North Carolina Department of Environment and Natural Resources
Division of Waste Management
Dexter R. Matthews
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

December 20, 2012

Mr. John A. Sabatini
Assistant Vice President, Engineering
Universal Leaf North America US, Inc.
3174 Boddie Mill Pond Road
PO Box 519
Nashville, North Carolina 27549

Solid Waste Compost Demonstration Approval (SWCD-64-01)

Dear Mr. Sabatini:

The Division of Waste Management, Solid Waste Section, has reviewed your request for approval of a Solid Waste Composting Demonstration (SWCD-64-01) located on Boddie Mill Pond Road in Nashville, NC. Your request is considered approved in accordance with the N.C. Solid Waste Management Rules, 15A NCAC 13B .1409 and subject to the following conditions:

(1) The approval period is from receipt of this letter to December 14, 2013. If an extension is needed it must be requested by September 14, 2013 with a justification for the extension.

(2) A full Solid Waste Compost facility permit will not be issued for this facility without approval from the appropriate local zoning officials or a letter indicating that the property is not zoned. Any local zoning approvals necessary for the demonstration approval are the responsibility of the applicant.

(3) Composting at this site shall be limited to the materials specified in the application.

(4) The site shall be prepared to control run-off and run-on. Best management practices shall be utilized for this purpose. All run-off from the site and any leachate generated shall be managed to prevent any impact to ground or surface waters. A full Solid Waste Compost facility permit will not be issued for this facility until storm water and leachate from the site are managed according to the Division of Water Quality's standards.

(5) This approval is subject to immediate revocation if activities on site result in a direct or potential threat to the public health or the environment or if significant odor problems are created. The Division of Waste Management reserves the right to apply any other requirements of 15A NCAC 13B Section .1400 as the Division deems necessary during the above approval period.

(6) Operation of the facility and compost monitoring activities shall be in accordance with the approved application and Section .1406 of the Solid Waste Management Rules. Records of temperatures shall be maintained to show pathogen reduction and vector attraction reduction requirements have been met and shall be available to representatives of the Section upon request.

(7) Compost testing, frequency of testing, and reporting of test results shall be in accordance with the approved application and Section .1408 of the Solid Waste Management Rules. Classification and distribution of compost shall be in accordance with Section .1407 of the Solid Waste Management Rules.

(8) **All compost shall be tested and the results approved by the Solid Waste Section prior to being used at the facility or removed from the facility for any use.**

(9) Any changes or additions to this facility, subsequent to receipt of this letter shall be approved prior to the start of the operation.

(10) This approval is not transferable.

If you have questions concerning this approval please contact Tony Gallagher at (919) 707-8280.

Sincerely,

Michael Scott, Section Chief
Solid Waste Section

cc: Dennis Shackelford, Western District Supervisor
Ben Barnes, Environmental Senior Specialist

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Universal Leaf North America U.S., Inc.

NASH FACILITY
P.O. BOX 519
Nashville, NC 27856
Phone (252) 462-4300

Mr. Tony Gallagher
Solid Waste Section
NCDENR – DWM
217 Jones St.
1646 Mail Delivery Center
Raleigh, NC 27699-1646

11/28/12

Dear Mr. Gallagher;

Subject: Solid Waste Composting at Universal Leaf North America, Inc. (ULNA).

I am responsible for conducting the required activities related to composting solid waste and fully agree with the recommendations of Dr. Rubin.

Please find attached our permit application with corrections (Rev.1). The application has been compiled with the help of Dr. A.R. Rubin. I hope you find all of the necessary information within the report. If you have any questions of comments, please feel free to reach me through the contact information below.

The following attachments are included:

1. Letter for Dr. Rubin to me.
2. Application.
3. Permit Application attachment regarding equipment.
4. Map.

Best Regards,

John A. Sabatini

John A. Sabatini
Assistant Vice President, Engineering
Universal Leaf North America US, Inc.
3174 Boddie Mill Pond Road
PO Box 519
Nashville, NC 27549
(w) 252-462-4334
(e) sabatij1@universalleaf.com

Memo From: A. R. Rubin
Subject: Compost process for ULNA by-products
To: John Sabatini and ULNA Management

The ULNA processing facility near Nashville, NC has been permitted to apply vegetative waste generated at the facility onto land adjacent to the plant. The by-product is an excellent source of plant nutrients and the land treatment operation has been successful, but not without significant effort. Recent soil and site testing suggest levels of phosphorus and potassium are accumulating in the soil resources on the site. This may create a nutrient issue in the future as the USDA Phosphorus Loss Assessment Tool (PLAT) requirements are imposed on agricultural and agribusiness waste management activities. Composting the waste or by-product offers a viable option for managing the material, reducing cost associated with the land treatment operation, and potentially producing a marketable product from the waste leaf, dust, and stem.

