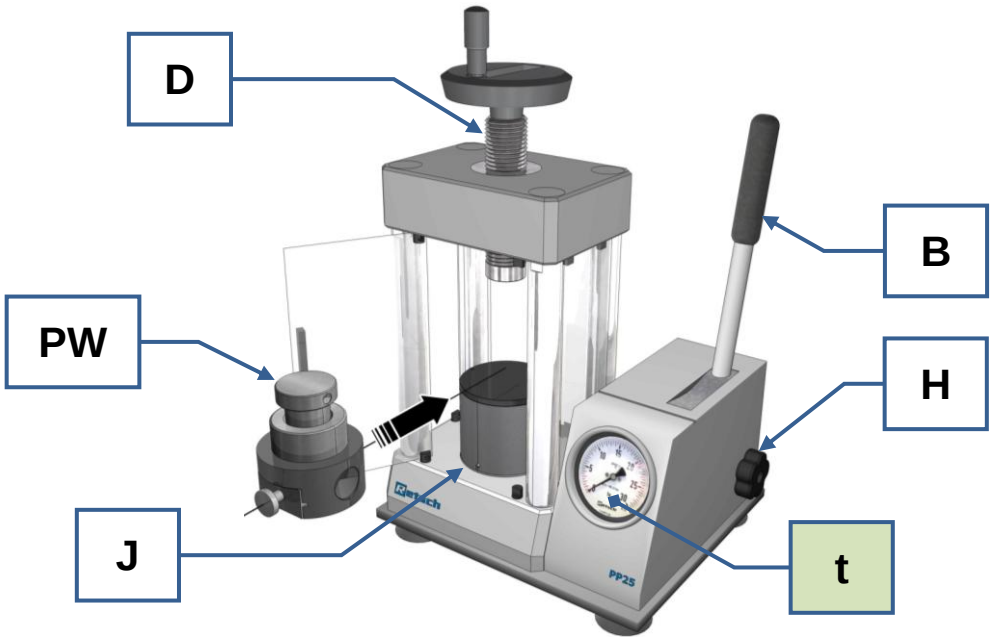

Fig. 4: Inserting the die tool

NOTE

Damage to the seals and constant loss of pressure

A constant build-up of pressure while the cylinder (**J**) is moved out to the full extent damages the seals. There is a fine groove on the cylinder. This groove should not be visible while the pressure is building up.

Avoid, extending the cylinder to its maximum height while the pressure is building up.

- Turn the threaded spindle (**D**) upwards.
- Put the die tool (**PW**) on the pressure cylinder (**J**).
- Turn the threaded spindle downwards until it rests on the die tool.
- Close the valve (**H**) by turning in a clockwise direction.
- Build up the required pressure force (**t**) by moving the hand lever (**B**) forwards and backwards.

5.5.4 Removing the Die Tool and Tablet (1)

NOTE

A quick drop in pressure can cause the pellets to break.

- Open the shut-off valve (**H**) very slowly by turning in an anti-clockwise direction.

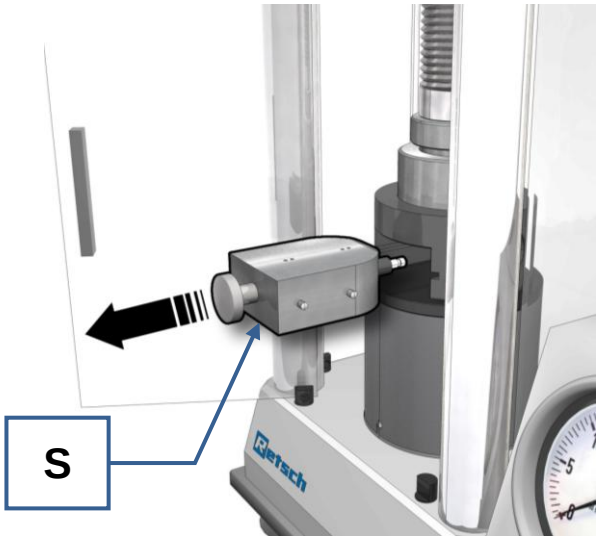

Fig. 5: After the Pressing Procedure

- Pull the slide (**S**) out of the die tool.

