CLEAN AIR AMERICA, INC

ENGINEERING CLEAN AIR SOLUTIONS

March 14, 2005

Mr. Nathan McCall
Robert Bosch Corporation
Automotive Group
8101 Dorchester Road
Charleston, SC 29418

Project Description: EV14 Line # 3 (Serial Line # 6) Laserweld exhaust vacuum system & Alternative for combining Line # 3 and Line # 2 into a common vacuum system

Dear Nathan:

I appreciate the opportunity to provide clean air to Bosch Corporation. After carefully analyzing your application, I am please to provide the following proposal.

The process at Bosch's facility consists of laser welding of stainless steel parts for the manufacturing of anti lock brake, fuel systems and pump parts for cars. Clean Air America understands the process and the requirements to successfully capture the smoke that is generated. The solution we recommend has a small collector footprint and requires minimal maintenance for the equipment to work properly.

APPLICATION:

The application consists of laser welding. The welding smoke is a nuisance and requires a system that is capable of collecting the smoke and having a large enough filter area and efficiency to clean the air of the finer particles associated with stainless steel laser welding.

I have included 2 alternatives on this project. One calls for combining line 2 and the new line 3 into one common central vacuum system. This would replace the current DFC 4 in the location where it is installed currently. The other alternative is for a unit designed for the flow needed at the new line 3.

Our recommendations:

Alternative # 1

1. Install a DFC 18 cartridge collector with a 20 HP 20" (70%) blower wheel, capable of 6,000 cfm @ 7-8" external static pressure (Total static pressure for system is 14"). This system uses a true down flow principle. This system will give you the lowest PM cost in the long

run because it has a larger filter area, and the filters will be cleaned by a reverse pulse system. The filter selection for these systems will be cellulose filters.

2. Install an after filter module containing (2) 24" x 24" x 12" HEPA filters to remove the extremely fine particles that is associated with laser welding and, specially, since this is welding of stainless steel parts.
3. Install Clamp together type ducting to move the smoke from the stations to the collector. Each pick up point will move 150 cfm through 3" ducting. There are a total of 21 (capacity on unit is for 25) on the new line and 15 on the line 2 stations to capture from. We will transport the smoke at a minimum of 3,500-fpm. This is necessary to minimize build up in the ducting.
4. The collector will be installed inside the building. Location will be where Line # 2's DFC 4 is currently
5. I strongly recommend a variable frequency drive on this central vacuum system. We spoke about this at our meeting and everyone agreed it would benefit Bosch in the fact that the utility cost would be lower, filter lifetime would increase and noise levels would be lowered at least for the majority of the running time since the rpm of the motor is controlled.
6. We would install dampers and "bleed in points" at each pick up point on the new line. We would leave the old line alone for now.
7. We would change the main duct from the last pick up point on Line # 2 since we need more flow to lead to the new central vacuum system (DFC 18).

Alternative # 2

1. Install a DFC 8 cartridge collector with a 15 HP 20" (44%) blower wheel, capable of 3,750 cfm @ 7-8" external static pressure (Total static pressure for system is 14"). This system uses a true down flow principle. This system will give you the lowest PM cost in the long run because it has a larger filter area, and the filters will be cleaned by a reverse pulse system. The filter selection for these systems will be cellulose filters.
2. Install an after filter module containing (2) 24" x 24" x 12" HEPA filters to remove the extremely fine particles that is associated with laser welding and, specially, since this is welding of stainless steel parts. You can only move 3,000 cfm maximum through a 24" x 24" x 12" filter therefore the need for a larger after filter module
3. Install Clamp together type ducting to move the smoke from the stations to the collector. Each pick up point will move 150 cfm through 3" ducting. There are a total of 21 stations (we have designed the flow for a total of 25 stations) on the new line to capture from. We will transport the smoke at a minimum of 3,500-fpm. This is necessary to minimize build up in the ducting.
4. The collector will be installed inside the building. Location will be at the end of the line according to the drawing supplied to us.
5. I strongly recommend a variable frequency drive on this central vacuum system. We spoke about this at our meeting and everyone agreed it would benefit Bosch in the fact that the utility cost would be lower, filter lifetime would increase and noise levels would

be lowered at least for the majority of the running time since the rpm of the motor is controlled.

