

**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
AIR QUALITY DIVISION**

June 21, 2022

PERMIT TO INSTALL
247-02G

ISSUED TO
R.L. Adams Plastics, Inc.

LOCATED AT
5955 Crossroads Commerce
Wyoming, Michigan 49519

IN THE COUNTY OF
Kent

STATE REGISTRATION NUMBER
N7221

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environment, Great Lakes, and Energy. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: June 2, 2022	
DATE PERMIT TO INSTALL APPROVED: June 21, 2022	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

Table of Contents

COMMON ACRONYMS	2
POLLUTANT / MEASUREMENT ABBREVIATIONS.....	3
GENERAL CONDITIONS	4
EMISSION UNIT SPECIAL CONDITIONS.....	6
EMISSION UNIT SUMMARY TABLE	6
FLEXIBLE GROUP SPECIAL CONDITIONS.....	7
FLEXIBLE GROUP SUMMARY TABLE	7
FGPROD®RIND.....	8
APPENDIX A – Isopentane Usage Calculation	13
APPENDIX B – 1,1 Difluoroethane (152A) Usage Calculation	16

COMMON ACRONYMS

AQD	Air Quality Division
BACT	Best Available Control Technology
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
COMS	Continuous Opacity Monitoring System
Department/department/EGLE	Michigan Department of Environment, Great Lakes, and Energy
EU	Emission Unit
FG	Flexible Group
GACS	Gallons of Applied Coating Solids
GC	General Condition
GHGs	Greenhouse Gases
HVLP	High Volume Low Pressure*
ID	Identification
IRSL	Initial Risk Screening Level
ITSL	Initial Threshold Screening Level
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
MAERS	Michigan Air Emissions Reporting System
MAP	Malfunction Abatement Plan
MSDS	Material Safety Data Sheet
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutants
NSPS	New Source Performance Standards
NSR	New Source Review
PS	Performance Specification
PSD	Prevention of Significant Deterioration
PTE	Permanent Total Enclosure
PTI	Permit to Install
RACT	Reasonable Available Control Technology
ROP	Renewable Operating Permit
SC	Special Condition
SCR	Selective Catalytic Reduction
SNCR	Selective Non-Catalytic Reduction
SRN	State Registration Number
TBD	To Be Determined
TEQ	Toxicity Equivalence Quotient
USEPA/EPA	United States Environmental Protection Agency
VE	Visible Emissions

*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 psig.

POLLUTANT / MEASUREMENT ABBREVIATIONS

acfm	Actual cubic feet per minute
BTU	British Thermal Unit
°C	Degrees Celsius
CO	Carbon Monoxide
CO ₂ e	Carbon Dioxide Equivalent
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
°F	Degrees Fahrenheit
gr	Grains
HAP	Hazardous Air Pollutant
Hg	Mercury
hr	Hour
HP	Horsepower
H ₂ S	Hydrogen Sulfide
kW	Kilowatt
lb	Pound
m	Meter
mg	Milligram
mm	Millimeter
MM	Million
MW	Megawatts
NMOC	Non-Methane Organic Compounds
NO _x	Oxides of Nitrogen
ng	Nanogram
PM	Particulate Matter
PM10	Particulate Matter equal to or less than 10 microns in diameter
PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
pph	Pounds per hour
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
psia	Pounds per square inch absolute
psig	Pounds per square inch gauge
scf	Standard cubic feet
sec	Seconds
SO ₂	Sulfur Dioxide
TAC	Toxic Air Contaminant
Temp	Temperature
THC	Total Hydrocarbons
tpy	Tons per year
µg	Microgram
µm	Micrometer or Micron
VOC	Volatile Organic Compounds
yr	Year

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to Rule 210 (R 336.1210), operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to Rule 219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of Rule 219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal condition or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of Rule 301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with Rule 303 (R 336.1303). **(R 336.1301)**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001. **(R 336.2001)**