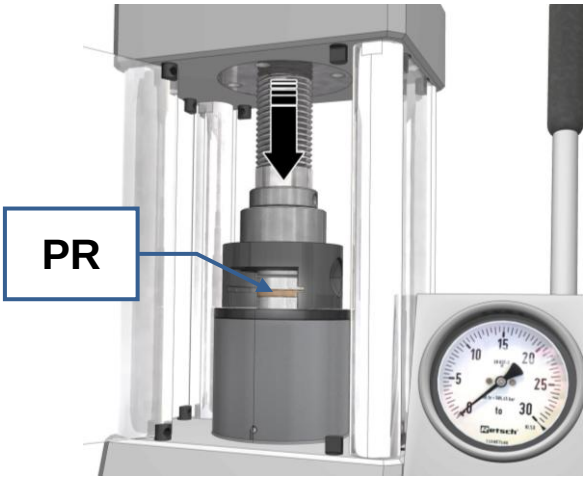

Fig. 6: Ejecting the pellet

- Close the valve (**H**) by turning in a clockwise direction.

- Build up some pressure force by moving the hand lever (**B**) forwards and backwards until the pellet (**PR**) along with the pressure pieces fall out of the die tool.
  - Alternatively, you can press the pellet out of the die tool by turning the threaded spindle (**D**).
- Open the shut-off valve (**H**) by turning in an anti-clockwise direction.

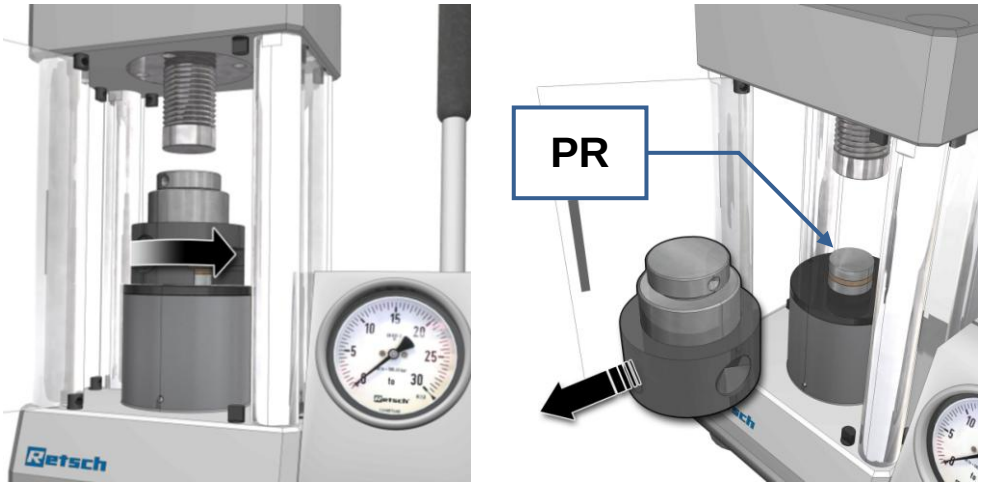

Fig. 7: Turning the die tool to allow removal

- Turn the die tool backwards by 180°.
- Remove the die tool.
- Then clean the die tool.

5.5.5 Instructions on Handling the Die Tool and the Pressing Plates

NOTE

Depending on the material and its composition, sample residue (e.g. salt residue) clinging to the die tool can be very corrosive and cause irreparable damage to the die tool. Please therefore clean the entire die tool thoroughly with water and then with alcohol.

Store the die tool and its individual parts in as dry a place as possible until it is next used.

Never scratch the pressing plates with a sharp object. You can remove hardened sample residue with blotting or filter paper.

After cleaning them, keep the pressing plates in the accompanying boxes as protection.

5.6 Die Tool – Alternative Insertion

In samples

- in which you cannot mix in any wax to stabilise the pellet or
- in unstable samples that are hard to compress

an alternative method of using the die tool is recommendable. This prevents pellets falling when they are being ejected.

