DISSOLVABLE AIRFLOW BARRIER (DAB) TECHNICAL SPECIFICATIONS

Cambridge Research & Development

Dissolvable Airflow Barrier (DAB) panels are designed for use in both Cold and Hot air containment designs. The panels are made of a proprietary paper formula that is designed to dissolve quickly when exposed to water. This capability makes DAB panels ideal for containment design as the panels do not obstruct the dispersal of water when sprinkler systems are activated.

Additionally, the panels are ASTM E84 Class A rated and EPA safe. Once the fire sprinkler system is activated, the material will dissolve and be swept away into the water drain. Fire protection personnel activities will not be impacted by falling panels or floor debris.

NOTE: In the US, in Cold Aisle configurations, DAB panels must be installed with Air Flow Flaps (AFF) every 6 to 8 linear feet.

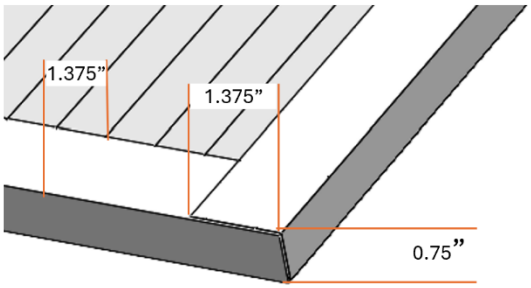
FEATURES

- All-paper panel consisting of pleated, dissolvable material surrounded by a paper frame.
- Framing material is glued and stapled to center pleat, creating a rigid panel which can be gripped or pressed upon if the panel needs to be moved.
- Panels can be cut with scissors or a blade, allowing the panel to be fit over and around any existing infrastructure such as trays, poles or pipes.
- Patch kits are available which include panel frame material and specialized glue. The installer will need to supply a stapler and scissors.
- Velcro tabs are provided with each panel as a means of providing additional adhesion, should it be needed.

MATERIAL SPECIFICATIONS

- Panel is 0.75” (19mm) in height.
- Panels are 2x2ft and weighs 0.75lbs (0.34kg)
- Pleated material is ASTM E84 Class A rated. Test result can be downloaded from dabpanel.com website
- Frame consists of ASTM E84 Class A stock, 0.0175” (0.4445mm) thick, 185lbs weight.
- Corners are stapled with P3, 24/6, 6mm long staples.
- Panel frame is 1.375” (34.9mm) wide by 0.75” (19mm) tall

Panel Dimensions



AIR FLOW FLAP (AFF)
TECHNICAL SPECIFICATIONS

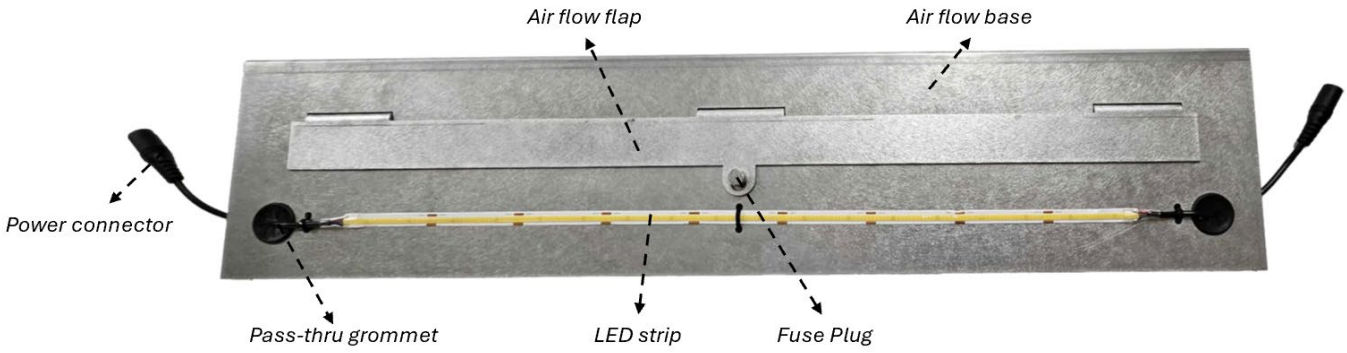
Cambridge Research & Development

FOR COLD AISLE INSTALLATIONS ONLY

The Air Flow Flap (AFF) is a stand-alone component sold with Cambridge R&D's Dissolvable Air Barrier (DAB) panels. The AFF replaces the Firewire and lighting solutions which were included with the v1.0 DAB panels.