EMISSION UNIT SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date / Modification Date	Flexible Group ID
EUPRODUCTION	This emission unit includes all equipment used to manufacture the laminate and thermoformed goods but does not include the reclaim and regrind portion of the facility. This emission unit includes four storage silos for storing the raw polystyrene pellets, one 12,000 gallon isopentane storage tank, one 6,634 gallon 1,1, difluoroethane storage tank, four extruders which combine the blowing agent with the polystyrene resin to create the polystyrene foam sheet stock, the preproduction storage area for storing the extruded rolls, two laminators, five thermoformers for making thermoformed finished products, and the finished product storage and shipping warehouse.	03-20-2003 12-02-2020	FGPROD®RIND
EUREGRIND	This emission unit includes the grinders on each thermoforming machine, the scrap removal system (pneumatic conveyor system with in-line chopper) for the laminators and thermoformers, a large grinder in the grinding room, an extruder in the reclaim room, and five dust collectors (baghouses).	03-20-2003 TBD	FGPROD®RIND

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1291.

FLEXIBLE GROUP SPECIAL CONDITIONS

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGPROD®RIND	All equipment used to manufacture the laminate and thermoformed goods; extruders to produce the foam, laminators, and thermoformers; and the scrap removal system for the laminators, thermoformers, and central grinder.	EUPRODUCTION EUREGRIND

**FGPROD®RIND
 FLEXIBLE GROUP CONDITIONS**

DESCRIPTION

All equipment used to manufacture the laminate and thermoformed goods; extruders to produce the foam, laminators, and thermoformers; and the scrap removal system for the laminators, thermoformers, and central grinder.

Emission Unit: EUPRODUCTION, EUREGRIND

POLLUTION CONTROL EQUIPMENT

Five baghouse dust collectors

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. VOC	170 tpy	12-month rolling time period as determined at the end of each calendar month	EUPRODUCTION EUREGRIND	SC VI.1, VI.4, VI.7, VI.8, VI.9	R 336.1225 R 336.1702(a)
2. 1,1 difluoroethane	170 tpy ¹	12-month rolling time period as determined at the end of each calendar month	FGPROD®RIND	SC VI.2, VI.5, VI.6, VI.10, VI.11, VI.12	R 336.1224 R 336.1225
3. PM	0.01 lb per 1000 lbs of exhaust gases, on a dry gas basis	Hourly	Each baghouse in FGPROD®RIND	SC V.1, VI.3	R 336.1331

II. MATERIAL LIMIT(S)

- The permittee shall limit production and isopentane usage based on the following equation:
(R 336.1225, R 336.1702(a))

$(ITSE + ILSE + IST + ISL + IETFG + IELFG) \leq 340,000$ pounds of isopentane per 12-month rolling time period as determined at the end of each month.

Where:

ITSE = Pounds of isopentane from Thermoformer Scrap generated at Extrusion.

ILSE = Pounds of isopentane from Lamination Scrap generated at Extrusion.

IST = Pounds of isopentane from Scrap generated at Thermoforming.

ISL = Pounds of isopentane from Scrap generated Lamination.

IETFG = Pounds of isopentane from Thermoformed Finished Goods

IELFG = Pounds of isopentane from Laminated Finished Goods

How these values are derived is explained in Appendix A

2. The permittee shall limit 1,1 difluoroethane usage based on the following equation:¹ **(R 336.1224, R 336.1225)**

$(DTSE + DLSE + DST + DSL + DETFG + DELFG) \leq 340,000$ pounds of 1,1 difluoroethane per 12-month rolling time period as determined at the end of each month

Where:

DTSE = Pounds of 1,1 difluoroethane from Thermoformer Scrap generated at Extrusion.

DLSE = Pounds of 1,1 difluoroethane from Lamination Scrap generated at Extrusion.

DST = Pounds of 1,1 difluoroethane from Scrap generated at Thermoforming.

DSL = Pounds of 1,1 difluoroethane from Scrap generated at Lamination.

