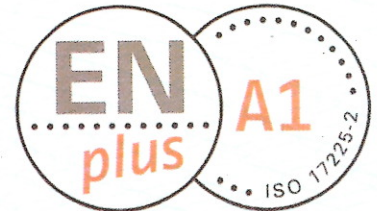




CONTROL UNION



RU 045

CERTIFICATE

Through an inspection at 2019 July 10th we confirm that

Toplivnye Technologii ENplus ID-No.: RU 045

Ostravityanova str. building 1, 391430 Sasovo Ryazan region,
Russia

meets all requirements according to the program of ENplus for:

wood pellet production A1

The certificate holder is a producer and shall be entitled to produce ENplus certified wood pellets. The company is certified by the certification body Control Union Certifications Germany GmbH as an independent third party.

This certificate authorizes the use of the ENplus logo in accordance with the provisions of the valid version of the ENplus handbook.

This certificate is valid from 10.10.2019 to 09.10.2022.

Berlin, 15.10.2019

Place, Date

CUC Germany GmbH
Dorotheastr. 30, D-10318 Berlin
Tel: +49 (0) 30 509 69 88 - 0
Fax: +49 (0) 30 509 69 88 - 88
Stamp, Signature

This certificate is property of the certification body and must be returned on request. The audit based on version 3.0 of the handbook by the European Pellet Council.

Eurofins Umwelt Ost GmbH - Lindenstraße 11
Gewerbegebiet Freiberg Ost - D-09627 - Bobritzsch-Hilbersdorf

Control Union Certifications Germany GmbH
Dorotheastr. 30
10318 Berlin

Title : **Test report for order 11920774**
Test report number : **AR-19-FR-020195-01**

Project name : **Pellets ENplus, Top Tech**

Number of samples : **1**
Sample type : **wood pellets**
Sample Taker: **Client**

Sample reception date : **2019-07-17**
Sample processing time : **2019-07-17 - 2019-08-09**

The test results refer solely to the analysed test specimen. Unless the sampling was done by our laboratory or in our sub-order the responsibility for the correctness of the sampling is disclaimed. This test report is only valid with signature and may only be further published completely and unchanged. Extracts or changes require the authorisation of the EUROFINS UMWELT in each individual case.

Our General Terms & Conditions of Sale (GTCS) are applicable, as far as no specific agreements do exist. The GTCS are available on <http://www.eurofins.de/umwelt/avb.aspx>.

Accredited test laboratory according to DIN EN ISO/IEC 17025:2005 notification under the DAkkS German Accreditation System for Testing. The laboratory is according (D-PL-14081-01-00) accredited.

Dr. Ulrich Erler
Analytical Services Manager
Phone +49 37312076510

Digitally signed 8/9/2019
Dr. Ulrich Erler
Prüfleitung



| Parameter | Lab | Accr. | Method | Limit values | | | | | | Description | | Top Tech - July 2019 | |
|--------------------------------|-----|-------|------------------------------------------|---------------------|--------------|---------------------|--------------|---------------------|-------------|---------------|-------------------|----------------------|-------|
| | | | | ENplus A1 ar | ENplus A1 db | ENplus A2 ar | ENplus A2 db | ENplus B ar | ENplus B db | Sample number | | 119084869 | |
| | | | | | | | | | | LOQ | Unit | ar | db |
| Quality characteristics | | | | | | | | | | | | | |
| Length | FR | JE02 | DIN EN ISO 17829: 2016-03 | 1) | | 1) | | 1) | | | | o.k. | - |
| Diameter | FR | JE02 | DIN EN ISO 17829: 2016-03 | 2) | | 2) | | 2) | | | mm | 6.0 | - |
| Moisture | FR | JE02 | DIN EN ISO 18134-2: 2017-05 | 10 | | 10 | | 10 | | 0.1 | % (w/w) | 7.4 | - |
| Ash content (550°C) | FR | JE02 | DIN EN ISO 18122: 2016-03 | | 0.7 | | 1.2 | | 2 | 0.1 | % (w/w) | 0.5 | 0.5 |
| Durability | FR | JE02 | DIN EN ISO 17831-1: 2016-05 | ≥ 98 | | ≥ 97.5 | | ≥ 97.5 | | | % (w/w) | 98.7 | - |
| Fine portion < 3,15 mm | FR | JE02 | DIN EN ISO 18846: 2016-12 | 1 ³⁾ | | 1 ³⁾ | | 1 ³⁾ | | 0.1 | % (w/w) | 0.1 | - |
| Bulk density | FR | JE02 | DIN EN ISO 17828: 2016-05 | 600 - 750 | | 600 - 750 | | 600 - 750 | | | kg/m ³ | 628 | - |
| Gross calorific value (qV,gr) | FR | JE02 | DIN EN ISO 18125: 2017-08 | | | | | | | 200 | kJ/kg | 18400 | 19900 |
| Net calorific value (qp,net) | FR | JE02 | berechnet nach DIN EN ISO 18125: 2017-08 | ≥ 4.6 ⁴⁾ | | ≥ 4.6 ⁴⁾ | | ≥ 4.6 ⁴⁾ | | 0.06 | kWh/kg | 4.73 | 5.16 |
| Carbon | FR | JE02 | DIN EN ISO 16948: 2015-09 | | | | | | | 0.2 | % (w/w) | 46.2 | 49.9 |
| Nitrogen | FR | JE02 | DIN EN ISO 16948: 2015-09 | | 0.3 | | 0.5 | | 1 | 0.05 | % (w/w) | 0.07 | 0.08 |
| Hydrogen | FR | JE02 | DIN EN ISO 16948: 2015-09 | | | | | | | 0.1 | % (w/w) | 5.7 | 6.1 |
| Oxygen | FR | JE02 | DIN EN ISO 16993: 2016-11 | | | | | | | | % (w/w) | 40.2 | 43.4 |
| Sulphur | FR | JE02 | DIN EN ISO 16994: 2016-12 | | 0.04 | | 0.05 | | 0.05 | 0.005 | % (w/w) | 0.008 | 0.008 |
| Chlorine | FR | JE02 | DIN EN ISO 16994: 2016-12 | | 0.02 | | 0.02 | | 0.03 | 0.005 | % (w/w) | 0.015 | 0.016 |