The AFF is placed in-line with the DAB panels, providing both enhanced air flow and lighting. All AFF's come with lighting installed but it is not necessary for the lighting to be active for the panel to provide air flow capabilities.

The AFF panels, when used for lighting, can be connected in chains of up to 10 panels to providing lighting in one or more aisles. CRD also sells power supplies, switches, and cabling to support lighting activation. The AFF is now sold separately and can be placed in-line with DAB panels in cold aisle containments deployments.



FEATURES

- Fire-activated incremental air flow for faster activation of overhead sprinkler systems.
- Direct LED lighting for increased visibility and reduced power demand.
- Ten (10) AFF panels can be chained to a single power supply, which can be connected to a 110v wall or C13 rack outlet.
- AFF can be repurposed when aisle configurations are modified.
- Require no special tools to install or repurpose.

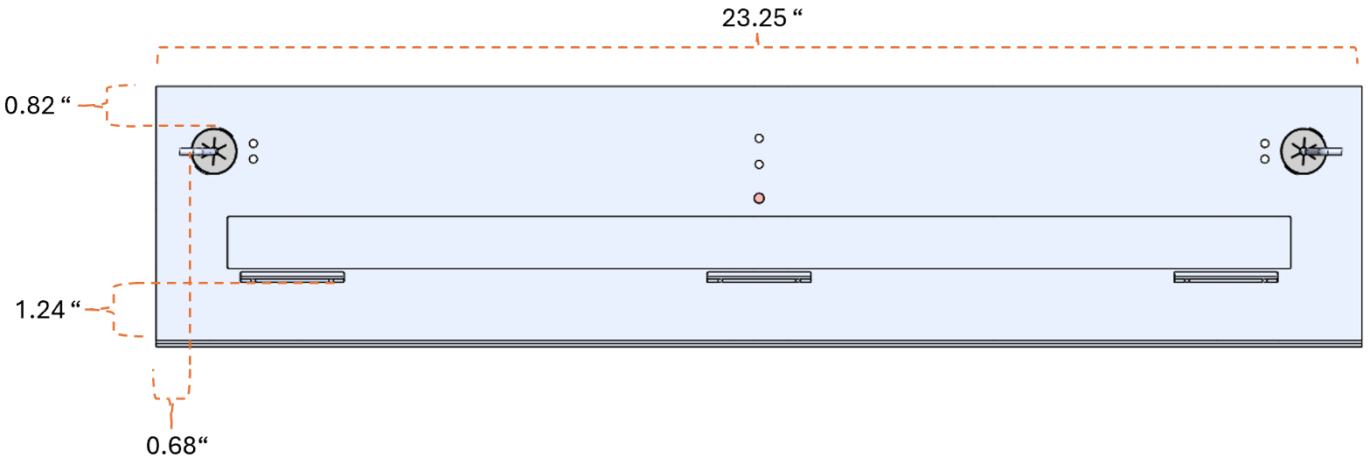
MATERIAL AND LIGHTING SPECIFICATIONS

- AFF is activated by 165F fusible threaded solder plug. The plug is vibration resistant and made of Brass Alloy 260. Manufactured by Elsie Manufacturing. UL33 certified.
- AFF is made of brushed 6063 Aluminum, 1/16 inch thick (0.0625 in, 1.59 mm)
- AFF should be installed ever 6-8 feet along the length of the row.
- Lighting is provided by a 24v LED lighting strip.
    - 5w power consumption per panel.
    - Color: White 6500K
    - Brightness: 1050L/m^2
    - UL Certified: 20160721-E485696
    - DC female connector on both ends, 5.5x2.1mm connector