- Prepare the die tool and the sample as described in the previous chapter.

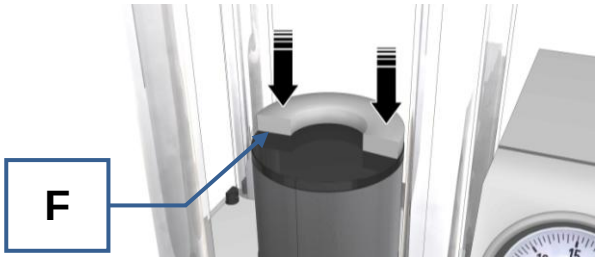

Fig. 8: Inserting the centring aid

- Insert the centring aid (**F**) if required.

⚠ CAUTION

Risk of fingers being pinched.

The plunger is loose! This means that there is a risk of the plunger (**M**) dropping downwards when the die tool is being inserted.

- **Hold the plunger** (**M**) **securely when inserting the die tool!**

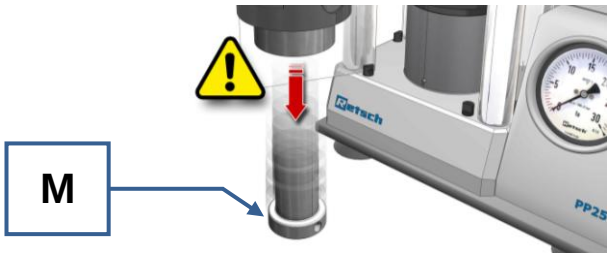

Fig. 9: The plunger drops down

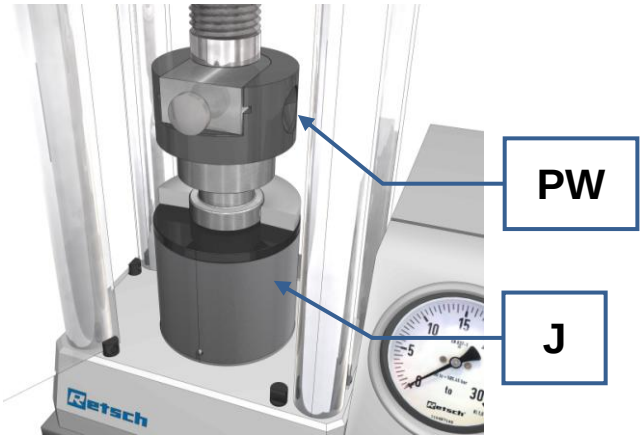

Fig. 10: Inserting the die tool in a turned position

- • Using the slide, move the die tool (PW) upwards onto the pressure cylinder (**J**).
- Close the valve (**H**) by turning in a clockwise direction.
- Build up the required pressure force (**t**) by moving the hand lever (**B**) forwards and backwards.

5.6.1 Removing the Die Tool and Tablet (2)

NOTE

A quick drop in pressure can cause the pellets to break.

- Open the shut-off valve (H) very slowly by turning in an anti-clockwise direction.

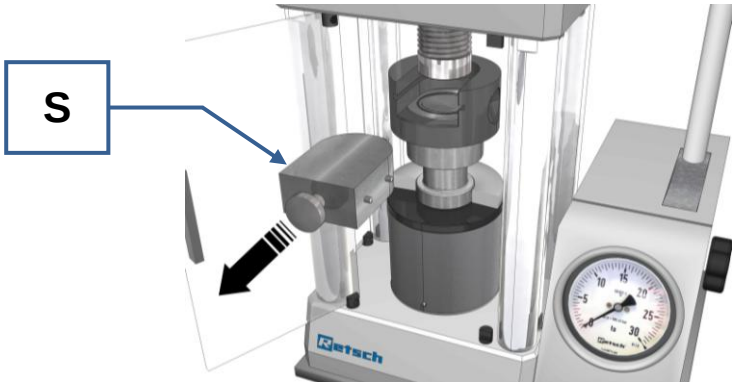

Fig. 11: After the pressing procedure

- Pull the slide (**S**) out of the die tool.

