SAFETY DATA SHEET
Flutec PP1

SECTION 1: IDENTIFICATION

1.1. Product identifier:

Trade name: Flutec PP1
Other names / Synonyms: Perfluoro-2-methylpentane
Product no.: 9554, 9554-B, 9554-2.2, 9554-12, 9554-50, 9554-750
Other means of identification: CAS No.: 355-04-4

1.2. Relevant identified uses of the substance or mixture and uses advised against:

▼Relevant identified uses of the substance or mixture: Leak Testing, Immersion Cooling, and Heat Transfer Applications.
Restricted to professional and industrial use.
Uses advised against : None known.

1.3. Details of the supplier of the safety data sheet:

Company and address:
TMC Industries, Inc.
1423 Mill Lane
Waconia, Minnesota 55387
USA
TF: +1 (800) 772-8179
www.tmcindustries.com

Manufacturer:
F2 Chemicals, Ltd.
Lea Lane
Lea Town
PR4 0RX Preston
United Kingdom
www.f2chemicals.com

Distributor:
TMC Industries, Inc.
1423 Mill Lane
Waconia, Minnesota 55387
USA
TF: +1 (800) 772-8179
www.tmcindustries.com

Contact person: Nick Hansen
E-mail: sales@tmcindustries.com
SDS date: 8/11/2026
SDS Version: 3.0
Date of previous version: 12/17/2024 (2.0)

1.4. ▼Emergency telephone number:

VeolocityEHS 1-800-255-3924 within the US, Canada, Puerto Rico and the U.S. Virgin Islands. If outside those areas, call 1-813-248-0585 (Contract#: MIS8157133).

SECTION 2: HAZARD(S) IDENTIFICATION

2.1. Classification of the substance or mixture:

Not classified according to HCS (29 CFR 1910.1200)

2.2. Label elements:

Hazard pictogram(s): Not applicable.
Signal word: Not applicable.
Hazard statement(s):
Precautionary statement(s):
▼General: Not applicable.
▼Prevention: Not applicable.
▼Response: Not applicable.
▼Storage: Not applicable.
Disposal: Refer to manufacturer or supplier for information on recovery or recycling. (P502)

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances:

Product/substance	Identifiers	% w/w	Classification	Note
1,1,1,2,2,3,3,4,5,5,5-undecafluoro-4-(trifluoromethyl)pentane	CAS No.: 355-04-4	100%		

3.2. Mixtures:

Not applicable. This product is a substance.

Where the concentration of an ingredient is expressed as a range the exact concentration has been withheld as a trade secret.

See full text of H-phrases in section 16. Occupational exposure limits are listed in section 8, if these are available.

Other information:

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SECTION 4: FIRST-AID MEASURES

4.1. ▼Description of first aid measures:

General information: If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 911 and give immediate treatment (first aid).
Contact a doctor if in doubt about the injured person's condition or if the symptoms persist. Never give an unconscious person water or other drink.

▼Inhalation: Upon breathing difficulties or irritation of the respiratory tract: Bring the person into fresh air and stay with him/her.

▼Skin contact: Remove contaminated clothing and shoes immediately. Ensure to wash exposed skin thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

▼Eye contact: If in eyes: Flush eyes with water or saline water (20-30 °C) for at least 5 minutes. Remove contact lenses. Seek medical assistance and continue flushing during transport.

▼Ingestion: If the person is conscious, rinse the mouth with water and stay with the person. Never give the person anything to drink.
In case of malaise, seek medical advice immediately and bring the safety data sheet or label from the product. Do not induce vomiting, unless recommended by the doctor.

Have the person lean forward with head down to avoid inhalation of or choking on vomited material.

Burns: Not applicable.

4.2. Most important symptoms and effects, both acute and delayed:
None known.

4.3. Indication of any immediate medical attention and special treatment needed:
Treat symptomatically.

Information to medics:
Bring this safety data sheet or the label from this product.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing media:
Suitable extinguishing media: Alcohol-resistant foam, carbon dioxide, powder, water mist.
Unsuitable extinguishing media: Waterjets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture:
Fire will result in dense smoke. Exposure to combustion products may harm your health. Closed containers, which are exposed to fire, should be cooled with water. Do not allow fire-extinguishing water to enter the sewage system and nearby surface waters.
If the product is exposed to high temperatures, e.g. in the event of fire, dangerous decomposition compounds are produced. These are:
Halogenated compounds
Carbon oxides (CO / CO2)

5.3. Advice for firefighters:
No specific requirements.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:
Contaminated areas may be slippery.