6. We would install dampers and "bleed in points" at each pick up point on the new line. We would leave the old line alone for now.

Design Philosophy:

Cartridge Collector DFC 8 and DFC 18

The system is designed to maximize performance and filter lifetime so your PM will be as low as possible. The Down-Flow Cartridge Collector achieves this in a number of ways.

- *Down-Flow principle*. The air enters at the top of the system, forming a laminar flow, moving downwards with gravity through the filters, which are vertically positioned for optimum performance. The collector has a large internal area to slow down the air movement inside the unit. This causes the large dust particles to go straight down into the hopper.
- *Large Filter Area*. We will use cellulose filters for this application. The DFC 8 has 1,760-sq. ft. and the DFC 18 has 3,960 sq. ft of active filter area. We will use 100% of the filter because we have vertically positioned filters. Other systems have horizontally positioned filters, which means the top third never get cleaned properly because the dust just falls back down.
- *Blower package*. We use backward incline blower wheels and TEFC energy efficient motors to ensure performance even when the filters are getting dirty. Also, the TEFC energy efficient motors that we use don't require any maintenance unlike other motors.
- The system has an electrical package, that consists of a motor starter, disconnect, located on the unit along with a pulse on demand controller. This controller has a differential pressure sensor. Therefore, when the specific pressure is achieved, the controller sends a signal to the valve. As a result, a burst of compressed air is sent through a specially made nozzle underneath each filter ensuring the best cleaning system available today. The controller will also do what is called a shut down cleaning cycle, which means the controller will send a number of pulses to clean the filters when the blower is shut off.

The components are in a very sturdy cabinet that will handle many years of use in an industrial environment. Clean Air America, Inc. offers a two-year product guarantee that covers all parts except consumables, i.e., filters.

Clean Air America agrees to conform to Bosch's General Delivery Specifications for machinery and equipment.

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Maintenance:
Please be aware, proper maintenance of collectors and changing the filters periodically reduces the risk of fires in collectors.

Compressed air is an expensive commodity. We have selected our pulse on demand controller so compressed air is only used when the equipment is cleaning the filters. This is the best way of saving compressed air while still doing a very good job of cleaning the filters.

Performance Guarantee:
Clean Air America, Inc. is very confident in engineering a solution that will work well for Robert Bosch Corporation. We guarantee that our equipment will work as specified and draw the air borne dust and smoke into the clean air device, and that with proper filter application and maintenance that the clean air can be returned to the plant environment. We have such confidence that Clean Air America, Inc. provides a performance guarantee on systems when we engineer solutions and provide turnkey installation.

Please give me a call if you have any questions.

Sincerely,

Jorgen Brahm
Consultant

PRICING

Quote # 04327

PROJECT DESCRIPTION: EV14 SERIAL LINE 6 & SERIAL LINE 3 (Line # 3 and Line # 2) LASERWELD EXHAUST VACUUM SYSTEM **RFQ 05-2985HM**

PROJECT ENGINEER: NATHAN MCCALL

WE PROPOSE THE FOLLOWING COMMON VACUUM SYSTEM TO BOSCH CORPORATION FOR YOUR 25 PICK UP POINTS ON LINE # 3 AND 15 ON LINE # 2

1	Clean Air America DFC 18 Down Flow Filter Cartridge Collector with dust tray, blower kit 20 HP 20" 70% Class 4 blower wheel capable of 6,000 cfm @ 8" external static pressure. Electrical package: contains motor starter, transformer, disconnect switch, controller for pulse on demand, start & stop push buttons installed on unit. Filter kit consists of 18 flame retardant cellulose filters (220 sq. ft. each. Total of 3,960 sq. ft. of filter media)	
SUBTOTAL		Part # TBA

Optional

1	After filter module with (2) HEPA filters	Part # TBA
1	Motor drive (VFD) variable frequency drive	Part # TBA
1	Remote start stop switch	Part # 8105
	Ducting Type Clamp together from the stations to the collector	
	Installation	

TOTAL

This would mean that a common collector serves Serial Lines # 3 & 6. This would also allow for the current DFC 4 to be relocated and used on other applications (Please consult Clean Air America, Inc. for relocating this unit.