The cost of a compost demonstration permit from the NC Division of Waste Management is zero dollars. That does not imply that the cost is zero, the compost must be generated, records must be maintained, and a report must be submitted documenting the compost process.

History indicates that the compost process results in a 25% to 30% reduction in volume applied to land, Organic carbon is lost from the material and some of the nutrients are lost to the atmosphere. The process will result in some loss of ammonia nitrogen. Some phosphorus loss will result from incorporation of organic P into organisms and the testing will show some reduced P. Both the volume loss and some of the nutrient loss will result in reduction of expense associated with the land application; but there will be cost for compost production. I believe the compost production cost may be less than the land application cost.

A further benefit for the compost process includes the opportunity to eliminate transport of all the vegetative waste from the ULNA facility to the landfill. Cost for landfilling will increase. Based on review of records, 1800 tons could be diverted from the landfill. The 1800 tons include the Burley organics and the Flue Cured Organics transported from ULNA to the landfill in 2011. At a cost of $50/ton, this could be a significant savings for ULNA.

In addition, the ISO 14000 EMS effort ongoing at ULNA suggests a process for reducing environmental impacts. Compost processes offer potential for reducing environmental impacts of the MSW operations at ULNA. The compost operation offers significantly higher potential to control impacts associated with the management of the MSW from ULNA; the compost is produced at a single location and better control possible that with the land treatment. The compost potentially generated is a marketable product and the sustainability of the compost operation is higher than the ongoing land application operation – especially if the product is marketed as valuable compost.

Finally, there is significant opportunity to mix and commingle a variety of agricultural, agribusiness and other by-products generated in the area into the compost product; whether accomplished by ULNA or a contractor, compost processes offer opportunity for demonstrating a strong commitment to sustainability. The effort at the ULNA operation could be "exported" to other Universal operations facing similar challenges regarding solid waste management.

Costs for the compost operation are small. Elements of cost include:

1. Initial mixing and blending - $3.00/ cu. yd
2. Aeration: $1.00/cu. yd
3. Monitoring: 200/windrow (200 yds/windrow or $1/.00/yd)
4. Testing: $100.00 per 10,000 cu. yd or $.01/cu yd
5. Assessment: 80 hours
6. Report: 10 hours

I believe the justification for the compost demonstration is clear. The long term benefit far outweighs the current practice consequence. I will be honored to assist in this effort any way deemed helpful.

Please find a draft letter/request to be submitted to DWM below. This is a draft and additional word-smithing may be necessary.

Mr. Tony Gallagher
Chief Compost Branch, Solid Waste Section
NCDENR – DWM
217 Jones St.
1646 Mail Delivery Center
Raleigh, NC, 27699-1646

Dear Mr. Gallagher;

Subject: Solid waste composting at Universal Leaf North America (ULNA)

The management of agribusiness residues has recently received considerable regulatory attention. The Tobacco dust and leaf waste generated at the Universal Leaf (ULNA) facility near Nashville, NC or any commercial operation are considered regulated wastes and must be handled through approval from the NC Division of Waste Management (DWM) if it is managed through any of the beneficial use options recognized by the state. The only solid waste management options available which do not require approval are disposal through a permitted solid waste facility such as a landfill or an incinerator.

Both composting and land application are options available to manage the agribusiness residues that constitute the solid wastes generated at ULNA. The Nashville facility has been utilizing an onsite land application operation for approximately 10 years. The approved receiver sites at ULNA are well suited as receiver areas; soil testing accomplished on these areas indicate increasing levels of soil test phosphorus. A compost demonstration facility and associated marketing plan offer an additional outlet for the vegetative waste from ULNA and potentially other agribusiness wastes generated in the area. Utilization of the compost alternative offers an option for ULNA, conceivably no Tobacco Related Material will be transported to the landfill.

