



# PERFORMANCE GUARANTEES

**TCG Global, LLC**

**June 19 2020**

**TCG PO RRB120-0001**

**Plug Screw Feeder**

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Valmet (the Seller) will work in close co-operation with TCG Global, LLC (the Buyer) and Red Rock Biofuels, LLC (the User) to attain all guaranteed items.

## 1 DEFINITIONS

**Feed System:** is defined as all wood feed equipment supplied by the Seller in connection with this contract and engineered, installed, and started up according to Seller’s direction and supervision.

**Production Capacity:** is the design flow rate that the feed system is capable of feeding over an extended period of time under the specified conditions contained in this document taking into account short stoppages due to interrupted feed etc and plug screw wear. This is the basis for the performance guarantee run described in Section 5.

**Start Up Date:** The start up date shall be defined as the date on which all equipment included in the delivery has been checked out and has been brought to good operating conditions. The equipment shall be deemed to achieve good operating conditions when the feed system has operated continuously without downtime caused by mechanical failure or necessity for repairs or adjustment for a period of 24 hours.

## 2 Mechanical Warranty

The mechanical warranty period is covered under the general terms and conditions included in this contract.

## 3 Production Guarantees

### 3.1 Feed System Capacity

The guaranteed production capacity of the feed system is as follows:

Item	Unit	Value
Chip supply and chip feed design flow rate	bdst/d	530
Maximum initial volume	m3 per minute	3.00
Maximum Gas Leakage	scfm	10



### 3.2 Definition of Raw Material

Chip bulk density	kg/m <sup>3</sup>	110 or higher
Chip moisture content	%	20 - 48
Particle size distribution		

The raw biomass shall have substantially the same size distribution as the sample tested by Valmet on August 30 2018, The material cannot be fed in a frozen state. The attached specification in Appendix 1 Is a good indication of what is expected as raw material but in the case of a dispute the bucket sample of material used for the testing in Montreal August 30 2018 and kept refrigerated at the Monteval facility will take precedent.

### 3.3 Prerequisites/Input Conditions

#### Process Design Parameters

Maximum Pyrolysis temperature	1,200°F
Maximum Tee- Pipe temperature	600°F
Atmospheric Temperature	Degree -25 - 100°F
Biomass inlet temperature	35 to 200°F (Raw material should not be frozen)

### 3.4 Prerequisites for Utilities

The electric power supply available must correspond to the required voltage and frequency. The supply must be stable during the duration of the Performance Test and shall not vary more than +5/-10% in voltage and ±1% in frequency. This will be the responsibility of the User.

A stable supply of compressed air and steam without disturbing quantities of foreign particles and of specified pressure, temperature and quality must be supplied by the User.



## Steam, air and chemicals

MP-steam	T-Pipe Only
Compressed air	
- Pressure	75 psig*
- Purge gas	Purge gas pressure supply shall be at least 25 psi above the process pressure.**

\* Compressed air shall be of Instrument quality and is required only for the Blow Back Damper and Cut – Off Valve operation. Both are dead end, short cycle (5-10 sec) applications (not continuous flow) and require approximately 10 scfm for a single cycle.

\*\*Purge gas has two applications: Shredder Mechanical Seal – approximately 10 cfm and T-Pipe purge (if no steam is used) – 20 scfm

### **3.5 Feed System Operation**

1. Feed system must feed up to the design flow rate specified in 3.1 above
2. Turn-down of the feed system will be reliable down to 50% of the design flow rate fed from the pre-compression screw during the operation provided a proper variable frequency inverter and motor with adequate cooling is provided by customer on the plug screw feeder.
3. The feed system must be designed to run in a continuous 24 hour 7 day per week service environment.
4. Blow back of process gas must be avoided to the greatest extent possible. Blow backs will be at an absolute minimum as long as the Seller's recommended safety devices are installed and recommended P&ID's and operating and maintenance instructions are followed. If any stoppage occurs for longer than 30 minutes the feed system must be shut down and depressurized.
5. The maximum back flow leakage will be 10 scfm at atmospheric pressure
6. The feed system will break apart the wood plug material before the entrance to the gasifier unit and contain no lumps larger than the infeed stock. The customer will install a VFD on the shredder conveyor for the flexibility to test during the initial operation of the system.
7. Maximum pressure at the tee pipe will be 210 psi @ 800 degrees F. Elastomers in the shaft seals are further limited to 600 degrees F for short periods/intermittent occurrences.

## 4 Prerequisites for Fulfilling Guarantee Values

The warranties and guarantees given in 3.1 are related to the delivery scope that is specified in the technical specification of the contract document. The machinery and processes outside the delivery scope shall not limit the fulfillment of this guarantee or the production of the machine or reliability of the equipment. The production calculation is adjusted for any production losses due to restrictions or occurrences outside of the Seller's scope of delivery.

A sufficient amount of raw material is to be available and must meet the requirements specified in 3.2 for the performance test.

### 4.1 Training

The User must ensure that the plant personnel are well trained.

### 4.2 Prerequisites/Input Conditions.

- A. The equipment must be installed in accordance with the Seller's approved recommendations, drawings, plans, specifications and instructions.
- B. The equipment must be operated and maintained in accordance with the Seller's instructions.
- C. The equipment control system providing analog and digital control for each unit machine must be designed, installed and operated in accordance with the Seller's instructions and recommendations.
- D. The User must provide adequate raw material, power, compressed air, and other utilities as specified by the Seller to operate the Seller's equipment.
- E. The raw material is to be furnished in accordance with the specifications stated in Section 3.2 of this document.
- F. The pre-compression screw and plug screw feeder and all running records, DCS trends, etc. will be accessible to the Seller for inspection upon request.



