

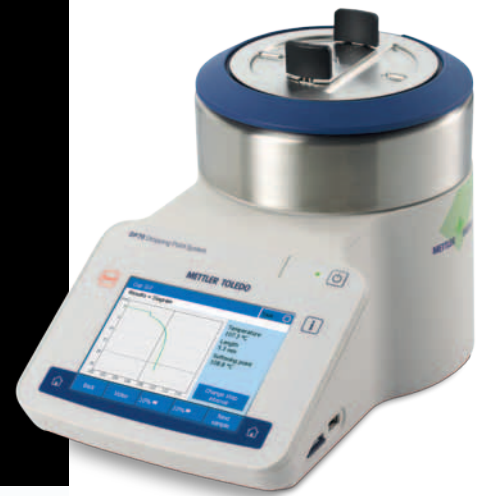
Thermal Value Excellence



**Excellence**  
**Dropping Point Systems**

DP70

DP90



## **Dropping and Softening Point Determination**

Simple, Standard-Compliant, Video-Recorded

**METTLER TOLEDO**

# Dropping Point Determination

## Automatic, Exact, Comparable

**With the innovative METTLER TOLEDO dropping point systems, you can determine dropping and softening points of pitch, asphalt, polymers, resins, waxes and many more materials with full automatic operation. Standard compliant cups and measurement methods guarantee comparable results.**

### Unmatched measurement principle

The instrument can be operated in two different modes: determination of dropping point or softening point. Visual camera observation and digital image analysis guarantee that the result values are reliable.

The high resolution color videos recorded during the measurement can be repeatedly played back on the instrument. This allows you to check unexpected results by visually verifying the measurements.

### Reliable results

Simultaneous analysis of two samples delivers the mean value and the difference of the single results. Result round off can be preselected per the method.

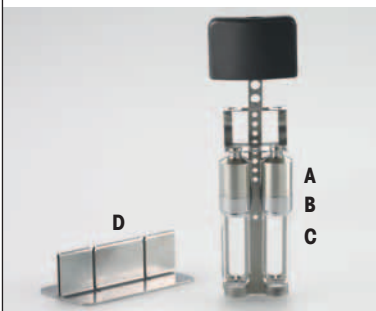
Measurements can include conformity checks and automatic printout of results in one simple step, which prevents transcription errors and operator bias that occur with manual analysis methods.

### Conformity with current standards

Operation according to standards of the American Society for Testing and Materials (ASTM International), European Pharmacopeia and further standards makes it easier to compare measurement results.

You can use all the cups specified in these standards with the innovative sample carrier.

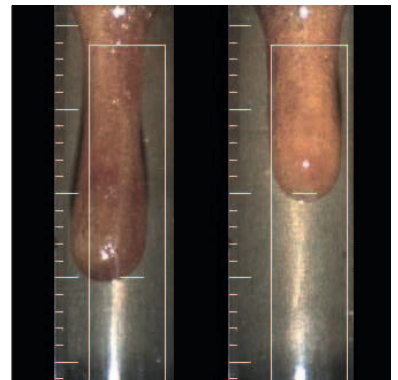
### Innovative Sample Carrier – increases efficiency, safety and accelerates measurement workflow



The three marked parts are:

- A** closed cup lid with vent hole prevents spilling and furnace contamination in case of expanding sample
- B** Standard compliant cup for dropping or softening point determinations
- C** disposable glass collector

The sample carrier keeps all parts together and can be placed into the stand **D** which is delivered with the instrument.



Softening of colophony. Scaling shown in mm, the white frame displays the evaluation area, while the bottom white line indicates the current edge detection.



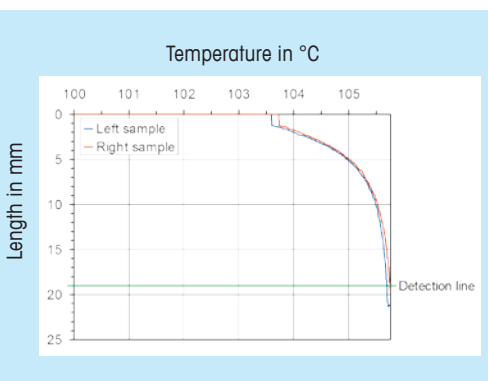
#### Tar balls

analyzed with: DP70

suitable standards: ASTM D3104, ASTM D3461

#### Performance at a glance:

- **One click and superior ergonomics** – quick to learn, easy to operate
- **Simultaneous measurement of 2 samples** – increases productivity
- **Convenient playback of high resolution color videos** – offers maximum insight
- **Compliant to standards** – ensures trustworthy measurements and results



Length diagram of a duplicate determination of the softening point. The steeper the slope (indication of the flow speed) the lower the viscosity.