A site investigation was accomplished and soil core samples were collected from two areas examined as potential areas for development of compost demonstration sites. The areas examined are currently serving as storage areas and contain approximately 1 to 1.5 acres. The results of the site assessment are important in determining the suitability of potential compost production sites; soil in and near the storage bins is typically compacted clay and no evidence of seasonal saturation was evident within 36 inches of the soil surface. The soil assessment indicates the site occupies an upland position with no evidence of seasonal saturation within 36 inches of the land surface. The topsoil is compacted sand while the subsoil is compacted clay loam to sandy clay.

The Tobacco dust contains moderate concentrations of essential plant nutrients. These nutrients must be added to either a compost facility or to a land application operation at rates appropriate to assure no contamination of soil groundwater, or surface water. A typical waste analysis for some of the agribusiness residues which can be composted are presented in the table below. The primary activity proposed is compost production utilizing the dust; other agribusiness waste materials also generated at ULNA will be

added to improve the quality of the compost. These are primarily the stem collected in the initial processing; historically this wastestream has been transported to a landfill and the compost will allow beneficial use of this material.

The entire volume of tobacco waste generated at ULNA is proposed for inclusion in this program. Typical analysis for these materials is presented in the table below.

	N %	N (lb/T)	P %	P (lb/T)	K %	K (lb/T)	C:N
Tobacco dust	0.5 – 2.0	10 - 40	0.2 – 0.4	4 - 8	2.0 – 3.0	40 – 60	40:1
Tobacco stem & leaf	0.5 – 2.5	10-50	0.15-0.2	3-4	0.5-0.6	10-12	15:1 to 20:1

Compost manufactured from tobacco with the potential to blend various organic admixtures generated at ULNA will be valuable for agricultural, horticultural, and silvicultural production throughout the southeast.

Through beneficial use options, these nutrients must be assimilated into compost and then land applied for assimilation into the plant - soil system. The advantage offered through composting is an all season/all weather option to manage the tobacco stem, leaf and dust wastes generated at ULNA. This is important since material can not be applied to land when site and soil conditions preclude access to the field, but waste can be composted any time.

Specific information that must be submitted to the Division of Waste Management (NCDWM) to obtain the required demonstration approval is provided below.

Permittee:

Universal Leaf, North America
Mr. Kyle Bass and Mr. John Sabatini
3147 Boddie Mill Pond Road
Nashville, NC, 27856

Office: 252 462 4334

Justification:

Agribusiness wastes often contain valuable levels of essential plant nutrients. These plant nutrients can be recycled back to the land to support plant growth and production or they can be transported to a permitted solid waste facility for ultimate disposal. The land application and beneficial use option proposed supports the recycling of agribusiness waste back onto the land. Conversion of the agribusiness residues into compost will be beneficial for the cropping systems supported by Universal Leaf and other tobacco crop processors, the soils supporting crop growth and environmental quality in the area. The

sites proposed as compost production areas are currently utilized as storage areas for the dust. The primary area proposed is located toward the front of property between Boddie Mill Pond Rd. and Coleman Drive; the main entrance to the facility. The storage areas proposed as compost production areas contain a compacted soil base and is bermed along the long side of the storage bin. The secondary area was previously used as a bunker silo. The location of the proposed compost production areas are provided on the attached map. The areas are on an isolated portions of the ULNA site and there is very little site traffic, access to the area is limited to a few operations personnel. Access to the proposed compost production/demonstration site is through a normally locked gate.

Waste-stream-ingredients:

The waste-stream to be composted includes only vegetative agribusiness residues from the processing operation at ULNA. The compost production demonstration proposed is intended to accommodate the culled tobacco waste processed annually (Tobacco dust, culled leaf, grass, stalk, suckers and stem) at the ULNA facility near Nashville, NC. Other feedstocks generated on the site area and well suited for inclusion in a compost operation include hay from the receiver sites currently receiving the dust and the yard and leaf waste generated by landscaping operations at ULNA. At present, the only material proposed for composting is the vegetative waste generated annually at ULNA. The anticipated annual waste-stream for the facility consists of the tobacco dust, culled tobacco leaf and waste stem.

4000 tons of tobacco dust waste (C:N 30-50:1, C:P 100-150:1)
200 tons Flue Cured organics – typically culled leaf and stem (C:N, 15-20:1, C:P 150-200:1)
100 tons Burley Organics – typically culled leaf and stem (C:N 15-20:1, C:P 150-200:1)

TOTAL: 4300 tons

No materials other than those agribusiness wastes from ULNA are proposed for inclusion in the compost demonstration. The feedstocks are typically very dry and a small volume of moisture is required to optimize the compost process. Approximately 20 gallons of water will be added to each ton of the dust to control dust and to add moisture to the process.