## 5 Guarantee Value Verification Procedure

### 5.1 Feed System Performance Testing

To prove the guaranteed production capacity and overall operation and safety performance of the feed system, the Buyer will operate the plant under the Seller's supervision and in accordance with the Seller's instructions for a test run of forty (48) hours (herein called the "Performance Test") such that the plant will feed the raw material specified at the guaranteed design flow rate specified in this document in 3.1. During the 48 hour performance test the feed system will be allowed to stop a maximum of three times for a period of not longer than 45 minutes each. The Performance Test is expected to take place three (3) months after startup, and must in the absence of same being delayed for reasons beyond the reasonable control of the Buyer take place no later than six (6) months after startup unless a later date is mutually agreed to by the Buyer and Seller. The Buyer may opt not to run a Performance Test if the plant is performing to guaranteed levels during normal operation. If within 4 months following start up, the Buyer has not notified the Seller in writing of the need to run a Performance Test then the performance guarantees will be deemed to have been met.

A test program will be submitted by the Seller and approved by the Buyer at least one (1) month prior to the proposed date of the Performance Test. Should the Performance Test be interrupted for any reason not related to the equipment being tested, the Performance Test will be resumed after the interruption has ceased and normal operating conditions have been attained. If the interruption, due to causes outside of the Seller's supply, is greater than eight (8) hours, then the Performance Test will be repeated as soon as possible.

If the interruptions continue and are due to causes outside of the Seller's supply, then the Buyer will reschedule the trials at a later date at the Buyer's cost. Testing delays caused by reasons beyond the control of the Seller cannot be delayed beyond 120 days from the original scheduled trial date. If these conditions continue beyond this 120 day period the Seller's performance guarantees will be deemed to have been met.



A Performance Test will be successful if the feed system feeds at least 1000 BDST of the specified raw material into the gasifier unit within the forty eight (48) hour period while meeting the conditions specified in Section 3 of this document.

If any of the performance guarantees have not been met on the basis of the Performance Test, then the Seller, as soon as practical, shall provide technical assistance at the plant to make the necessary recommendations and modifications and shall supply at the plant, at no cost to the Buyer, parts or components of the equipment supplied by the Seller which are necessary to enable the equipment to meet the production and performance guarantees contained in this article. The Seller shall be responsible for the following costs to make these changes including, the equipment and freight. The Seller shall notify the Buyer in writing upon completion of these modifications and a second Performance Test shall be carried out within 30 days of the Seller's notification. Should the guaranteed performance not be met during this second Performance Test, then the Seller shall have a further period not exceeding ninety (90) days from the date of the second Performance Test to correct the equipment at the Seller's sole cost and expense. The Seller will notify the Buyer forthwith upon completion of the corrections and a third Performance Test will be carried out within 30 days of the Seller notification. The test limitation period shall not exceed nine (9) months from the start-up date. If by this time the performance guarantees have not been met, then the pre-agreed remedy can, if both parties agree, be implemented in accordance with Section 7. If any of the performance guarantees have not been met on the basis of the two additional trial efforts, and if both parties agree, then an additional performance test/tests can be done.

If the guarantee test run cannot be started within 6 months from the start up or within 12 months from the last main shipment for reasons attributed to the Buyer, the guarantees and warranties shall be considered fulfilled without any performance guarantee test run.

The Buyer and Seller agree to work in good cooperation in order to attain the guarantee values.

The guaranteed figures specified in Section 3 are to be met during the Performance Test as defined in Section 5 of this document the details of which will be planned jointly by the Buyer and the Seller, both of whom will participate in the guarantee test run.

A sample of the material used during the performance test will be taken and sent to the Valmet St. Laurent, Quebec, Canada Service Center for verification of the raw material meeting the quality specification specified in Section 3.1.



During the preparation phase of the performance test the Buyer and Seller must agree on the method for measuring the feed of the raw material to the feed system.

## 6 Methods of Determining Guarantee Values

### 6.1 Laboratory Procedures

#### **Analysis methods.**

During the performance test, the sampling shall be even and accurate. All testing is to be carried out according to TAPPI standard testing procedure.

## 7 Remedies

If upon the expiration of the test limitation period defined in Section 5 the feed system fails to meet the overall performance guarantee due to reasons attributable to Seller, and if all of the performance prerequisites have been delivered by the Buyer as specified in Section 3, and if the Buyer, Seller, and User agree that all means have been exhausted to remedy any shortfalls, then, as Buyer's sole and exclusive remedies, the following remedies will be implemented.

**Production Rate** – For every ton of production shortfall a 1% reduction in the selling price up to a maximum of 10% of the contract value.

**Gas Leakage** – For every cfm in excess of 10 cfm a 1% reduction in the selling price up to a maximum of 10% of the contract value.

For production rate and gas leakage the reduction is only assessed once and in any case the **maximum aggregate liability** paid by the Seller to the Buyer in liquidated damages is 10% of the contract value. The remedies set forth herein shall be Buyer's sole and exclusive remedies for failure to achieve the performance guarantees. Payment of liquidated damages pursuant to this Section shall discharge Seller from any and all liability out of and/or in connection with the failure to achieve one or more Performance Guarantee.





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