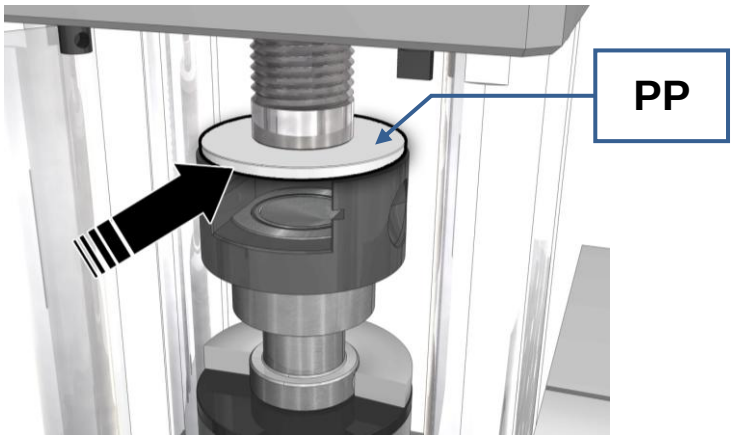

Fig. 12: Inserting the pressing plate

- Turn the spindle upwards to some degree.
- Place the pressing plate (**PP**) onto the die tool.
- Close the valve (**H**) by turning in a clockwise direction.

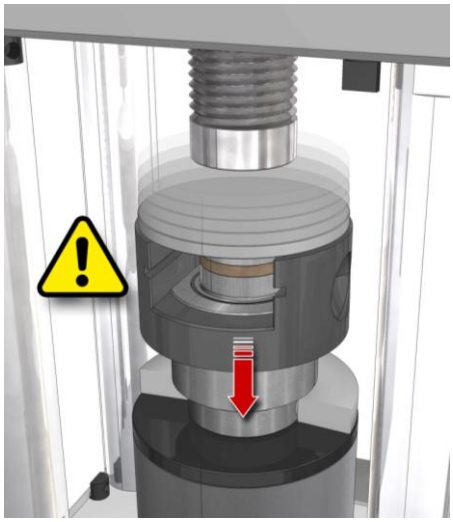

Fig. 13: Alternative ejection of the pellets

⚠ CAUTION

Risk of fingers being pinched

The (P) die tool's basic body drops downwards as the pellets are being ejected.

- **Make sure that you do not have any fingers between the basic body and the plunger!**
- Build up some pressure force by moving the hand lever (B) forwards and backwards until the pellet (**PR**) and the pressure pieces are ejected from the die tool.
- Open the shut-off valve (**H**) by turning in an anti-clockwise direction.
- Remove the pressing plate.

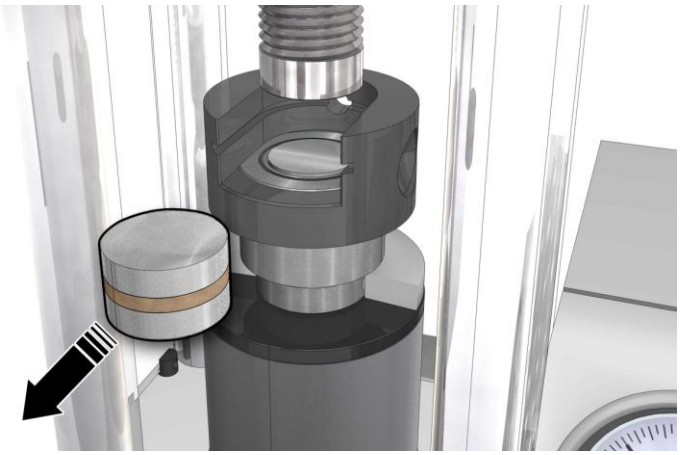

Fig. 14: Removing the pellet

- Remove the pellet.

⚠ CAUTION

Risk of fingers being pinched

The plunger is loose! This means that there is a risk of the plunger (**M**) dropping downwards when you take the die tool out.

