

**Task:****Application field:** Food / Feed**Material:** Ground Coffee**Feed size:** 30-800 µm**Feed quantity:** 50 g (about 120 ml) for each test**Material specification(s):** dry, oily**Customer requirements(s):** Method development to allow sieve analysis with vibratory sieving**Subsequent analysis:** Particle size analysis**Solution****Selected Instrument(s):** Vibratory Sieve Shaker AS 200 control**Configuration(s)****Item nos.:**

1 x Vibratory Sieve Shaker AS 200 control, 100-240 V, 50/60 Hz, incl. test report, acc. EN 10204 2.2

1 x Clamping device "comfort" for test sieves 200/203 mm ø

1 x Collecting pan stainless steel, ø 200x50 mm

1 x Test Sieve, ISO 3310/1, 200x50mm, 32µm, stainless steel, with compliance certificate acc. EN 10204 2.1

1 x Test Sieve, ISO 3310/1, 200x50mm, 125µm, stainless steel, with compliance certificate acc. EN 10204 2.1

1 x Test Sieve, ISO 3310/1, 200x50mm, 250µm, stainless steel, with compliance certificate acc. EN 10204 2.1

1 x Test Sieve, ISO 3310/1, 200x50mm, 500µm, stainless steel, with compliance certificate acc. EN 10204 2.1

1 x Test Sieve, ISO 3310/1, 200x50mm, 800µm, stainless steel, with compliance certificate acc. EN 10204 2.1

1 x Test Sieve, ISO 3310/1, 200x50mm, 1.00mm, stainless steel, with compliance certificate acc. EN 10204 2.1

1 x Balls, steatite, 6 mm ø, 150 g

1 x Evaluation software EasySieve, version 5 / USB stick, incl. adapter USB-RS232, for Windows 10 64 Bit

Please note: Other electrical versions of the instrument(s) are available with different item numbers.

**Parameter(s):** Amplitude 1.2 mm, interval 10 s**Time:** 5 and 10 min**Achieved result(s):** Reasonable results based on vibratory sieving only can be achieved with a degreased sample.  
see measurement protocol EasySieve

**Remark(s):**

A sieve analysis of the original sample based on vibratory sieving is not possible as the fat content causes the sample to agglomerate on the sieves and thus blocks the apertures (see pictures). Even after 20 min sieving time an end point cannot be detected.

Therefore the sample needs to be degreased: 50 g ground coffee is gently stirred in about 200 ml heptane for 10 min. The slurry is filtered and washed with additional 50-100 ml heptane. The remaining powder is dried and used for the sieve analysis.

To improve the sample's passage 3 steatite balls are added on each sieve < 200 µm. The end point is reached after 10 min sieving time.

**Recommendation:**

The Vibratory Sieve Shaker AS 200 control is suitable to separate the sample material under the above mentioned conditions.