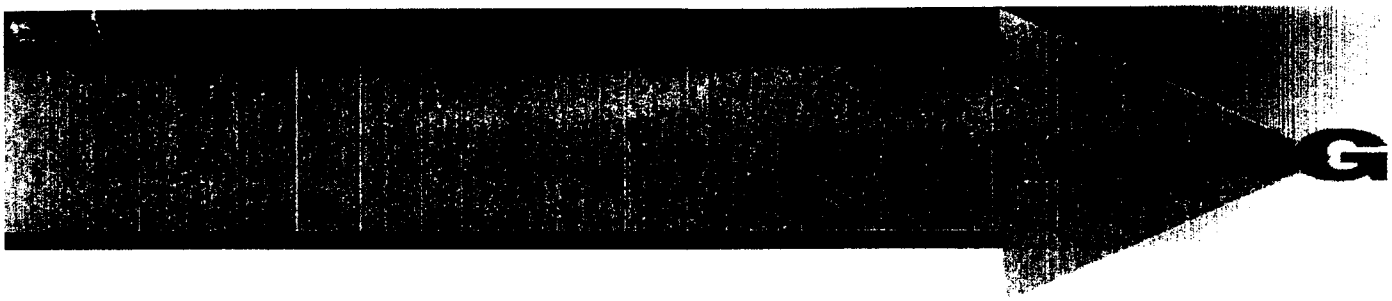
Warranty is for two years and covers everything except consumables, i.e. filters.
Prices hold good for 60 days
Terms FOB Rome, GA
Lead Time: 10 weeks after receipt of order
Payment terms: **30% with order**
50% at delivery
20% net 30 days

Prices do not include electrical or compressed air hook ups or any applicable taxes. Price does not include forklift or manlift rental if required for installation. We agree to conform to Bosch's General Delivery Specifications for machinery and equipment.

For and on behalf of Clean Air America, Inc.

Jorgen Brahm
March 14, 2005

Proposal Nathan:
Laserweld exhaust Vacuum unit DFC 18 from Clean Air
like SL6
→ but with none of the quoted options
→ Company Cubum make the installation of the headers



Quote # 04328

PROJECT DESCRIPTION: EV14 SERIAL LINE 6 (Line # 3) LASERWELD EXHAUST VACUUM SYSTEM

PROJECT ENGINEER: NATHAN MCCALL

WE PROPOSE THE FOLLOWING SYSTEM TO BOSCH CORPORATION FOR YOUR 25 PICK UP POINTS ONTHIS PROJECT **RFQ 05-2985HM**

1	Clean Air America DFC 8 Down Flow Filter Cartridge Collector with dust tray, blower kit 15 HP 20" 44% Class 4 blower wheel capable of 3,750 cfm @ 8" external static pressure. Electrical package: contains motor starter, transformer, disconnect switch, controller for pulse on demand, start & stop push buttons installed on unit. Filter kit consists of 8 flame retardant cellulose filters (220 sq. ft. each. Total of 1,760 sq. ft. of filter media)	
SUBTOTAL		Part # TBA
Optional		
1	After filter module with (2) HEPA filters	Part # TBA
1	Motor drive (VFD) variable frequency drive	Part # TBA
1	Remote start stop switch	Part # 8105
	Ducting Type Clamp together from the stations to the collector	
	Installation	
TOTAL		

Warranty is for two years and covers everything except consumables, i.e. filters.
Prices hold good for 60 days
Terms FOB Rome, GA
Lead Time: 10 weeks after receipt of purchase order
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Prices do not include electrical or compressed air hook ups or any applicable taxes. Price does not include forklift or manlift rental if required for installation. We agree to conform to Bosch's General Delivery Specifications for machinery and equipment.

