

# 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 users.  
**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 ORX 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:** 12/17/2024  
**SDS Version:** 2.0  
**Date of previous version:** 12/17/2024 (2.0)

#### 1.4. Emergency telephone number:

(800) 424-9300 - CHEMTREC 24-HR Emergency USA, Canada, Puerto Rico, US Virgin Islands.

### 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:** -  
**Prevention:** -  
**Response:** -  
**Storage:** -  
**Disposal:** Refer to manufacturer or supplier for information on recovery or recycling. (P502)  
**Additional labelling:** Not applicable.

### 2.3. Other hazards:

## 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:

-

## 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:** In case of discomfort: bring the person into fresh air.

**Skin contact:** Upon irritation: rinse with water. In the event of continued irritation, seek medical assistance.

**Eye contact:** Rinse gently with lukewarm water. Remove any contact lenses if this is easy to do. Continue rinsing. In case of persistent eye irritation or discomfort: Seek medical help.

**Ingestion:** Rinse and flush mouth thoroughly and consume large quantities of water. In case of continued discomfort: seek medical assistance and bring this safety data sheet.

**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 / CO<sub>2</sub>)

**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:**

**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)

### 8.2. Exposure controls:

Apply general control to prevent unnecessary exposure

<b>General recommendations:</b>	Smoking, drinking and consumption of food is not allowed in the work area.
<b>Exposure scenarios:</b>	There are no exposure scenarios implemented for this product.
<b>Exposure limits:</b>	Occupational exposure limits have not been defined for the substances in this product.
<b>Appropriate technical measures:</b>	Apply standard precautions during use of the product. Avoid inhalation of vapours.
<b>Hygiene measures:</b>	Wash hands after use.
<b>Measures to avoid environmental exposure:</b>	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:

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

### Phase changes:

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

### Data on fire and explosion hazards:

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

### Solubility:

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

### 9.2. Other information:

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

No data available.

#### **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 TMC Industries. Contact TMC for more information.

**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 informatio n:
DOT	-	-	-	-	-	-
IMDG	-	-	-	-	-	-
IATA	-	-	-	-	-	-

\* Packing group

\*\* Environmental hazards

**Additional information:**

Not dangerous goods according to ADR, 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):** None of the components are listed

**Clean Air Act:** None of the components are listed

<b>EPCRA Section 302:</b>	None of the components are listed
<b>EPCRA Section 304:</b>	None of the components are listed
<b>EPCRA section 313:</b>	None of the components are listed
<b>CERCLA:</b>	None of the components are listed
<b>Hazardous chemical inventory reporting:</b>	This product is not subject to Tier II reporting.

#### State regulations:

<b>California / Prop. 65:</b>	None of the components are listed
<b>Massachusetts / Right To Know Act:</b>	None of the components are listed
<b>New Jersey / Right To Know Act:</b>	None of the components are listed
<b>New York / Right To Know Act:</b>	None of the components are listed
<b>Pennsylvania / Right To Know Act:</b>	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  
 LogPow = logarithm of the octanol/water partition 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  
UVBC = Unknown or variable composition, complex reaction products or of biological materials  
VOC = Volatile Organic Compound  
vPvB = Very Persistent and Very Bioaccumulative

**Additional information:**

In accordance with HCS (29 CFR 1910.1200(g)), a safety data sheet is not required for this product. This safety data sheet has been created on a voluntary basis to distribute relevant information.

**The safety data sheet is validated by:**

TMC Industries, Inc. - 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