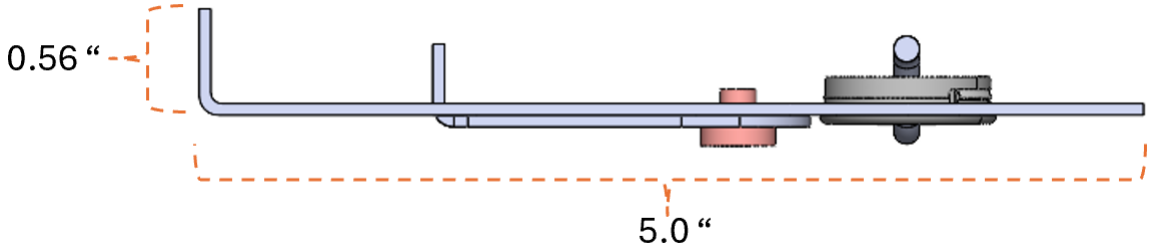
MECHANICAL SPECIFICATIONS

- The Air Flow Flap (AFF) is approximately 24 inches long, 5 inches wide and ½ inch high.
- The AFF weighs 12.7 ounces (0.8 lbs, 0.36 kilograms)
- The fuse plug will melt off at 165F allowing the flap to open and air to vent from the aisle into the space above.
- The flap will NOT fall out of the AFF as the hinges have been slightly expanded to exceed the slot size.
- A minimum of 0.5 inch clearance has been provided around the edge of the AFF to allow for adhesive tape, should it be required.
- The AFF should be mounted with the light strip and sticker facing the floor.

Bottom view

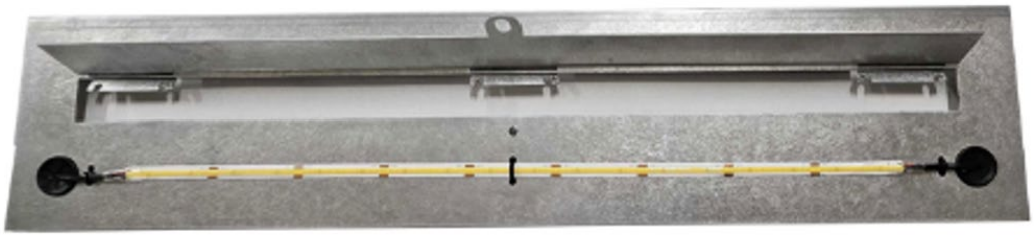


Cross section



AFF WITH LIGHT ACTIVATED

AFF WITH FLAP ACTIVATED



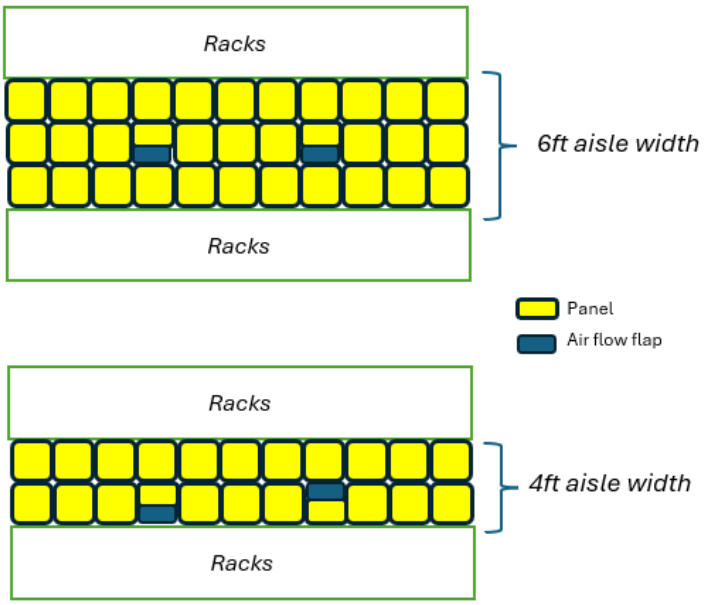
INSTALLATION RECOMMENDATIONS

AFF panels need to be installed every 6-8 feet in every aisle.

Depending upon the aisle width and orientation, the AFF panel can be installed in various configurations.

Typically, a full DAB panel is cut down by 5 inches in length to accommodate the placement of the AFF panel. The new DAB panels, being constructed entirely of paper, can be cut easily with scissors and recapped to make room for an AFF panel.