Management Method and Project Methodology:

The primary management method proposed is composting. The vegetative waste (tobacco dust, leaf and woody stem) will be blended and mixed to produce compost. The estimated mass is 4300 tons: 4000 tons as dust and 300 tons as Burley and Flue Cured Organics. The volume of vegetative waste is approximately 85 to 90 percent of the mix and woody stem and leaf will be used to produce the remaining 10 to 15 percent of the primary mix (the mix will be blended on a by volume basis and the woody stem waste will be recycled through the process to minimize cost). These materials all generated at ULNA will be

mixed and blended to produce compost. The initial composting activities will be conducted in aerated windrows. The initial operations are proposed as simple mixed/aerated windrows using the lift and drop method to create the initial mix and an aerated pile to complete the process. This will minimize operational complexities associated with the mixing and blending. No human waste is included and the primary issue in this compost activity is plant pathogen control, hence compost temperature targets are higher than the PFRP requirements in state and federal rules.

Compost processes require a temperature rise from ambient levels at the beginning of the process to levels over 140 degrees within two (2) weeks of the initial blending to reduce viability of weed seed and plant pathogen levels. Temperatures in a windrow must be monitored to assure these initial high temperatures are reached. Since the material contains no human waste, the PFRP requirements in rule are not as critical as other operations, but the potential plant pathogen inactivation is critical. Vector attraction reduction (VAR) will be achieved by the temperatures and the time at high temperature. PFRP and VAR processes will be achieved by maintaining the temperatures over 135 degrees for over 15 days. Additional compost processing will be accomplished as routine parts of the operation to assure no temperature rise to over 120 degrees following PFRP/VAR compliance. Typically, the stabilization will require an additional 30 to 45 days of composting and turning may be accomplished to achieve a high quality product.

In this facility, the compost windrows will be monitored to assure temperatures reach the target 140 degrees F for weed seed control and the required 131 degrees F for the required 5 consecutive days within the static aerated piles. The temperature will be monitored and recorded within each of the compost windrows. Long stem temperature probes will be used to test temperatures at approximately 25 foot internals along each of the demonstration windrows. Temperatures will be recorded at 24 and 36 inches into the compost windrow. The temperature monitoring will be used to optimize compost operations. When compost windrow temperatures fall to131 degrees following the initial mix, aerators will be energized to maintain proper temperature within the windrow. The temperature range targeted is between 131 degrees F and 140 degrees F during the active compost cycle. When the temperatures fail to rise above 120 degrees following a compost aeration cycle operation, the material will be considered mature and ready for curing. Initial compost windrow mixing and turning will be accomplished with a large front-end loader (3 yard bucket) and subsequent temperature control will be provided by the 0.25 to 0.5 HP windrow aerators.

Typical extended pile windrows will measure 30 feet at the base width with aeration lines at 10 and 20 feet, by 100 feet length with aeration independent aeration lines providing air in the 10 to 50 foot section and a separate line supplying aeration to the 60 to 90 foot section. Aeration will begin at 10 feet and terminate at 90 feet. The aerated piles will range between 4 and 5 feet in height. The blower motor proposed is 0.5 HP and the Dayton Blower has a capacity of 1000 to 1100 SCFM.

Standard 4 inch diameter corrugated drain pipe will be used in the aeration network. The pipe is Crumpler corrugated pipe manufactured in Roseboro, NC. This pipe has a 5/8 inch

circular perforation every 6 inches along the pipe. The aeration system will be placed at the 10 and 20 foot location along the 30 foot windrow width. The aeration lines will run as dual 40 foot sections. The initial 10 feet will be tight or un-perforated to allow air to enter the aerated pile, the remaining 40 feet will provide air to the first half of a static windrow pile. The next 40 foot section will run from 50 to 90 feet to supply air to the next portion of the pile. The dual lines will allow development of the piles in sections measuring 40 feet at the base, 100 foot length and 4 to 5 feet in height.
The aeration lines in base of each windrow will be placed on the pad surface and covered with wood-chips. The line of wood chip will extend approximately 1 foot out on both sides of the corrugated pipe. This will allow distribution of the air along the pile base and into the mass in the aerated static pile. The aeration lines will be placed at the 10, 20, and 30 foot width of the 40 foot wide aerated pile.