DETFG = Pounds of 1,1 difluoroethane from Thermoformed Finished Goods

DELFG = Pounds of 1,1 difluoroethane from Laminated Finished Goods

How these values are derived is explained in Appendix B

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall not operate EUPRODUCTION unless an instrument for monitoring isopentane usage on a continuous basis is installed, maintained, and operated in a satisfactory manner. **(R 336.1225, R 336.1702(a))**
2. The permittee shall not operate EUPRODUCTION unless an instrument for monitoring 1,1 difluoroethane usage on a continuous basis is installed, maintained, and operated in a satisfactory manner.¹ **(R 336.1224, R 336.1225)**
3. The permittee shall not operate EUREGRIND unless the dust collectors are installed, maintained and operated in a satisfactory manner. Proper operation includes installing a pressure drop monitor and maintaining the pressure drop of the dust collectors as specified by the manufacturer. **(R 336.1331, R 336.1910)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Upon request of the AQD District Supervisor, the permittee shall verify PM emission rates from one or more of the EUREGRIND baghouse dust collectors by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in 40 CFR Part 60, Appendix A and/or Part 10 of the Michigan Air Pollution Control Rules. An alternate method, or a modification to the approved EPA Method, may be specified in an AQD-approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. The permittee must submit a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1331, R 336.2001, R 336.2003, R 336.2004)**
2. The permittee shall determine the VOC content of the thermoformed stock and laminate stock finished goods from FGPROD®RIND. The permittee shall use sampling and analysis methods approved by the AQD District Supervisor. The samples shall represent the full range of the thermoformed stock and laminate stock finished goods produced. The permittee shall conduct the required sampling and analysis for the full range of products produced in FGPROD®RIND no later than December 15th of each calendar year. The results shall be submitted to the AQD District Supervisor in an acceptable format within 14 days following the receipt of analytical results. **(R 336.1225, R 336.1702(a))**

3. Upon request of the AQD District Supervisor, the permittee shall determine the 1,1 difluoroethane content of the laminate stock finished goods. The permittee shall use sampling and analysis methods approved by the AQD District Supervisor. The samples shall represent the full range finished goods produced.¹ **(R 336.1224, R 336.1225)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall monitor the isopentane usage in EUPRODUCTION with the instrument required in SC III.1 on a continuous basis. **(R 336.1225, R 336.1702(a))**
2. The permittee shall monitor the 1,1 difluoroethane usage in EUPRODUCTION with the instrument required in SC III.2 on a continuous basis.¹ **(R 336.1224, R 336.1225)**
3. The permittee shall monitor and record the pressure drop across each of the dust collectors in EUREGRIND on a daily basis. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1331)**
4. The permittee shall keep records of the isopentane usage in EUPRODUCTION on a daily, monthly, and 12-month rolling time period basis as determined at the end of each calendar month. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**
5. The permittee shall keep records of the 1,1 difluoroethane usage in EUPRODUCTION for each day, month, and 12-month rolling time period as determined at the end of each calendar month. The permittee shall keep all records on file at the facility and make them available to the Department upon request.¹ **(R 336.1224, R 336.1225)**
6. The permittee shall keep production records for EUPRODUCTION on a monthly basis and 12-month rolling time period basis as determined at the end of each calendar month. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1224, R 336.1225, R 336.1702(a))**
7. The permittee shall keep the following records of the isopentane content of the products manufactured at the facility:
 - a) The isopentane content, in percent, of the thermoformed stock at extrusion for each day.
 - b) The isopentane content, in percent, of the thermoformed stock finished goods for each day.
 - c) The isopentane content, in percent, of the laminate stock at extrusion for each day.
 - d) The isopentane content, in percent, of the laminate stock finished goods for each day.
 - e) The average isopentane content, in percent, of the thermoformed stock at extrusion for each month.
 - f) The average isopentane content, in percent, of the thermoformed stock finished goods for each month.
 - g) The average isopentane content, in percent, of the laminate stock at extrusion for each month.
 - h) The average isopentane content, in percent, of the laminate stock finished goods for each month.