Trace elements acc. to DIN EN ISO 16968: 2015-09

| Parameter | Lab | Accr. | Method | Limit values | | | | | | Description | | Top Tech - July 2019 | |
|---------------|-----|-------|----------------------------|--------------|--------------|--------------|--------------|-------------|-------------|---------------|-------|----------------------|--------|
| | | | | ENplus A1 ar | ENplus A1 db | ENplus A2 ar | ENplus A2 db | ENplus B ar | ENplus B db | Sample number | | 119084869 | |
| | | | | | | | | | | LOQ | Unit | ar | db |
| Arsenic (As) | FR | JE02 | DIN EN ISO 17294-2:2017-01 | | 1 | | 1 | | 1 | 0.8 | mg/kg | - | < 0.8 |
| Lead (Pb) | FR | JE02 | DIN EN ISO 17294-2:2017-01 | | 10 | | 10 | | 10 | 2 | mg/kg | - | < 2 |
| Cadmium (Cd) | FR | JE02 | DIN EN ISO 17294-2:2017-01 | | 0.5 | | 0.5 | | 0.5 | 0.2 | mg/kg | - | < 0.2 |
| Chromium (Cr) | FR | JE02 | DIN EN ISO 17294-2:2017-01 | | 10 | | 10 | | 10 | 1 | mg/kg | - | < 1 |
| Copper (Cu) | FR | JE02 | DIN EN ISO 17294-2:2017-01 | | 10 | | 10 | | 10 | 1 | mg/kg | - | < 1 |
| Nickel (Ni) | FR | JE02 | DIN EN ISO 17294-2:2017-01 | | 10 | | 10 | | 10 | 1 | mg/kg | - | < 1 |
| Mercury (Hg) | FR | JE02 | DIN EN ISO 12846:2012-08 | | 0.1 | | 0.1 | | 0.1 | 0.05 | mg/kg | - | < 0.05 |
| Zinc (Zn) | FR | JE02 | DIN EN ISO 17294-2:2017-01 | | 100 | | 100 | | 100 | 1 | mg/kg | - | 27 |

Ash melting behaviour (ox. atmo.) 815°C

| | | | | | | | | | | | | | |
|--------------------------|----|------|------------------------|--|--------|--|--------|--|--------|--|----|---|-------|
| Shrinkage start temp SST | FR | JE02 | CEN/TS 15370-1:2006-12 | | 5) | | 5) | | 5) | | °C | - | 1090 |
| Deformation temp DT | FR | JE02 | CEN/TS 15370-1:2006-12 | | ≥ 1200 | | ≥ 1100 | | ≥ 1100 | | °C | - | 1440 |
| Hemisphere temp HT | FR | JE02 | CEN/TS 15370-1:2006-12 | | 5) | | 5) | | 5) | | °C | - | 1460* |
| Flow temp FT | FR | JE02 | CEN/TS 15370-1:2006-12 | | 5) | | 5) | | 5) | | °C | - | 1470 |

Explanations

LOQ - Limit of quantification

ar - as received

db - dry basis

Lab - Abbreviation of the performing laboratory

Accr. - Abbreviation of the accreditation of the performing laboratory

* - no definite hemisphere (hill-like form)

The parameters identified by FR have been performed by the laboratory Eurofins Umwelt Ost GmbH (Bobritzsch-Hilbersdorf). The accreditation code JE02 identifies the parameters accredited according to DIN EN ISO/IEC 17025:2005 D-PL-14081-01-00 .

Explanations regarding Limits

Analysis performed according to EN plus (wood pellets) - edition August 2015.

- 1) 3,15 - 40 mm; up to 1 % of pellets can be longer than 40mm. Maximum length should be <45mm.
- 2) D06 or D08 pellets +/- 1mm
- 3) at the end of production or by loading vehicles for delivery to the customer ($\leq 0,5$ for filling in pellet bags or big bags)
- 4) qp,net: net calorific value at constant pressure
- 5) should be given

EUROFINS UMWELT assumes no responsibility for the legal liability of the cited limits.