For and on behalf of Clean Air America, Inc.

Jorgen Brahm
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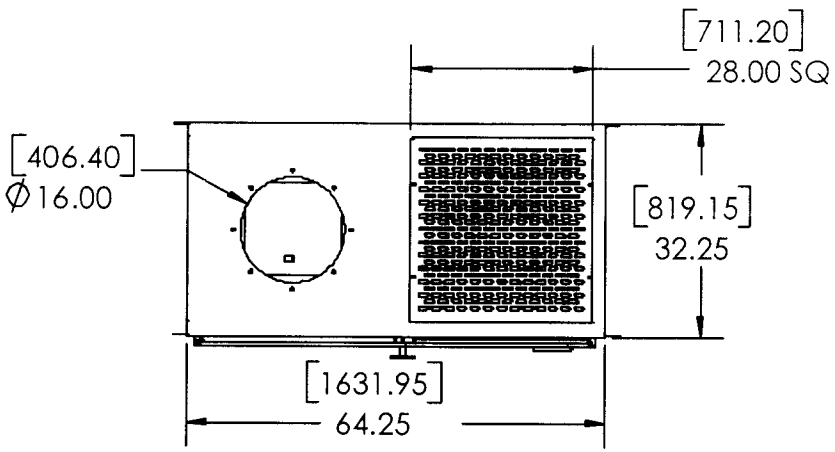
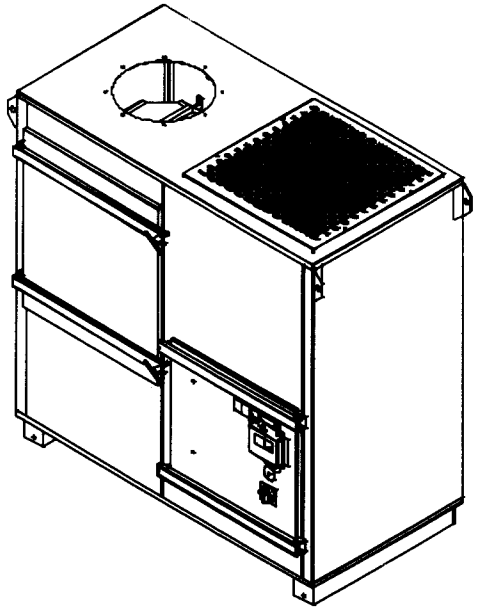
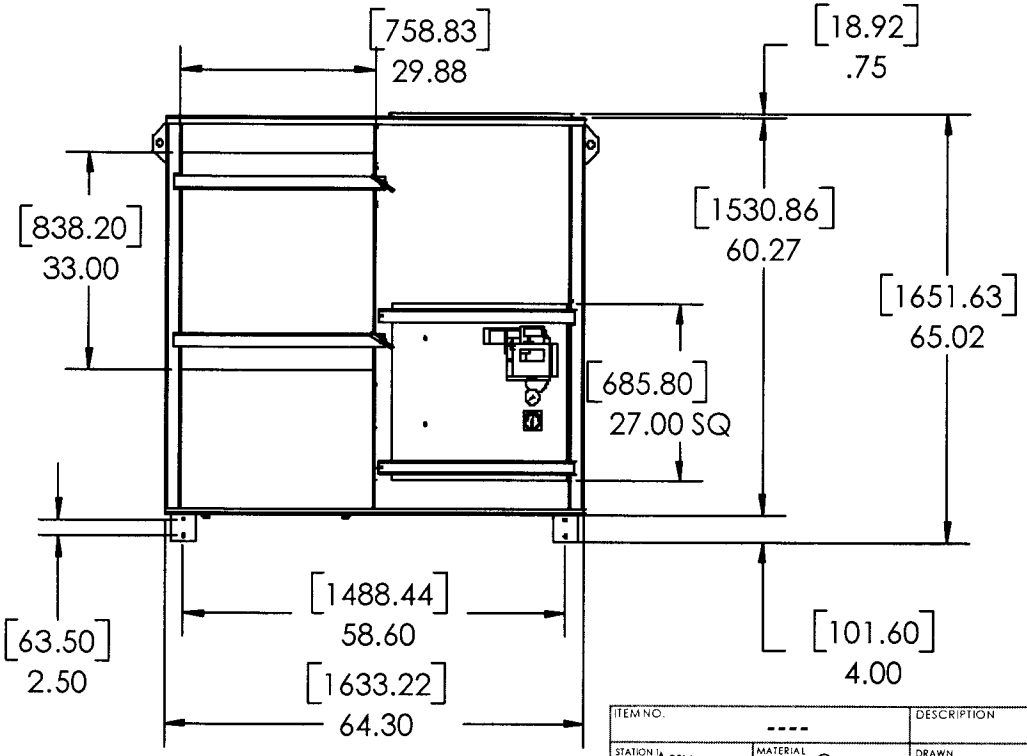
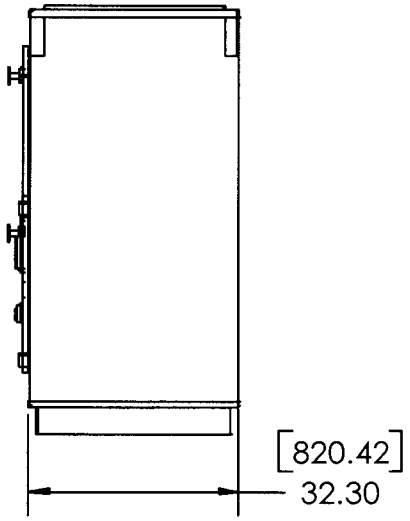