As the facility matures, continued use of the aerators and varying aeration line configurations will be assessed. In addition, a windrow turner or bin operation will be explored as a long term compost system management option should the demonstration prove economically successful.

The lift and drop loader bucket will be used to mix, blend and turn materials to initiate the compost process. Mixed/blended material intended for compost will be placed in windrows with a loader and as temperature monitoring indicates a need to turn windrows, product will be aerated using the electric blower. This will facilitate reaeration of the composting materials and maintenance of proper temperatures in the active windrows.

Since composting processes consume nutrients, the application rate for the composted material is assumed to be10 tons per acre per year, the potential loading rates for the compost product will be assessed by sampling as provided through traditional NCDA waste analysis. Estimates of compost quality from similar operations suggest the mature compost could supply between approximately 100 to 150 pounds of plant available nitrogen per acre per year with loads of 10 tons compost per acre.

Large areas of the ULNA site are currently permitted to receive the waste tobacco dust from ULNA. Portions of the existing site will be designated as receiver areas for the composted material; ideally these receiver areas will be located in areas currently designated as buffers (compost should be suitable for use in areas on the site previously designated as buffer areas) where no dust had been applied. No un-composted dust will be applied to the test areas. These test plots will be used to assess compost impacts to plant growth and soil quality. The compost will be added as determined by NCDA soil test criteria and the NCDA waste analysis. Detail on the compost assessment/evaluation phase will be provided as sites and crops are designated.

All records pertaining to the compost operation must be maintained by personnel at ULNA. The records pertaining to the compost operation must be submitted to the DWM as a part of the annual report and will include results from this demonstration as well as any land treatment accomplished.

Site Characteristics:

The areas examined as potential compost production sites are located on isolated portions of the permitted land application site serving as the receiver for dust. The proposed sites consists of the existing storage area with compacted base as primary site and an old silo area with sidewalls and a compacted base as secondary site. These areas have been utilized previously to store dust prior to land application.

Testing:

The dust has been tested frequently as a condition of the ongoing operation. Typical NCDA waste analysis is included for information. In addition, the summary of the 2011-12 annual report is presented in the table below.

N	P	C	CN	CP
1.64	0.17	18.7	1.5:1	110:1
2.19	0.21	23.3	10.5:1	111:1
2.18	0.22	21.7	10:1	100:1
2.34	0.25	23.3	10:1	93:1
2.28	0.24	22.7	10:1	95:1
1.59	0.16	21.3	13.4:1	133:1
3.79	0.30	32.0	8.4:1	107:1
2.54	0.22	22.0	8.7:1	100:1
2.17	0.24	18.9	8.7:1	79:1
2.3	0.22	22.7	9.9:1	102.1:1

These are C:N and C:P ratios which are within the boundaries of composting. The values are slightly higher than many compost operations where the desired range is 20:1 for C:N and 150:1 for C:P, but composting is clearly possible. The C:N and C:P ratios may be adjusted by addition of hay from the agricultural operations ongoing at ULNA, but the need for that addition is not clear at this time and that is the purpose of the demonstration proposed – to optimize the admixtures and blends.

Product testing will continue throughout the demonstration proposed. NCDA waste analysis will be accomplished monthly. In addition, a coliform test will be used to document the pathogen reduction. The coliform will be accomplished as required in rule (6 months schedule) and the NCDA will be accomplished monthly. The foreign matter content will be measured using a manual separation as described in rule.

Schedule:

The proposed demonstration is planned for the 2012-13 processing season. This typically begins in September and concludes in June or July. The initial demonstration is planned for September 2012 through July or August 2013. If the initial activity is deemed successful, the management may propose to extend the demonstration through the 2013-14 processing season.

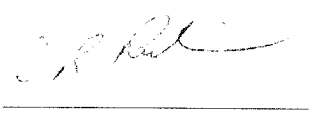
Reports:

An annual report will be submitted to the state DWM delineating the following:

1. volume of material recycled through composting and land application
2. characteristics of vegetative waste compost product applied to sites
3. results of soil testing from designated receiver sites
4. results of the time/temperature monitoring accomplished on the compost

Please accept this request submitted in support of the request by ULNA. The management of ULNA is committed to continue to manage vegetative waste in an environmentally sound manner and this compost/land application effort is economically sound and economically attractive.