6.2. Environmental precautions:
Avoid discharge to lakes, streams, sewers, etc.
Keep unauthorized persons away from the spill

6.3. Methods and material for containment and cleaning up:
Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.
Wherever possible cleaning should be performed with normal cleaning agents. Avoid use of solvents.

6.4. Reference to other sections:
See section 13 “Disposal considerations” on handling of waste.
See section 8 "Exposure controls/personal protection" for protective measures.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling:
Smoking, drinking and consumption of food is not allowed in the work area.
See section 8 "Exposure controls/personal protection" for information on personal protection.

7.2. ▼Conditions for safe storage, including any incompatibilities:

Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage material: Glass Container
Metal Container.

Storage conditions: Keep container closed when not in use

Incompatible materials: None.

7.3. Specific end use(s):

This product should only be used for applications quoted in section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

No substances are listed with a permissible exposure limit (ref: 29 CFR 1910.1000 TABLE Z-1)
No substances are listed with a permissible exposure limit CIB 66 [NIOSH 2014-100]

8.2. ▼Exposure controls:

Apply general control to prevent unnecessary exposure

General recommendations: Smoking, drinking and consumption of food is not allowed in the work area.

Exposure scenarios: There are no exposure scenarios implemented for this product.

Exposure limits: Occupational exposure limits have not been defined for the substances in this product.

Appropriate technical measures: Apply standard precautions during use of the product. Avoid inhalation of vapours.

▼Hygiene measures: In between use of the product and at the end of the working day all exposed areas of the body must be washed thoroughly. Pay special attention to hands, forearms and face.

Measures to avoid environmental exposure: No specific requirements.

Individual protection measures, such as personal protective equipment:

Generally: Use only protective equipment with a recognized certification mark, e.g. the UL mark.

Respiratory Equipment:

Type	Class	Colour	Standards	
No specific requirements				

Skin protection:

Recommended	Type/Category	Standards	
No specific requirements.	-	-	

Hand protection:

Material	Glove thickness (mm)	Breakthrough time (min.)	Standards	
No specific requirements	-	-	-	

Eye protection:

Type	Standards	
No specific requirements	-	

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties:

Physical state:	Liquid
Color:	Colorless
Odor:	None
Odor threshold (ppm):	No data available
pH:	Not applicable
Density (g/cm^3):	1.7179
Relative density:	1.718
Kinematic viscosity:	0.42 mm^2/s
Dynamic viscosity:	0.73 mPa.s
Particle characteristics:	No data available

Phase changes:

Melting point/freezing point (°F):	-
Melting point/freezing point (°C):	-90
Softening point/range (°F):	Does not apply to liquids.
Boiling point (°F):	-
Boiling point (°C):	57
Vapor pressure:	27 kPa
Relative vapor density:	0.01 g/ml
Decomposition temperature (°F):	No data available
Decomposition temperature (°C):	400

Data on fire and explosion hazards:

Flash point (°F):	No data available
Flammability (°F):	Not applicable
Auto-ignition temperature (°F):	Not applicable
Explosion limits (% v/v):	No data available

Solubility:

Solubility in water:	Insoluble
n-octanol/water coefficient (LogKow):	No data available
Solubility in fat (g/L):	Not applicable - product is a liquid

9.2. Other information:

Thermal stability:	Stable under normal conditions.
Evaporation rate (n-butylacetate = 100):	No data available
Other physical and chemical parameters:	No data available.
Refractive Index:	1.2564
Surface tension (mN/m):	11.91
Molecular Weight (g/mol):	338
Oxidizing properties:	No data available

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity:
No data available.

10.2. Chemical stability:
The product is stable under the conditions, noted in section 7 “Handling and storage”.

10.3. Possibility of hazardous reactions, including those associated with foreseeable emergencies:
None known.

10.4. Conditions to avoid:
None Known

10.5. Incompatible materials:
None.

10.6. ▼Hazardous decomposition products:
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects:

Acute toxicity:
Based on available data, the classification criteria are not met.

Skin corrosion/irritation:
Based on available data, the classification criteria are not met.

Serious eye damage/irritation:
Based on available data, the classification criteria are not met.

Respiratory sensitisation:
Based on available data, the classification criteria are not met.

Skin sensitisation:
Based on available data, the classification criteria are not met.

Germ cell mutagenicity:
Based on available data, the classification criteria are not met.

Carcinogenicity:
Based on available data, the classification criteria are not met.

Reproductive toxicity:
Based on available data, the classification criteria are not met.