While the examples on the right are suggested installation patterns, installers should feel free to cut the panels in any configuration to support lighting needs.



HED

WWW.HED.DESIGN

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15301 Spectrum Dr.
Suite 450
Addison, TX 75001

T 972.934.8888

May 2, 2024

Mr. Jason Clark
Principal Engineer, Advanced Engineering Group
Digital Realty
10 Post Office Square, Suite 500
Boston, MA 02109

Subject: CRD Dissolvable Air Barrier

Dear Mr. Clark:

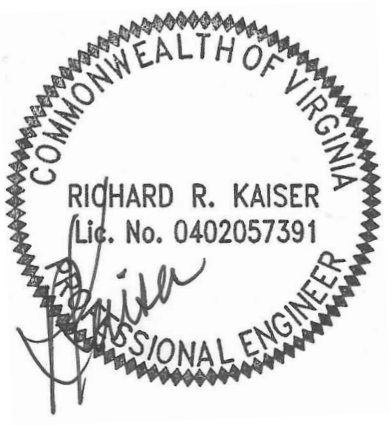
Digital Realty has asked HED to review the Cambridge Research and Development (CRD) Dissolvable Air Barrier (DAB) product from a fire protection perspective for use and applicability as an air containment solution in their data centers.

The CRD DAB is a paper barrier that dissolves completely when in contact with water. The product would be used as a ceiling in hot or cold aisle containment applications, with sprinklers installed above but not below the ceiling. Each panel is fitted with a fusible link holding a wire under tension, when the fusible link activates the wire will tear the paper barrier open to allow heat from a fire to travel above the ceiling to the fire sprinklers. Subsequently, when the sprinklers activate, the water spray will immediately dissolve the paper barrier and spray water onto the fire without obstruction. This containment ceiling will not fall onto personnel below, will not accumulate on the floor after it dissolves, and will not contribute to the growth of a fire. The product has been UL E84 tested with excellent results for flame spread index (20) and smoked developed index (0).

It is HED's opinion that this product will not compromise the fire protection or fire detection in a data center application.

Sincerely,

Richard R. Kaiser, P.E.
Associate Principal
Senior Fire Protection Engineer
Virginia P.E. 0402057391



70 Walden Pond Dr
Nashua, NH 03064
www.cambridgerad.com

Phone: (603) 263-7110
Fax: (603) 263-7110

Safety Data Sheet
Dissolvable Air Barrier Paper: DAB

Last Revision Date: 1/1/2024

Reviewed Date: 1/1/2024

SECTION 1: IDENTIFICATION

Product Identification	Dissolvable Air Barrier (DAB) Paper
Related Part #:	DAB
Chemical Product Name:	Sodium Carboxymethyl Cellulose
Recommended Uses:	Air Flow Containment Structures
In case of emergency:	Cambridge R&D 70 Walden Pond Dr Nashua, NH 03064 (603) 263-7110

SECTION 2: HAZARD IDENTIFICATION

GHS Categories:	None. This product does not contain hazardous material
Signal Word:	N/A
Pictogram:	N/A
Physical Hazards:	Flammable – Same as general paper
Health Hazards:	
Eye Contact:	May cause irritation if contact with eye is made.
Environmental Hazards:	N/A

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture:	Cellulose mixture, wooden pulp
CAS Number:	
Sodium Carboxymethyl Cellulose:	9004-32-4
Wooden Pulp:	65996-61-4

SECTION 4: FIRST-AID MEASURES

Eye contact:

Immediate Symptoms:	Irritation, tearing
Response:	Gently rinse the affected eye with clean water. Examine and obtain treatment from a doctor/physician if required.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Method:	Same as general paper.
Specific Hazards:	None.
Hazardous Combustion Products:	Carbon dioxide, carbon monoxide, smoke.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Precautions:	None
Personal Precautions:	None
Environmental Precautions:	N/A
Cleanup Procedures:	Sweep up and remove residue.
Disposal Methods:	Dispose of according to Section 13.