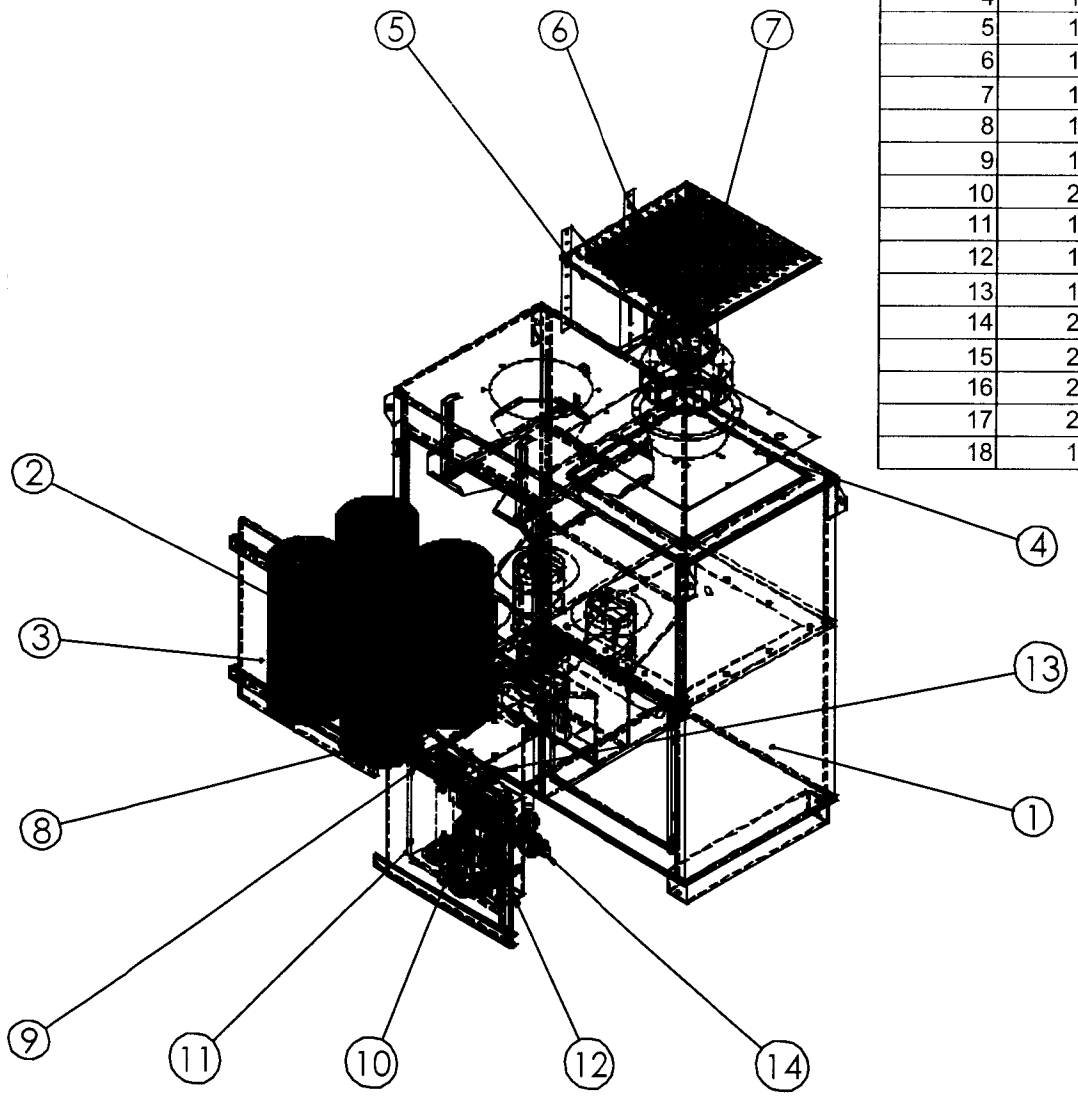






ITEM NO. ----		DESCRIPTION **DFC 4**				QTY per BUILD 1
STATION 1 Assy	MATERIAL -- Gage	DRAWN VladaZ	February 10, 2002 6:30:45 PM	SIZE A	UNLESS OTHERWISE SPECIFIED: ALL BENDS ARE 90° DIMENSIONS ARE IN: MILLIMETERS AND INCHES TOLERANCES ARE: FRACTIONS ±1/32 DECIMALS .XX ±.03 .XXX ±.015 ANGLES .X ±1°	CLEAN AIR AMERICA, INC
STATION 2 ----	SIZE -- X --	REVISED VladaZ	April 21, 2004 11:51:08 AM	REVISION 001		
STATION 3 ----	WEIGHT ----	CHECKED ----	----	SCALE 1:28	CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE. DO NOT SCALE DRAWING.	
STATION 4 ----	CAD FILE: DFC 4 3-Views, Exploded		SHEET: 1 OF 2			

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	7250	DFC 4 Weldment
2	4	----	Filter 26"
3	1	7306	DFC 4 Filter Door Assy
4	1	----	WS2000-DFC Inlet Cone Plate
5	1	----	DFC Motor Mount
6	1	----	Motor/Blower Inlet Cone Assy
7	1	7052	DFC Exhaust Panel, 28x28
8	1	7809	WS2000 DFC 4-8-12-18-24 Reservior Holder Assembly
9	1	7800	WS2000-DFC 4-8-12 Reservoir Assy
10	2	7802	Resevoir Holder Starp for 6in Pipe
11	1	7042	DFC Electrical Door Assembly STD
12	1	----	Electrical Box Assembly
13	1	1234	Air Sensor- MecAir
14	2	1072	Reservoir Valve for 1.5" Pipe
15	2	7969	DFC Door T-Handle
16	2	8803	DFC 4 Clamp Channel
17	2	8646	DFC Clamp Angle Hinge
18	1	8571	DFC 12 Filter Clamp Panel Assy



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STATION 3 ----	WEIGHT ----	CHECKED ----	----	SCALE 1:28	CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE. DO NOT SCALE DRAWING.
STATION 4 ----	CAD FILE: DFC 4 3-Views, Exploded		SHEET: 2 OF 2		CLEAN AIR AMERICA, INC