STOT-single exposure:
Based on available data, the classification criteria are not met.

STOT-repeated exposure:
Based on available data, the classification criteria are not met.

Aspiration hazard:
Based on available data, the classification criteria are not met.

Long term effects:
None known.

Other information:
None known.

SECTION 12: ECOLOGICAL INFORMATION

12.1. ▼Toxicity:
Based on available data, the classification criteria are not met.

12.2. Persistence and degradability:
Based on available data, the classification criteria are not met.

12.3. Bioaccumulative potential:
Based on available data, the classification criteria are not met.

12.4. Mobility in soil:
No data available.

12.5. Results of PBT and vPvB assessment:
This mixture/product does not contain any substances known to fulfil the criteria for PBT and vPvB classification.

12.6. Other adverse effects:
None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods:
This material can be reclaimed by the manufacturer if required or disposed of at an approved facility according to local regulations.

RCRA Hazardous waste ("P" and "U" list) (40 CFR 261):
None of the components are listed

Specific labelling:

Contaminated packing:
Packaging containing residues of the product must be disposed of similarly to the product.

SECTION 14: TRANSPORT INFORMATION

	14.1 UN / ID ***	14.2 UN proper shipping name	14.3 Hazard class(es)	14.4 PG*	14.5 Env**	Other information:
DOT	-	-	-	-	-	-
IMDG	-	-	-	-	-	-
IATA	-	-	-	-	-	-

* Packing group
** Environmental hazards
*** UN number or ID number

▼Additional information:
Not dangerous goods according to ADR/ADN/RID, IATA and IMDG.

14.6. Special precautions for user:

Not applicable.

14.7. Transport in bulk according to IMO instruments:
No data available.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:

Product registration number:
01-2120041904-59

15.2. ▼U.S. Federal regulations:

▼TSCA (the non-confidential portion):	1,1,1,2,2,3,3,4,5,5,5-undecafluoro-4-(trifluoromethyl)pentane is listed
Clean Air Act:	None of the components are listed
EPCRA Section 302:	None of the components are listed
EPCRA Section 304:	None of the components are listed
EPCRA section 313:	None of the components are listed
CERCLA:	None of the components are listed
Hazardous chemical inventory reporting:	

15.3. State regulations:

California / Prop. 65:	None of the components are listed
Massachusetts / Right To Know Act:	None of the components are listed
New Jersey / Right To Know Act:	None of the components are listed
New York / Right To Know Act:	None of the components are listed
Pennsylvania / Right To Know Act:	None of the components are listed

15.4. Restrictions for application:
Restricted to professional users.

15.5. Demands for specific education:
No specific requirements.

15.6. Additional information:
Not applicable.

15.7. Chemical safety assessment:
No

15.8. Sources:
OSHA Hazard Communication Standard (29 CFR 1910.1200)

SECTION 16: OTHER INFORMATION

The full text of identified uses as mentioned in section 1:
None known.

Abbreviations and acronyms:

ACGIH = American Conference of Governmental Industrial Hygienists
ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS = Chemical Abstracts Service
CERCLA = Comprehensive Environmental Response Compensation and Liability Act
DOT = Department of Transportation
EINECS = European Inventory of Existing Commercial chemical Substances
EPCRA = Emergency Planning and Community Right-To-Know Act
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
HCIS = Hazardous Chemical Information System
HNOC = Hazards Not Otherwise Classified
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IMDG = International Maritime Dangerous Goods
LogKow = logarithm of the n-octanol/water coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NFPA = National Fire Protection Association
NIOSH = National Institute for Occupational Safety and Health
OECD = Organisation for Economic Co-operation and Development
OSHA = Occupational Safety and Health Administration
PBT = Persistent, Bioaccumulative and Toxic
RCRA = Resource Conservation and Recovery Act
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SARA = Superfund Amendments and Reauthorization Act
SCL = A specific concentration limit.
STEL = Short-term exposure limits
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
STOT-SE = Specific Target Organ Toxicity - Single Exposure
TSCA = The Toxic Substances Control Act
TWA = Time weighted average
UN = United Nations
UVCB = Unknown or variable composition, complex reaction products or of biological materials
VOC = Volatile Organic Compound
vPvB = Very Persistent and Very Bioaccumulative

▼Additional information:

Not applicable.

The safety data sheet is validated by:

TMC Industries - QC Department

Other:

A change (in proportion to the last essential change (first cipher in SDS version, see section 1)) is marked with a triangle.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
Country-language: US-en