SECTION 7: HANDLING AND STORAGE

Handling:	Same as general paper. Use dust respirator and safety glasses while handling.
Storage:	Store in warehouse. Wrap with a moisture-proof film such as polyethylene. Avoid high temperature and humidity.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

OSHA Exposure Guidelines:	None. This product does not contain hazardous materials.
ACIGH Exposure Guidelines:	None. This product does not contain hazardous materials.
Facility Consideration:	N/A
Personal Protection:	Use dust respirator and safety glasses to avoid effect of exposure to paper-dust when required.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White paper	Upper Explosive Limit:	N/A
Odor:	None	Lower Explosive Limit:	N/A
Odor Threshold:	N/A	Vapor Pressure:	N/A
pH:	4.5	Vapor Density:	N/A
Freezing Point:	N/A	Relative Density:	Same as General Paper
Melting Point	N/A	Solubility in Water:	1% dispersion in water, stirring required for greater dispersion
Initial Boiling Point/Range:	Same as General Paper	Partition Coefficient:	N/A
Flash Point:	Same as General Paper	Auto-ignition Temperature:	N/A
Evaporation Rate:	N/A	Decomposition Temperature:	Same as General Paper
Flammability:	Same as General Paper	Viscosity:	N/A

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical Stability:	Stable under normal conditions.
Incompatible Materials:	None.
Conditions to avoid:	Avoid high heat and humidity.

Hazardous Decomposition Products:	Carbon dioxide, carbon monoxide, smoke.

SECTION 11: TOXICOLOGICAL INFORMATION

Likely Routes of Exposure:	Eye contact
Eye Contact:	Contact may cause burning sensation, blurred vision, inflammation, swelling, redness, and/or tearing.
Carcinogenic Toxicity:	N/A. This product is non-toxic.

SECTION 12: ECOLOGICAL INFORMATION

Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

This product can be disposed of in the same manner as general paper.

SECTION 14: TRANSPORT INFORMATION

Avoid contact with water and rough handling. This product is neither dangerous nor hazardous and has no restrictions for air, ocean, or ground transport. There are no requirements for packaging in reference to transport regulations.

SECTION 15: REGULATORY INFORMATION

Not applicable.

SECTION 16: OTHER INFORMATION

The information contained herein is based on data considered accurate. However, to warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof. Regulatory information is intended to be as complete as possible. It is ultimately the user's responsibility, however, to determine state, and local laws in the use of this product. Cambridge R&D assumes no responsibility for personal injury or property damage to users or third parties caused by the material. Such users assume all risks associated with the use of the material.

Cambridge Research & Development

Cambridge R&D Dissolvable Air Barrier Paper Specification Sheet:

This notice certifies that Cambridge DAB Paper has been manufactured mainly from Sodium Carboxy Methyl Cellulose, wooden pulp and has been tested and conforms to the following specifications:

PHYSICAL PROPERTIES	**Item ID#: DAB**
THICKNESS (mils)	~7.0
DENSITY (g/cm^3)	0.60
BURSTING STRENGTH (kPa)	364
TENSILE STRENGTH (kN/m): MD	6.78
TENSILE STRENGTH ((kN/m): CD	2.06
WATER DISPERSION TIME (s): FIBER	< 30
STRETCH at BREAK (%): MD	2.9
STRETCH at BREAK (%): CD	5.5
BRIGHTNESS (%)	85.0

This certificate indicates these items have been inspected and tested by a 3rd party testing laboratory and meets all requirements mandated by the company.

Ken Steinberg 10/14/2023

70 Walden Pond Dr • Nashua NH 03064
TELE/FAX (603) 263-7110

Certificate No. : BKC212503SC

Certificate of Conformity

Applicant	:	**Shenzhen Coxo Technology Co., Limited** 3F, Building 11-1, Longshan Industrial Park, Buji Town, Longgang District, Shenzhen, Guangdong 518114, China
Manufacturer	:	**Shenzhen Coxo Technology Co., Limited** 3F, Building 11-1, Longshan Industrial Park, Buji Town, Longgang District, Shenzhen, Guangdong 518114, China
Product	:	**LED STRIP**
Model(s)	:	**2835 LED Strip, 3528 LED Strip, 5050 LED Strip, 2216 LED Strip, 2110 LED Strip, 3838 LED Strip, 3535 LED Strip, 3014 LED Strip, 5630 LED Strip, 2811 LED Strip, 2812 LED Strip, 2813 LED Strip, 2815 LED Strip, COB LED Strip, CSP LED Strip, 335 LED Strip, 4014 LED Strip, 3030 LED Strip.**
Test Standard	:	**EN IEC 55015:2019+A11:2020** **EN IEC 61000-3-2:2019** **EN 61000-3-3:2013+A1:2019** **EN 61547:2009**