Sincerely;



A. R. Rubin, Professor Emeritus
Biological and Agricultural Engineering
North Carolina State University

Attachment to Permit Application

Information on equipment we will be using for this project:

Fan - Radial Blade High-Pressure Direct-Drive Blower

Wheel Diameter = 8-15/16"

Brand = Dayton Model # 2C820

Motor - 3-Phase Premium and Energy Efficiency Open Drip Proof Motor

½ HP, 208-230/460 Volts

Front-end Loader

- John Deere Tractor w/ 3 cubic yard bucket.

If leachate were to become a problem, the ULNA US leachate contingency plan would be one of four options.

a) Compost operations would be located on asphalt, concrete or another impermeable surface that is capable of withstanding the wear and tear from normal operations and will prevent the release of leachate into the environment.

b) Have roof, cover or prepared surface designed to prevent:

   i. The surface collection of water around the base of organic matter and compost and

   ii. Runoff water from entering the receiving, storage, processing and curing areas

c) Have a leachate collection system designed, constructed, maintained and operated to reuse leachate, or remove leachate from the receiving, storage processing and curing areas.

d) If, through research, one of the methods above does not prove cost effective for ULNA US, compost operations will cease and the organic material will be diverted back to a landfill.

Mr. John Sabatini
ULNA
3147 Bodie Mill
Nashville, NC, 27809

Dear Mr. Sabatini;

Subject: Solid waste composting

The letter attached must be submitted to Mr. Tony Gallagher, NCDENR – DWM. He is responsible for permitting solid waste operations throughout the state. My letter to you must be submitted along with a letter from you requesting the land application and composting program. In your letter confirm that you will be responsible for conducting the required activities and that you agree with the recommendations provided.

We have provided a location map of the site previously. Soil maps of the area are also helpful. These are all available from the local NRCS office.

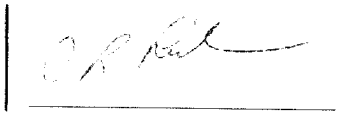
Comments to the October Gallagher E-Mail are:

1. Location: the location is described in the proposal. In addition, ULNA is to supply a map.
2. Ingredients: the admixtures are listed in the proposal as wastestream/ingredients and waste analysis from previous reports is included for information purposes.
3. The testing is described in the proposal; C;N and C:P ratios are provided and a more frequent testing protocol is recommended (monthly NCDA analysis) and semi-annual coliform testing.
4. The schedule is provided in the proposal.
5. Methodology is described in the section entitled management method and project methodology
6. The aeration is described in the methodology section as a static aerated pile method.
7. Blending is described as a lift and drop method to develop the initial compost mixture and this will be followed by aeration in the windrow with final product storage and mixing prior to application onto the site.
8. The monitoring protocol is described in the management method and project methodology section.
9. Leachate has not been an issue because the dust is very dry and no leachate has been generated on the storage sites. Any runoff from the site is assimilated in the grassy area down-gradient from the site.
10. On-site storage will be provided on portions of the existing pad unused as aerated windrow, these areas are currently used for product storage prior to the permitted land application operations.
11. End product testing is described in the testing section, NCDA waste analysis will be used to measure nutrients and metals, a private certified laboratory will be used

for coliform testing, and NCSU-BAE laboratory will be used for the foreign matter measure.

I hope these issues have been addressed adequately in the revised request. If I may be of any assistance to you, please advise. Please submit this letter along with the request to Mr. Gallagher.

Sincerely;



A. R Rubin

High Pressure Direct Drive Radial Blade Blower, Wheel Diameter 8 15/16 Inches, Wheel Bore 1/2 Inch, Inlet Diameter 5 Inches, Outlet Height 3 1/2 Inches, Outlet Width 3 1/2 Inches, Mounting Hole Diameter 3/8 Inch, Maximum Inlet Air Temperature 180 Degrees F, CW Rotation Viewed From Drive Side, Without Motor, Recommended Motor Power Rating 1/2 HP @ 3450 RPM

Fan - Radial Blade High-Pressure Direct-Drive Blower
Wheel Diameter = 8-15/16"
Brand = Dayton Model # 2C820
Motor - 3-Phase Premium and Energy Efficiency Open Drip Proof Motor
½ HP, 208-230/460 Volts

Should produce about 1100 CFM.