The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

8. The permittee shall keep records of the amount of isopentane containing scrap processed in EUREGRIND for each month and 12-month rolling time period as determined at the end of each calendar month. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1225, R 336.1331, R 336.1702(a))**
9. The permittee shall calculate the VOC emission rate from FGPROD®RIND for each month and 12-month rolling time period as determined at the end of each calendar month. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

10. The permittee shall keep the following records of the 1,1 difluoroethane content of the products manufactured at the facility:
- The 1,1 difluoroethane content, in percent, of the laminate stock at extrusion for each day.
 - The 1,1 difluoroethane content, in percent, of the laminate stock finished goods for each day.
 - The average 1,1 difluoroethane content, in percent, of the laminate stock at extrusion for each month.
 - The average 1,1 difluoroethane content, in percent, of the laminate stock finished goods for each month.

The permittee shall keep all records on file at the facility and make them available to the Department upon request.¹ (R 336.1224, R 336.1225)

11. The permittee shall keep records of the amount of 1,1 difluoroethane containing scrap processed in EUREGRIND for each month and 12-month rolling time period as determined at the end of each calendar month. The permittee shall keep all records on file at the facility and make them available to the Department upon request.¹ (R 336.1224, R 336.1225)
12. The permittee shall calculate the 1,1 difluoroethane emission rate from FGPROD®RIND for each month and 12-month rolling time period as determined at the end of each calendar month. The permittee shall keep all records on file at the facility and make them available to the Department upon request.¹ (R 336.1224, R 336.1225)

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter / Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVEXTR1	42	31.4	R 336.1225 40 CFR 52.21 (c) & (d)
2. SVLAM1	21	34.0	R 336.1225 40 CFR 52.21 (c) & (d)
3. SVLAM2	31	33.1	R 336.1225 40 CFR 52.21 (c) & (d)
4. SVLRGBAG	24	37.0	R 336.1225 40 CFR 52.21 (c) & (d)
5. SVSMLBAG	12	36.4	R 336.1225 40 CFR 52.21 (c) & (d)
6. SVRECLAIM	14	36.1	R 336.1225 40 CFR 52.21 (c) & (d)
7. SVGRINDFAN	57 x 57	34.8	R 336.1225 40 CFR 52.21 (c) & (d)
8. SVLAMBAG	10	36.9	R 336.1225 40 CFR 52.21 (c) & (d)
9. SVBROWN3	13	36.4	R 336.1225 40 CFR 52.21 (c) & (d)
10. SVBROWN5	11	35.6	R 336.1225 40 CFR 52.21 (c) & (d)
11. SVEXTR4	31	34	R 336.1225 40 CFR 52.21 (c) & (d)

IX. OTHER REQUIREMENT(S)

NA

Footnotes:

¹ This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

APPENDIX A – Isopentane Usage Calculation

Thermoformer Stock at Extrusion:

Value	Equation Used	Comments
Total pounds of isopentane used	N/A	Pounds of isopentane used to extrude thermoformer foam is collected at the machine every shift.
Pounds of good rolls extruded	N/A	Pounds of good thermoformer roll stock produced is collected at the machine every shift.
Pounds of scrap extruded	N/A	Pounds of thermoformer scrap generated at extrusion is collected at the machine every shift.
Pounds of isopentane in good rolls	$= \frac{(\text{total pounds of isopentane used} * \text{pounds of good rolls extruded})}{(\text{pounds of good rolls extruded} + \text{pounds of scrap extruded})}$	Pounds of Isopentane in the thermoformer roll stock at extrusion.
Pounds of isopentane in scrap (ITSE)	$= \frac{(\text{total pounds of isopentane used} * \text{pounds of scrap extruded})}{(\text{pounds of scrap extruded} + \text{pounds of good rolls extruded})}$	Pounds of Isopentane in the thermoformer scrap at extrusion

Lamination Stock at Extrusion:

Value	Equation Used	Comments
Total pounds of isopentane used	N/A	Pounds of isopentane used to extrude lamination foam is collected at the machine every shift.
Pounds of good rolls extruded	N/A	Pounds of good lamination roll stock produced is collected at the machine every shift.
Pounds of scrap extruded	N/A	Pounds of lamination scrap generated at extrusion is collected at the machine every shift.
Pounds of isopentane in good rolls	$= \frac{(\text{total pounds of isopentane used} * \text{pounds of good rolls extruded})}{(\text{pounds of good rolls extruded} + \text{pounds of scrap extruded})}$	Pounds of Isopentane in the lamination roll stock at extrusion.
Pounds of isopentane in scrap (ILSE)	$= \frac{(\text{total pounds of isopentane used} * \text{pounds of scrap extruded})}{(\text{pounds of scrap extruded} + \text{pounds of good rolls extruded})}$	Pounds of Isopentane in the lamination scrap at extrusion

Thermoformed Finished Goods:

Value	Equation Used	Comments
Pounds of foam used	N/A	Pounds of foam (good rolls) processed at the thermoformers is collected at the machine every shift.
Pounds of web scrap	$= (\% \text{ web scrap for the product} * \text{pounds of foam used})/100$	Pounds of web scrap produced at the thermoformers.
Pounds of finished goods	$= \text{pounds of foam used} - \text{pounds of web scrap}$	Pounds of thermoformed finished goods.
Pounds of isopentane in thermoformer scrap (IST)	$= \text{pounds of web scrap} * \% \text{ of isopentane used to make that foam at extrusion}$	Percent of Isopentane used to make the thermoformer foam is recorded at each extrusion machine.
Pounds of isopentane finished goods	$= \text{pounds of finished goods} * \% \text{ of isopentane used to make that foam at extrusion}$	Percent of Isopentane used to make the thermoformer foam is recorded at each extrusion machine.
Pounds of isopentane from thermoformed finished goods (IETFG)	$= \text{pounds of isopentane in finished goods} * \text{emission factor}$	Pounds of Isopentane from the thermoformed finished goods. The emission factor is obtained from product testing.
Pounds of isopentane in thermoformed finished goods	$= \text{pounds of isopentane in finished goods} - \text{IETFG}$	Amount of Isopentane retained in thermoformed finished goods.

Laminated Finished Goods:

Value	Equation Used	Comments
Pounds of foam used	N/A	Pounds of foam (good rolls) processed at the laminators is collected at the machine every shift.
Pounds of tail scrap	$= \text{tail scrap factor for the product} * \text{pounds of foam used}$	Pounds of tail scrap produced at the laminators.
Pounds of finished goods	$= \text{pounds of foam used} - \text{pounds of tail scrap}$	Pounds of laminated finished goods.
Pounds of isopentane in lamination scrap (ISL)	$= \text{pounds of tail scrap} * \% \text{ of isopentane used to make that foam at extrusion}$	Percent of Isopentane used to make the lamination foam is recorded at each extrusion machine.
Pounds of isopentane finished goods	$= \text{pounds of finished goods} * \% \text{ of isopentane used to make that foam at extrusion}$	Percent of Isopentane used to make the lamination foam is recorded at each extrusion machine.
Pounds of isopentane from laminated finished goods (IELFG)	$= \text{pounds of isopentane in finished goods} * \text{emission factor}$	Pounds of Isopentane from the laminated finished goods. The emission factor is obtained from product testing.

Pounds of isopentane in laminated finished goods	= pounds of isopentane in finished goods - IETLG	Amount of Isopentane retained in laminated finished goods.
--	---	--

APPENDIX B – 1,1 Difluoroethane (152A) Usage Calculation

Thermoformer Stock at Extrusion:

Value	Equation Used	Comments
Total pounds of 152A used	N/A	Pounds of 152A used to extrude thermoformer foam is collected at the machine every shift.
Pounds of good rolls extruded	N/A	Pounds of good thermoformer roll stock produced is collected at the machine every shift.
Pounds of scrap extruded	N/A	Pounds of thermoformer scrap generated at extrusion is collected at the machine every shift.
Pounds of 152A in good rolls	$= \frac{(\text{total pounds of 152A used} * \text{pounds of good rolls extruded})}{(\text{pounds of good rolls extruded} + \text{pounds of scrap extruded})}$	Pounds of 152A in the thermoformer roll stock at extrusion.
Pounds of 152A in scrap (DTSE)	$= \frac{(\text{total pounds of 152A used} * \text{pounds of scrap extruded})}{(\text{pounds of scrap extruded} + \text{pounds of good rolls extruded})}$	Pounds of 152A in the thermoformer scrap at extrusion