#### Dropping and softening point and its detection

The dropping point (DP) is a characteristic property of a material. It is the temperature at which the first drop of a substance falls from a cup under defined test conditions.

The softening point (SP) is the temperature at which a substance has flowed a certain distance under defined test conditions. Depending on the substance softening it may be necessary to promote the flow by applying a ball weight. The instrument also generates a novel length diagram which indicates the rheological behavior of the sample.

Samples are heated until they transform from a solid to a liquid state. Dropping and softening points are mainly used in quality control but can also be valuable in research and development for determination of use temperatures and process parameters of many different materials.

# Determine the Dropping Point with just One Click™

- **Easy to use**
- **Efficient**
- **Secure**

## One click results

Dropping point determination has never been so easy! The color touch screen allows one finger intuitive operation, provides clear information for the user, and can be easily seen from a distance. Just one click is all that is needed to start the measurement – the instrument does the rest for you. While the measurement is being performed, you can attend to other important tasks. When completed, the instrument signals the end of the measurement with an acoustic tone and displays the measured results.

## Measure rapidly and economically

You can achieve high throughput by simultaneously determining two samples in one run. One Click enables you to start the measurement quickly after easy sample preparation with the tool included in the standard delivery. Perform different measurement tasks rapidly and efficiently by working with up to 60 stored methods. Economic single use cups and heating without water or oil baths eliminate the need for tedious cleaning.

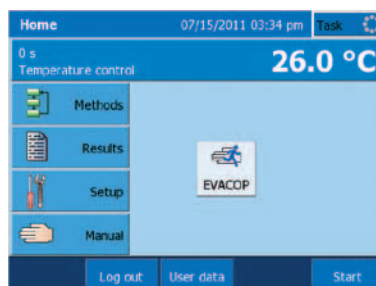
## Complete result documentation

All results are securely archived and can be tracked at any time. Whether you print out results on a strip or network printer, save reports as PDF, or directly transfer all result files including video to a PC, you always get the maximum information possible from your measurements. In addition the result file in CSV format (comma separated values) enables the read-out of selected data by LIMS-software.

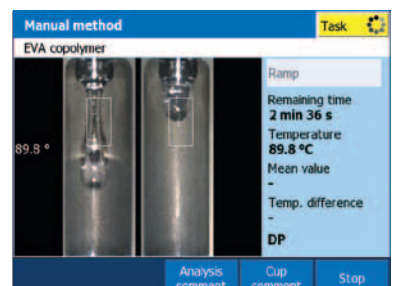
## The following sequence of images illustrates a typical analysis



Filling cups with the sample preparation tool. Four samples can be prepared simultaneously and the special design prevents contamination of the outer surface of the cups.



The home screen. Once programmed the One Click shortcut key "EVACOP" can be used to start the measurement immediately.



The online screen. Live image of the video of an EVA copolymer duplicate determination. In the right area the status of the experiment and results are displayed.





**Polypropylene**  
 analyzed with: DP70  
 suitable standard: ASTM D3954



Data output. Videos and CSV files are stored on the SD-card. A USB flash drive can be used to transfer the PDF result files.

### Determination of the dropping point of polyolefines

A generally accepted procedure for the determination of use properties of raw polymers is the dropping point. Homo- or copolymer pellets or powders with a defined dropping point can be tested. The samples are premelted and filled into the cups sitting in the sample preparation tool which is preheated in a dry oven. The automatic, unattended dropping point determination using the DP70 provides quick and reliable measurements. Carrying out the analysis according to ASTM D3954 guarantees excellent comparability of the results.

# More Application Possibilities

## Wider Temperature Range

**Dropping point determinations at subambient temperatures can only be performed using a DP90 Dropping Point System. It consists of a control unit and a separate measuring cell, which can be placed into a refrigerator or deep freezer.**



### Reliable measurements in pharma, cosmetics and food industry

The DP90 combines all the advantages of a DP70 with the possibility to start a measurement from -20 °C.

