November 12, 2021

Re: Study Submission for 1,2-Trans-Dichloroethylene (CASRN 156-60-5): Health and Safety Data Reporting; Addition of 20 High-Priority Substances and 30 Organohalogen Flame Retardants; Docket No. EPA-HQ-OPPT-2020-0474

Chemical Name and CAS Number

1,2-Trans-Dichloroethylene (CASRN 156-60-5)

Submitting Official

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Impurities or Additives Known to Have Been Present but Not Noted in Study

None

Additional Information

None

3 Electronics Markets Materials Division

Subject: Glove Permeation Data Provided by Best Glove Corporation

The attached tables contain permeation results for Novec ™ Engineered Fluids, HFE-7100, HFE-7200, HFE-71DE and pure trans-1,2, dichloroethylene. The testing was performed by Best Glove Analytical Laboratory on various elastomers available from Best Glove. The data includes material of construction, elastomer thickness, the minimum detection limit of the equipment, the time it took for the solvents to be detected through the glove (breakthrough time), and the approximate rate of permeation.

Glove thickness is a critical value when evaluating which glove to use. For example, the test results show that a 15 mil Nitrile glove will resist HFE-71DE for 11 minutes. A double layer of 15 mil nitrile gloves can be expected to last approximately 22 minutes. Multiple layers may cause problem as the solvent may permeate through the first layer during immersion, become trapped between layers, then continue through the second layer after the person has removed their hands from the solvent. Multiple layers of the same glove should be used with caution. Multiple layers can be used where the individual gloves provide different protection. An example of this would be a Nitrile glove over a laminate (PE/EVAL) glove, where the Nitrile gloves both protect and help with the dexterity problems of the laminate glove. This system is typically uncomfortable and not readily accepted by employees, but works well to prevent skin contact.

This data can be used to determine which elastomer is the best for a particular application. It also can be used to determine how long a particular glove may last if the ultimate solution is not readily available. It is recommended that the gloves be discarded after use (chemical contact) time equals breakthrough time. Consider cost, performance, and operator acceptance when choosing a glove.

Permeation Testing of 50/50 Blend of 1,2-trans Dichloroethylene and Hydrofluoroether (HFE-71DE)

Glove Style Tested	Description of Glove	Minimum Detectable Limit	Breakthrough Time in Minutes Limit	Permeation Rate in ug/cm2/min
1. Best Viton II 890	30 mil Viton/Butyl glove	0.02 ppm	44 minutes	4
2. Best Chloroflex 723	28 mil Neoprene glove	0.02 ppm	NT	NT
3. Best Nitri Solve 730	15 mil Nitrile glove (flock-lined)	0.02 ppm	11 minutes	4
4. Best Butyl 874	14 mil Butyl glove	0.02 ppm	11 minutes	772
5. Best Nitri Solve 727	15 mil Nitrile glove (unlined)	0.02 ppm	24 minutes	74
6. Best Viton II 892	12 mil Viton/Butyl glove	0.02 ppm	11 minutes	1193

NOTE: NT = Glove not tested for permeation with this solution.

Permeation Testing of 1,2-trans Dichloroethylene

Glove Style Tested	Description of Glove	Minimum Detectable Limit	Breakthrough Time in Minutes	Permeation Rate in ug/cm2/min
1. Best Viton II 890	30 mil Viton/Butyl glove	0.02 ppm	238 minutes	66
2. Best Chloroflex 723	28 mil Neoprene glove	0.02 ppm	6 minutes	671
3. Best Nitri Solve 730	15 mil Nitrile glove	0.02 ppm	8 minutes	552
4. Best Butyl 874	14 mil Butyl glove	0.02 ppm	6 minutes	808

Permeation Testing of HFE-7100

Glove Style Tested	Description of Glove	Minimum Detectable Limit	Breakthrough Time in Minutes	Permeation Rate in ug/cm2/min
1. Best Viton II 892	12 mil Viton/Butyl glove	0.02 ppm	>480 minutes	ND
2. Best UltraFlex 32	supported Neoprene glove	0.02 ppm	>480 minutes	ND
3. Best Nitri Solve 730	15 mil Nitrile glove	0.02 ppm	>480 minutes	ND
4. Best N-Dex 8005	8 mil disposable Nitrile glove	0.02 ppm	>480 minutes	ND
5. Best Butyl 874	14 mil Butyl glove	0.02 ppm	>480 minutes	ND

Permeation Testing of HFE-7200

Glove Style Tested	Description of Glove	Minimum Detectable	Breakthrough Time in Minutes Limit	Permeation Rate in ug/cm2/min
1. Best Viton II 892	12 mil Viton/Butyl glove	0.02 ppm	>480 minutes	ND
2. Best UltraFlex 32	supported Neoprene glove	0.02 ppm	>480 minutes	ND
3. Best Nitri Solve 730	15 mil Nitrile glove	0.02 ppm	>480 minutes	ND
4. Best N-Dex 8005	8 mil disposable Nitrile glove	0.02 ppm	>480 minutes	ND
5. Best Butyl 874	14 mil Butyl glove	0.02 ppm	>480 minutes	ND

NOTE: ND = None Detected