



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

99

April 14, 2014

Mr. Jeremy Rohrbaugh
Rohmac, Inc.
P O Box 335
Mt. Storm, WV 26739

RE: Rhomac Inc. Model 482DR Diesel Powered Scoop utilizing a Rhomac Inc. Model DEC 1202 Exhaust Conditioning System and equipped with a Deutz BF4L-2001 78 hp @ 2800RPM engine (MSHA Part 7 Approval # 07-ENA040004) with a CDTi/ECS, Model AZ-27 diesel oxidation catalyst, and a DCL International Inc. Model 95NC-SA-5UG5-21 DPM filter (85% efficient)

Dear Mr. Rohrbaugh:

Chapter 4 of the "Bituminous Coal Mine Safety Act" (the Act) provides for the use of diesel-powered equipment in underground bituminous coal mines. Section 424 of the act created a Technical Advisory Committee ("TAC") for the purpose of advising the Department regarding implementation of Chapter 4 and evaluation of alternative technology or methods for meeting the requirements of Chapter 4.

On February 28, 2014, Rhomac submitted a request to the TAC and Bureau of Mine Safety to have this piece of equipment inspected. The DEP requested TAC to do so. On March 31, 2014, the TAC and DEP traveled to Mt. Storm, WV to conduct their investigation.

The TAC recommended temporary approval of this equipment in their report of April 1, 2014. Permanent approval was recommended at the TAC meeting on April 9, 2014.

Based on the recommendation of the TAC and the equipment approval staff, your request for approval is granted.

If you have any questions on this request, please contact Joseph Scaffoni at jscaffoni@pa.gov or at 724-439-7469.

Sincerely,

Joseph A. Scaffoni
Director
Bureau of Mine Safety

cc: Bowersox
Borchick

Enclosure(s)

BUREAU OF MINE SAFETY

Fayette County Health Center | 100 New Salem Road, Room 167 | Uniontown, PA 15401

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**Pennsylvania Technical Advisory Committee
On Diesel Powered Equipment**

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April 1, 2014

Joseph Sbaffoni, Director
Bureau of Mine Safety
Fayette County Health Center
100 New Salem Road, Room 167
Uniontown, Pa. 15401

RE: Rhomac Inc. Model 482DR Diesel Powered Scoop utilizing a Rhomac Inc. Model DEC 1202 Exhaust Conditioning System and equipped with a Deutz BF4L-2011 78 HP @ 2800RPM engine (MSHA Part 7 Approval # 07-ENA040004) with a CDTi / ECS, Model AZ-27 diesel oxidation catalyst, and a DCL International Inc. Model 95NC-SA-5UG5-21 DPM filter (85% efficient).

Dear Mr. Sbaffoni:

Chapter 4 of the "Bituminous Coal Mine Safety Act" (the Act) provides for the use of diesel-powered equipment in underground bituminous coal mines. Section 424 of the act created a Technical Advisory Committee ("TAC") for the purpose of advising the Department regarding implementation of Chapter 4 and evaluation of alternative technology or methods for meeting the requirements of Chapter 4.

Background

On February 28, 2014, Rhomac Inc. submitted a request to the TAC and Bureau of Mine Safety for evaluation and approval pursuant to Chapter 4 of the Act for a Rhomac Inc. Model 482DR Diesel Powered Scoop utilizing a Rhomac Inc. Model DEC 1202 Exhaust Conditioning System and equipped with a Deutz BF4L-2011 78 HP @ 2800RPM engine (MSHA Part 7 Approval # 07-ENA040004) with a CDTi / ECS, Model AZ-27 diesel oxidation catalyst, and a DCL International Inc. Model 95NC-SA-5UG5-21 DPM filter (85% efficient).

On March 4, 2014 the Director of BMS requested the TAC to advise the Department whether or not this request meets the requirements of the ACT regarding the exhaust emission and control system.

The diesel power package includes the following items:

- Deutz BF4L-2011 78 HP @ 2800RPM engine (MSHA Part 7 Approval # 07-ENA040004)
- Rhomac Inc. Model DEC 1202 Exhaust Conditioning System
- CDTi / ECS, Model AZ-27 diesel oxidation catalyst
- DCL International Inc. Model 95NC-SA-5UG5-21 DPM filter (85% efficient)

More detailed information on the specifications for the Model 482DR Scoop diesel power package is included on the General Specification Sheet attached. (Attachment1)

Investigation

On March 31, 2014 the TAC and DEP traveled to Rhomac Inc. in Mt. Storm, WV to inspect the equipment when it became available. The TAC evaluated the engine and exhaust emissions package.

Emissions testing of the engine and after-treatment system were performed, as well as exhaust gas temperature monitoring and stall test procedure. The results of the emission tests showed the engine was performing within MSHA's approval specifications.

Monitoring of the exhaust gas temperature produced a high exhaust gas temperature reading of 260° F, which is well below the 302° F allowed by Section 403 (b)(4) of the Act. The maximum surface temperature observed was 280° F on the exhaust manifold after conducting all CO testing. The maximum engine oil temperature was 190° F. The results of the smoke dot test were#2.