The excellent furnace insulation and a LED light source prevent self warming of the measuring cell and ensure a stable minimum temperature.

Determinations that were previously carried out manually (e.g. according to ASTM D127 or DIN 12785) can now be easily substituted by the automatic method.

Raw ingredients for creams, suppositories, ointments and edible oils and fats can be characterized.

Access control with username and password, duplicate determination and perfect result documentation are only a few equipment features which support regulatory compliance.

### Application table

Application area	Operation mode	Standard	DP70	DP90
Pitch	SP	ASTM D3104, ASTM D3461	•	•
Asphalt	SP	ASTM D3461	•	•
Polyolefines	DP	ASTM D3954	•	•
Resins	SP	ASTM D6090	•	•
Waxes	DP	ASTM D3954, Ph. EUR 2.2.17	•	•
Paraffins	DP	Ph. EUR 2.2.17	•	•
Binders	SP	DIN 51920, ISO 4625-2	•	•
Lubricating greases	DP	IP 396	•	•
Organic powders	DP		•	•
Vaseline	DP	Ph. EUR 2.2.17	◦	•
Edible fats	DP	AOCS Cc 18-80		•
Edible oils	DP	AOCS Cc 18-80		•

SP softening point, DP dropping point, • suitable, ◦ partly suitable

## Comparison Table Excellence Dropping Point Systems



**DP70**



**DP90**

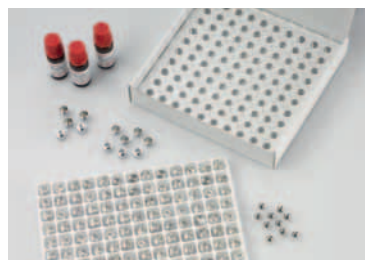
Instrument format	Standalone instrument	Control unit with external measuring cell
Temperature range	RT to 400 °C	-20 °C to 400 °C
Measurement accuracy	-20...30 °C	± 0.4 °C
	30...200 °C	± 0.2 °C
	200...max. temperature	± 0.5 °C
Heating rate	0.1 to 20 °C per minute	0.1 to 20 °C per minute
Sample throughput (duplicate determination)	12 per hour	12 per hour
Cups	number	Up to 2
	dimensions (orifice)	2.8 / 6.35 mm
Single use cups	Aluminum polished	Aluminum polished
Display	5.7" VGA color touch screen	5.7" VGA color touch screen
Languages	English, German, Chinese, Japanese, Spanish, French, Russian, Portuguese	
Video	Color AVI Magnification 2.5x	Color AVI Magnification 2.5x
Max. run time per Video	60 min	60 min
Replay on the instrument	Yes	Yes
Video export	on SD card or to PC	on SD card or to PC
Length diagram (SP)	Yes	Yes
User Management	Yes	Yes
Shortcuts (One Click™)	12 per user	12 per user
Max. number of methods	60	60
Substance database	Up to 100 substances	Up to 100 substances
Number of permanently stored results	Last 100	Last 100
PDF report generation	Yes	Yes
Print options	Strip printer or selected network printers	Strip printer or selected network printers
Power	120 W	120 W
Dimensions WxLxH in cm	19x35x23	measuring cell 13x25x21 control unit 19x35x15
Weight in kg	4	7

## Accessories

DP Accessories box



Consumables



USB-P25 compact printer



Service



# Whatever the Task

## We have the Right Answer

**METTLER TOLEDO manufactures a wide array of solutions for routine applications, quality assurance, and research and development. This is supported by competent assistance, extensive applications know-how and innovative accessories.**



### Thermal Value Excellence

The innovative METTLER TOLEDO melting point system offers simple and efficient determination of the melting point or melting range thanks to built-in video observation.



### Thermal Analysis

Complete range (DSC, TGA, TMA and DMA) of innovative, modular thermal analysis systems for almost any task in materials characterization.



### Density and Refractive Index

From simple portable meters to fully automatic multi parameter systems, METTLER TOLEDO offers flexible solutions for density and refractive index measurements in the laboratory and on site.



### Titration

The Excellence family of titrators provides highly automated state-of-the-art solutions for a wide range of routine to complex titrations and Karl Fischer moisture content determination.



### Halogen Moisture Instruments

The METTLER TOLEDO halogen moisture instruments are made for fast and reliable moisture analysis in laboratory and production environments.

[www.mt.com/fp](http://www.mt.com/fp)

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