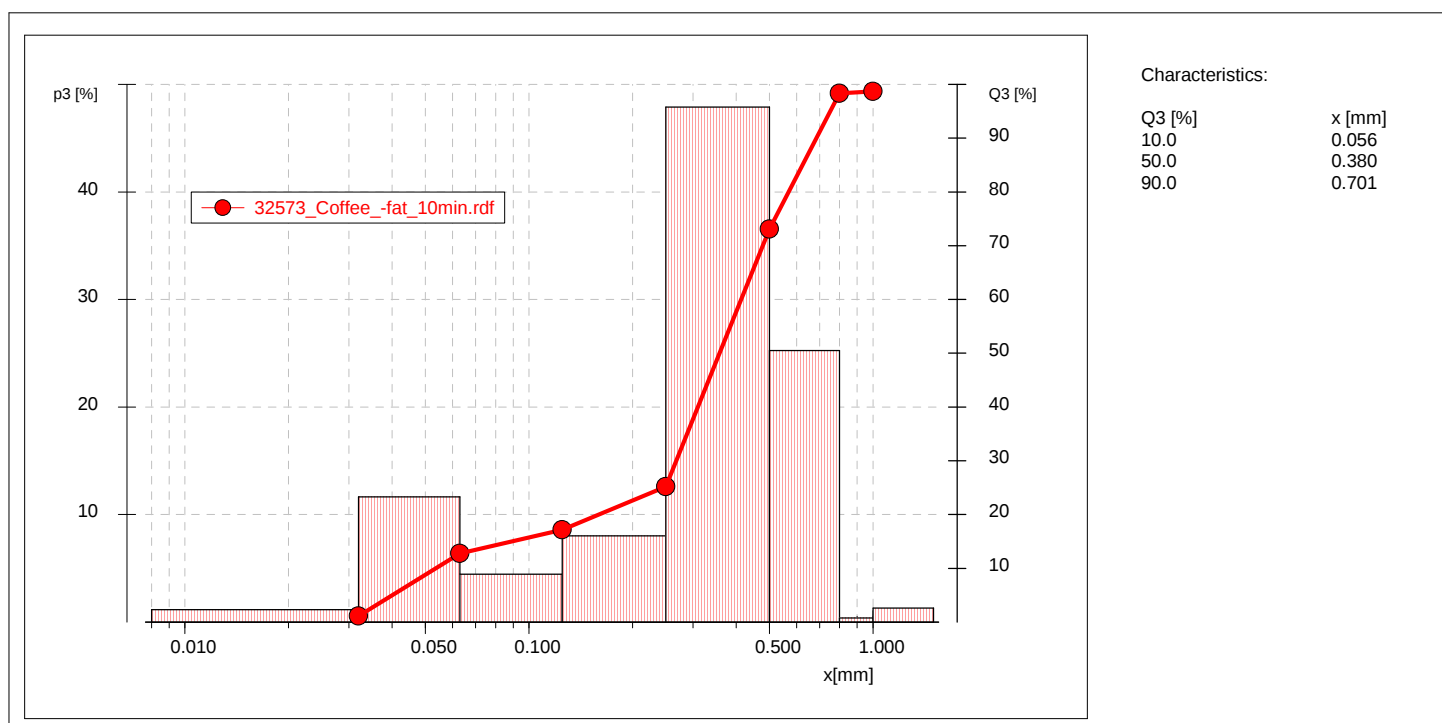
## Pictures of the sample:

**Picture 1: Sieve surface of a 250 µm test sieve after 5 min sieving of non-degreased coffee. The apertures are blocked by agglomerated fine particles**

## Retsch Sieve Analysis

|                                    |                                                                |                           |                               |
|------------------------------------|----------------------------------------------------------------|---------------------------|-------------------------------|
| Company:                           | Retsch GmbH                                                    |                           |                               |
| User:                              | GBE                                                            |                           |                               |
| Result file:                       | C:\EasySieve\SIEVEDAT\32573_Coffee\32573_Coffee_-fat_10min.rdf |                           |                               |
| Task file:                         | 32573_Coffee.afg                                               | GKL file:                 | 32573_Coffee.gkl              |
| Date:                              | 30.11.2023 08:36                                               | Sieving duration [mm:ss]: | 10:00                         |
| Sieve shaker:                      | AS 200 control                                                 | Amplitude [mm]:           | 1.2                           |
| Interval operation                 |                                                                | Interval time [s]:        | 10.0                          |
| Manual input:                      | Yes                                                            |                           |                               |
| Material:                          | ground coffee                                                  |                           |                               |
| Sample quantity [g]:               | 40.60                                                          | Backweighing [g]:         | 40.59                         |
| Sieve loss [%]:                    | 0.02                                                           |                           |                               |
| Sampling:                          | random                                                         | Sample preparation:       | No sample preparation RT 6.35 |
| Sieving method:                    | three-dimensional AS 200                                       | Test sieve size:          | 200 x 50 mm                   |
| Test sieves according to standard: | DIN ISO 3310-1                                                 | Sieving aids:             | Spheres on sieves < 200 µm    |
| Comment:                           | defatted with n-heptane                                        |                           |                               |