The after-treatment system is fitted with a DCL International Inc. Model 95NC-SA-5UG5-21 DPM filter (85% efficient). The results of the engine and filter extrapolations show that the diesel power package will result in an average ambient concentration of .0544 mg/m³ of diesel particulate matter when diluted by 100% of the MSHA approval plate ventilation rate for this engine, which is well below the .12 mg/m³ requirement of Section 403 (a)(1) the Act. (Attachment 2)

In addition to the testing that was conducted, our investigation and our observations confirmed that the diesel power package is capable of meeting all the requirements of Section 403 of the Act.

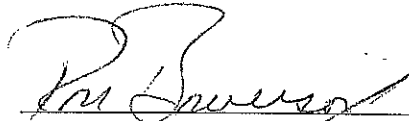
Recommendation

Our recommendation is based upon the data supplied by Rhomac, Inc., the results of the tests conducted on March 31, 2014, as well as the data acquired and observations made during our investigation. The TAC has determined that Model 482DR Diesel Powered Scoop utilizing a Rhomac Inc. Model DEC 1202 Exhaust Conditioning System and equipped with a Deutz BF4L-2011 78 HP @ 2800RPM engine (MSHA Part 7 Approval # 07-ENA040004) with a CDTi / ECS, Model AZ-27 diesel oxidation catalyst, and a DCL International Inc. Model 95NC-SA-5UG5-21 DPM filter meets all requirements of Section 403 of Chapter 4 of the Pennsylvania Bituminous Coal Mine Safety Act. As such, we are recommending approval of the above described diesel power package. This recommendation is provided with the understanding that the General Specification Sheet (Attachment 1) be strictly adhered to.

Should the Director receive a request for temporary approval for use prior to the next TAC meeting, the TAC will recommend temporary approval until the next scheduled TAC meeting on April 9, 2014 at which time permanent approval will be recommended.



Paul Borchick



Ron Bowersox

General Specification Sheet

EQUIPMENT MANUFACTURER ROSEBUD MINING COMPANY MODEL 482 D R DATE 02/28/14

I. Engine			
Manufacturer	Deutz	Particulate Index (PI)	2500
Manufacturer Address	3883 Steve Reynolds Blvd Norcross, GA 30093		
Engine Model No.	BF4L2011	Gaseous Ventilation Rate (CFM)	6000
Engine Serial No.	TBD	Raw DPM (gr/hr)	3.7
HP/RPM (rated)	78 / 2800	MSHA Part 7 Approval #	07-ENA040004
Low Idle (RPM)	900	MSHA Part 7 Ventilation Rate (CFM)	6000
Max. Dirty Intake Air Restriction H ² O	26	Type of Aspiration	Turbocharged
Max. Allowed Backpressure H ² O	30	Turbocharger Boost (psi)	11.6-15.9
High Idle (RPM)	3150	Fuel Delivery System	Direct Injection
Water-jacketed components	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Engine Cooling via	Integrated Oil Cooler
II. Particulate Filter			
Manufacturer	DCL International Inc.		
Manufacturer Address	2 41 Bradwick Dr. Concord ON L4K 1K5 Canada		
Model Number	95NC-SA-5UG5-21	System Type	Ceramic
MSHA Efficiency Rating	85	MSHA Approved	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Treated DPM mg/m ³ when diluted w/100% Part 7 ventilation rate <i>(show calc on separate sheet)</i>	0.0544		
III. Catalyst			
Manufacturer	CDTI / ECS		
Manufacturer Address	CDTi - 83 Commerce Valley Drive East, Thornhill, Ontario L3T 7T3 CANADA		
System Name	A-Z Severe Duty		
Model Number	AZ-27		
IV. Flame Arrestor			
Manufacturer	Controls & Instrumentation Company, Inc.		
Manufacturer Address	7950 West Winds Blvd., Concord, NC 28027		
System Name	CIC		
Model Number	804/D-IL-C4C	MESG	Group D Vapor Service
V. Heat Exchanger			
Manufacturer	ROHMAC INC	Model or Part #	DEC 1202
VI. Fire Suppression System			
Manufacturer	ANSUL	Model or Part #	Checkfire SCN

ATTACHMENT 1

DPM Calculation Sheet

Engine Deutz BF4L2011
 MSHA Approval 07-ENA040004
 Ventilation Rate 6000 cfm
 DPM Emissions 3.7 g/hr
 Filter Type DCL MINE-X Sootfilter Ceramic
 Filter Efficiency 85 %

DPM Unit Conversion

$$\begin{array}{rcl}
 \text{g/hr} & & \text{mg/g} \\
 3.7 & \times & 1000 \\
 \hline
 & & \text{BT} \\
 & & = 61.667 \text{ mg/min}
 \end{array}$$

Ventilation Rate Unit Conversion

$$\begin{array}{rcl}
 \text{cfm} & & \text{m}^3/\text{min} \\
 6000 & \times & 0.0283 \\
 & & = 169.89 \text{ m}^3/\text{min}
 \end{array}$$

Filtered DPM Emissions Calculation

$$\begin{array}{rcl}
 \text{mg/min} & & \text{min/m}^3 & & \text{filter eff} \\
 61.667 & \times & 1 & \times & 15 \\
 \hline
 & & 169.89 & & 100 \\
 & & & & = 0.0544 \text{ mg/m}^3
 \end{array}$$