The Certificate of Conformity is based on an evaluation of a sample of the above mentioned products. It does not imply an assessment of the whole production. It is possible to use CE marking to demonstrate the compliance with this EMC Directive 2014/30/EU. It is only valid in connection with the test report number:BKC212503SR.

CE

Manager

Sep. 28, 2021

Shenzhen BKC Testing Co., Ltd.
6/F, Building 3, Zhouteng Industrial Park, Nanwan Street, Longgang District, Shenzhen, Guangdong, China. Tel:4000-875-382 0755-84829082
E-mail: bkc@bkc-lab.com Certificate Search: http://www.bkc-lab.com

CERTIFICATE OF COMPLIANCE

Certificate Number	20160721-E485696
Report Reference	E485696-20160720
Issue Date	2016-JULY-21

Issued to: Shenzhen COXO Technology Co Ltd
3F 11-1 Longshan Industrial Park
Buji Town Longgang District
Shenzhen
Guangdong 518114, CHINA

This is to certify that representative samples of LOW-VOLTAGE LIGHTING SYSTEMS, POWER UNITS, LUMINAIRES AND FITTINGS

Surface Mounted, Model AXXXX-CCC-BBB-VEE-DDDD series, where the "A" denotes Commercial code - can be any letters; Where the "XXXX" denotes LED package type - can be any letters; Where the "CCC" denotes the product design code - can be any digit number from "1" to "999"; Where the "BBB" denotes the LED color temperature - can be any 1 to 3 letters or blank; Where the "EE" denotes the input voltage - can be any digit number or blank; Where the "DDDD" denotes the length/density of product - can be any 1 to 4 digit number or blank.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 2108, Low Voltage Lighting Systems.
UL 8750, Light Emitting Diode (LED) Equipment for Use in Lighting Products.
CSA C22.2 No. 250.0-08, Luminaires.

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program
UL LLC

Elsie Manufacturing Co.

600 W. Maple St.
Box 97
Waterloo, IN 46793
260-837-8841

Since 1947

Certificate of Conformance/Origin

CAMBRIDGE R & D
CUSTOMER NAME

70 WALDEN POND
STREET

NASHUA NH 03064
CITY, STATE ZIP CODE

KEN
CUSTOMER PURCHASE ORDER NUMBER

Elsie Manufacturing Co. certifies that the items listed below have been manufactured, inspected, and tested in our facility in Waterloo, IN 46793 and have been found to meet the requirements set forth in the applicable UL 33 specifications. The items listed below were manufactured on December 3, 2024 and meet requirements set forth by the Purchase Order referenced above as well as but not limited to all applicable drawings and/or cut sheets in our possession for this particular part.

When installed in specific applications, the actual operating temperature of the link may vary slightly. It is the responsibility of the purchasing party to verify that the link/links will work correctly in their application.

All records pertaining to these items are on file at Elsie Manufacturing Co., and will be held on file for a minimum of two years, unless otherwise specified in the purchase order requirements. For a fee, these records can be made available for examination by you or your customer if requested.

Invoice #:	Qty:	Description:	Part#:	TOT*	SCW#:	Mound #:	Batch #:	Lot #:
8526	550	Model B165	FL165B	165.5	NA	NA	283	870

*Tested Operational Temperature (F)

Julie Minnick Assistant Office Manager 1/6/2025

ISSUING AUTHORITY (Julie Minnick) TITLE (Assistant Office Manager) DATE

ELSIE MANUFACTURING CO
P.O. BOX 97
600 WEST MAPLE STREET
WATERLOO IN 46793