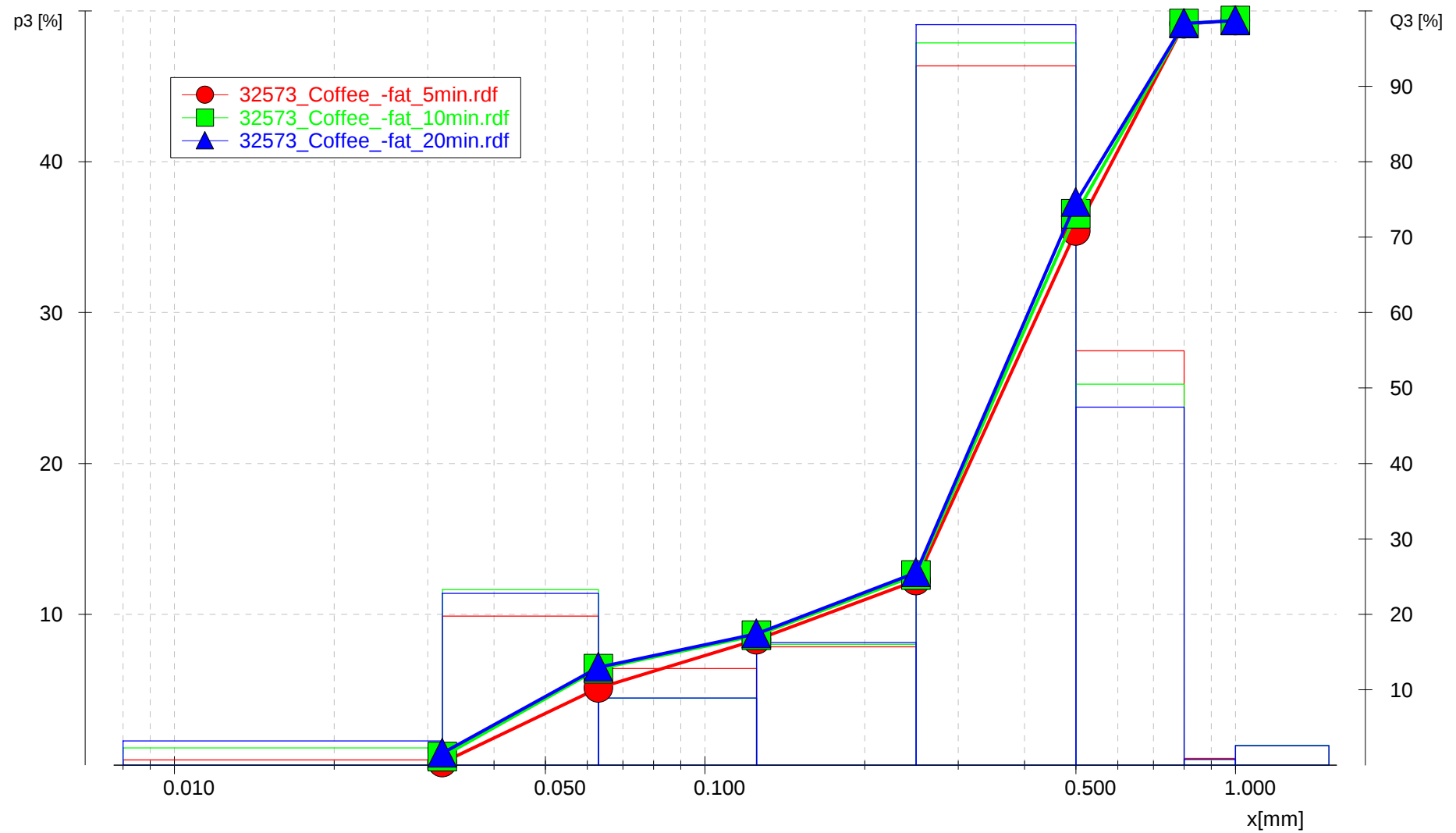
| Size class | [mm]  | p3 [%] | Q3 [%] | Δm [g] | ΣΔm [g] |
|------------|-------|--------|--------|--------|---------|
| <          | 0.032 | 1.1    | 1.1    | 0.46   | 0.46    |
| 0.032 -    | 0.063 | 11.6   | 12.8   | 4.72   | 5.18    |
| 0.063 -    | 0.125 | 4.4    | 17.2   | 1.80   | 6.98    |
| 0.125 -    | 0.250 | 8.0    | 25.2   | 3.25   | 10.23   |
| 0.250 -    | 0.500 | 47.9   | 73.1   | 19.43  | 29.66   |
| 0.500 -    | 0.800 | 25.3   | 98.3   | 10.25  | 39.91   |
| 0.800 -    | 1.000 | 0.4    | 98.7   | 0.15   | 40.06   |
| > 1.000    |       | 1.3    | 100.0  | 0.53   | 40.59   |



User:

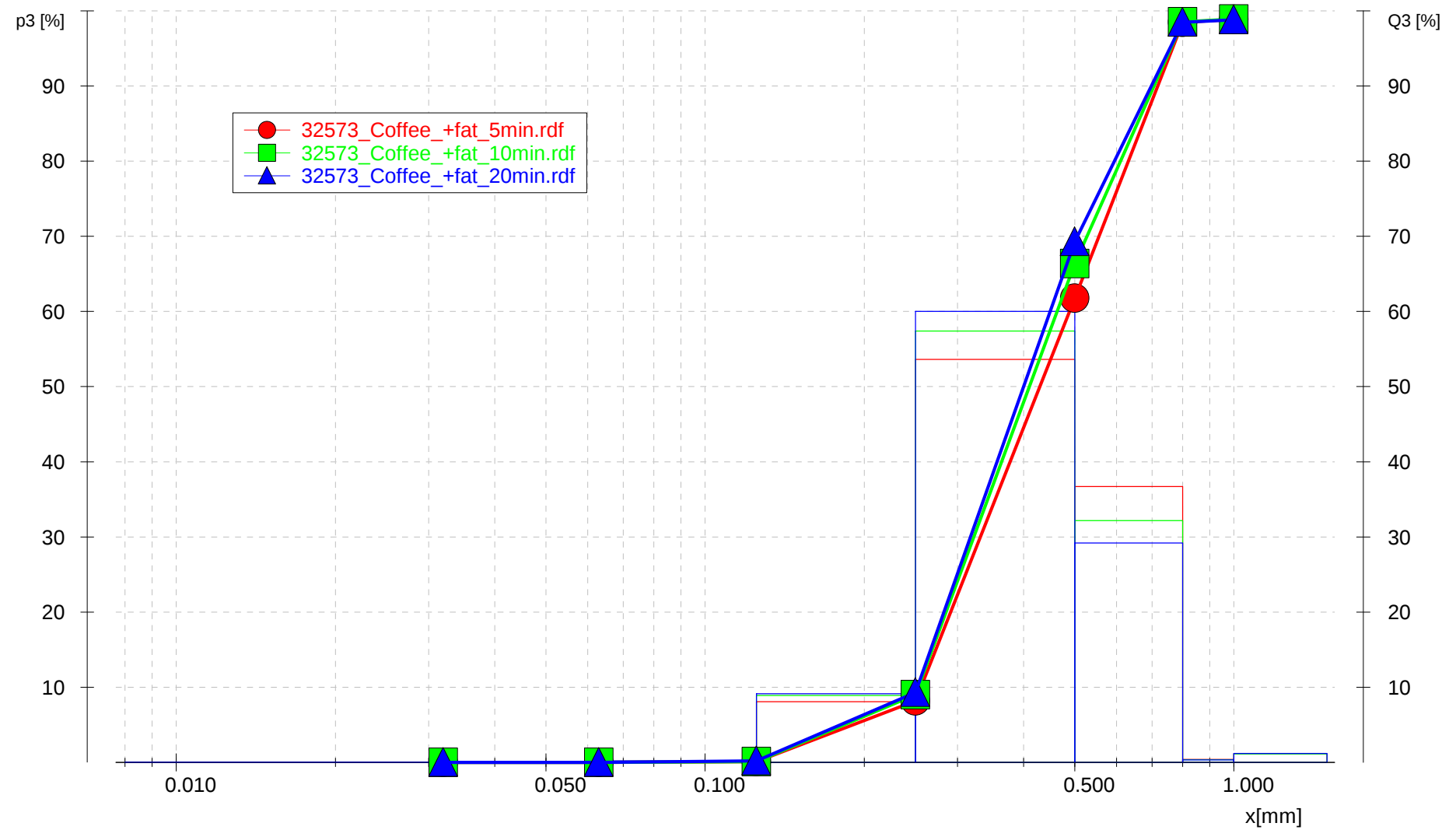
Graph:  
...EVEDAT\32573\_Coffee\32573\_Coffee\_-fat\_5min.rdf (32573\_Coffee.afg)

Degreased coffee, sieved for 5 / 10 and 20 min



Graph:  
...EVEDAT\32573\_Coffee\32573\_Coffee\_+fat\_5min.rdf (32573\_Coffee.afg)

Coffee non-degreased, sieved for 5 / 10 and 20 min



Graph:  
...VEDAT\32573\_Coffee\32573\_Coffee\_-fat\_10min.rdf (32573\_Coffee.afg)

Comparison: Coffee degreased vs. coffee non-degreased