- **Hold the plunger (M) securely when removing the die tool!**

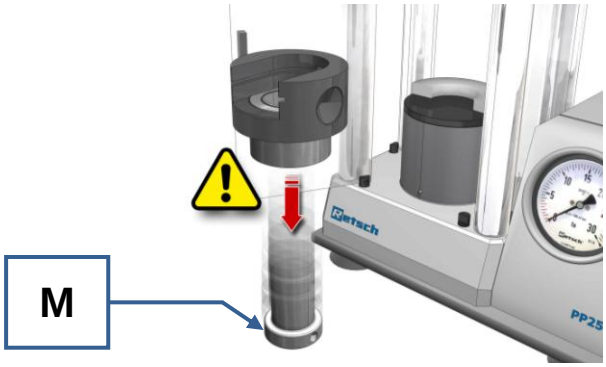

Fig. 15: The plunger falls down

5.7 Ventilation

- Remove the die tool.
- Close the side shut-off valve (**H**) by turning in a clockwise direction.
- Move the pump lever (**B**) very slowly several times forwards and backwards until the pressure cylinder (**J**) moves approximately 1-2 mm upwards.
- Now open the shut-off valve in an anti-clockwise direction. This moves the pressure cylinder downwards again.

- Repeat these steps two or three times to remove all air bubbles out of the press. Then conduct a pressure test.

  (See the following Chapter on the pressure test)

If you do not reach the required pressure of 25 tonnes during the pressure test, there must be air in the press still. In that case, proceed as follows:

- Remove the die tool.

Fig. 16:

- Pull the cylinder plate (**G**) upwards and off.
- Use the supplied hex key to loosen the ventilation screw (**ES**).
- Close the shut-off valve (**H**).
- Using the lever (**B**), pump very slowly until oil appears in the ventilation opening (**ES**).

It may be necessary to wait until no more air bubbles rise upwards.

- Then tighten the screw (**ES**) again and insert the pressing plate (**G**) again.

5.8 Pressure Test

- Close the shut-off valve (**H**) by turning in a clockwise direction.
- Then pump by moving the hand levers forwards and backwards until a pressure of at least 25 t is indicated in the pressure display.

5.9 Overpressure relief

There is an overpressure relief valve inside the press. This is set to 25-t. The overpressure relief valve may be set only in the factory.

If the hand lever (**B**) is actuated when the set pressure of 25 t is actuated again, the safety valve prevents damage to the press.

6 Cleaning and service

6.1 Cleaning

Do not clean the press with running water. Use only a cloth dampened with water.

Do not use any solvents or aggressive cleaning agents!

6.2 Service

The press is for designed for many yearsof operation and requires only very little servicing . From time to time, you should check if the threaded spindle on the press can move easily.

- Clean and oil the press as required.

No further maintenance is needed.

7 Disposal

Please observe the respective statutory requirements with respect to disposal.

Information on disposal of electrical and electronic machines in the European Community.

Within the European Community the disposal of electrically operated devices is regulated by national provisions that are based on the EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Accordingly, all machines supplied after 13.08.2005 in the business-to-business area to which this product is classified, may no longer be disposed of with municipal or household waste. To document this they have the following label:

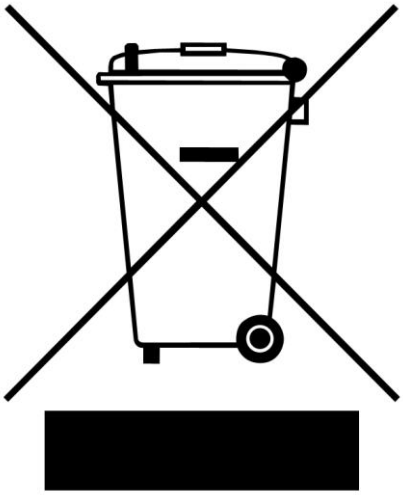

Fig. 17: Disposal label

Since the disposal regulations within the EU may differ from country to country we would request you to consult your supplier.

8 Index