Lamination Stock at Extrusion:

Value	Equation Used	Comments
Total pounds of 152A used	N/A	Pounds of 152A used to extrude lamination foam is collected at the machine every shift.
Pounds of good rolls extruded	N/A	Pounds of good lamination roll stock produced is collected at the machine every shift.
Pounds of scrap extruded	N/A	Pounds of lamination scrap generated at extrusion is collected at the machine every shift.
Pounds of 152A in good rolls	$= \frac{(\text{total pounds of 152A used} * \text{pounds of good rolls extruded})}{(\text{pounds of good rolls extruded} + \text{pounds of scrap extruded})}$	Pounds of 152A in the lamination roll stock at extrusion.
Pounds of 152A in scrap (DLSE)	$= \frac{(\text{total pounds of 152A used} * \text{pounds of scrap extruded})}{(\text{pounds of scrap extruded} + \text{pounds of good rolls extruded})}$	Pounds of 152A in the lamination scrap at extrusion

Thermoformed Finished Goods:

Value	Equation Used	Comments
Pounds of foam used	N/A	Pounds of foam (good rolls) processed at the thermoformers is collected at the machine every shift.
Pounds of web scrap	$= (\% \text{ web scrap for the product} * \text{pounds of foam used})/100$	Pounds of web scrap produced at the thermoformers.
Pounds of finished goods	$= \text{pounds of foam used} - \text{pounds of web scrap}$	Pounds of thermoformed finished goods.
Pounds of 152A in thermoformer scrap (DST)	$= \text{pounds of web scrap} * \% \text{ of 152A used to make that foam at extrusion}$	Percent of 152A used to make the thermoformer foam is recorded at each extrusion machine.
Pounds of 152A finished goods	$= \text{pounds of finished goods} * \% \text{ of 152A used to make that foam at extrusion}$	Percent of 152A used to make the thermoformer foam is recorded at each extrusion machine.
Pounds of 152A from thermoformed finished goods (DETFG)	$= \text{pounds of 152A in finished goods} * \text{emission factor}$	Pounds of 152A from the thermoformed finished goods. The emission factor is obtained from product testing.
Pounds of 152A in thermoformed finished goods	$= \text{pounds of 152A in finished goods} - \text{DETFG}$	Amount of 152A retained in thermoformed finished goods.

Laminated Finished Goods:

Value	Equation Used	Comments
Pounds of foam used	N/A	Pounds of foam (good rolls) processed at the laminators is collected at the machine every shift.
Pounds of tail scrap	$= \text{tail scrap factor for the product} * \text{pounds of foam used}$	Pounds of tail scrap produced at the laminators.
Pounds of finished goods	$= \text{pounds of foam used} - \text{pounds of tail scrap}$	Pounds of laminated finished goods.
Pounds of 152A in lamination scrap (DSL)	$= \text{pounds of tail scrap} * \% \text{ of 152A used to make that foam at extrusion}$	Percent of 152A used to make the laminator foam is recorded at each extrusion machine.
Pounds of 152A finished goods	$= \text{pounds of finished goods} * \% \text{ of 152A used to make that foam at extrusion}$	Percent of 152A used to make the laminator foam is recorded at each extrusion machine.
Pounds of 152A from laminated finished goods (DELFG)	$= \text{pounds of 152A in finished goods} * \text{emission factor}$	Pounds of 152A from the laminated finished goods. The emission factor is obtained from product testing.
Pounds of 152A in laminated finished goods	$= \text{pounds of 152A in finished goods} - \text{DELFG}$	Amount of 152A retained in laminated finished goods.