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TCE (TRICHLOROETHYLENE) AND PERCHLOROETHYLENE: NEW AND UNNECESSARY EXPOSURE PROBLEMS IN EMBALMING ROOMS.

Part 2

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ALTERNATIVES: Fortunately, there is no need at all to use TCE or PERC as a drywash/cleaning solvent in the embalming room. There are acceptable and effective substitute solvents that can be used in place of the undesirable chlorinated ones such as TCE. An example is Champion's new cleaning solvent which is acetone/multi-alcoholic based. These solvents are virtually as effective as TCE-type solvents and can be easily used in place of them. They present no new exposure dangers than already exist in embalming rooms. Tissue builders and nail polish removers contain similar types of solvents and are already in wide use in embalming rooms. Consequently, the complexity of chemical exposure in the embalming room is not increased.

The chemicals that are in the new non-TCE based solvents are all rated as non-carcinogenic by various Federal and international agencies and watch groups. They present no exceptional disposal or use problems in regards to EPA regulations. Consequently, there is a minimum liability involved in the storing and usage of them as compared to TCE solvents. The only disadvantage is that they are classified and shipped as flammables. However, numerous flammable chemicals are already present in the embalming room, so this would add no additional burden of safety and handling. Vapor pressures for the non-TCE solvent and the TCE solvent are similar, consequently, both will very readily evaporate after use.

CONCLUSION: TCE or PERC, in my opinion, is a bad choice for a replacement drywash/cleaning solvent in embalming rooms. There are excellent acceptable alternatives that accomplish all the tasks required for a cleaning solvent in the embalming room and funeral home. The liabilities associated with use and disposal (as per EPA regulations and guidelines) in addition to the exposure potential and possible carcinogenicity of TCE and related chlorinated solvents (i.e. PERC) should be justification for eliminating the usage and storage of TCE based solvents in a workplace environment such as the embalming room. Eliminate the use of TCE or PERC solvents in the embalming room and replace them with the available alternatives, the evidence, in my opinion, is strongly in favor of the alternative non-TCE/non-PERC type solvents.

REFERENCES: The literature on TCE and PERC is extensive, following are selected current references.

Trichloroethylene., IARC, Vol. 63, p. 75 (1995) updated commentary (2000).

Bull, R.J., Mode of Action of Liver Tumor Induction by Trichloroethylene and it's Metabolites, Trichloroacetate and Dichloroacetate., Environ Health Persp., Vol. 108 (Suppl 2), May 2000.

Johnson, P.D., et.al., A Review: Trichloroethylene Metabolites: Potential Cardiac Teratogens., Environ Health Persp., Vol. 106 (Suppl 4), Aug 1998.

Trichloroethylene, National Cancer Institute, National Institute of Health Status Report 1997 (update Aug 2000)., Washington, D.C..

Trichloroethylene, International Chemical Safety Card Database, Center for Disease Control, NIOSH, Mar 1999., Washington, D.C..

Trichloroethylene., Environmental Defense Fund Scorecard, 1999 (update Aug 2000)., New York, N.Y..

Trichloroethylene., NTP Chemical Repository, Informational Database., NIEHS., National Institute of Health., initial report Aug 1991 (update 2000)., Washington, D.C..

Drinking Water and Health (Factsheet - Trichloroethylene)., Office of Ground and Drinking Water , EPA., Rev. Dec. 1998., Washington, D.C..

Trichloroethylene., Office of Air Quality Planning and Standards., EPA., revised Nov 1999., Washington, D.C..

Toxicological Profile for Trichloroethylene., Agency for Toxic Substances and Disease Registry (ATSDR)., U.S. Public Health Service, U.S. Dept. of Health and Human Services, Atlanta, Ga., 1993 (update 2000).

Trichloroethylene., U.S. Environmental Protection Agency., Integrated Risk Information System (IRIS)., Environmental Criteria and Assessment Office, Office of Research and Development, Cincinnati, OH., 1993 (update 1999).

Trichloroethylene., Ninth Report on Carcinogens, NTP (1999)., Public Health Service, Dept. Health and Human Services., Atlanta, GA..

Scott-Siegel, C., et.al., Trichloroethylene Health Risks — State of the Science., Environ Health Persp., Vol. 108 (Suppl 2), May 2000.

Phytoremediation of trichloroethylene with hybrid poplar., Phytoremediation of soil and water contaminants., ACS Symposium Series 664., American Chemical Society, 1996., Washington, D.C..

Dugard, P.H., Effects of trichloroethylene (TCE) on an in vitro chick atrioventricular canal culture., Toxicol Sci: Vol. 56 ISS 2, 2000, p 437-8.

Poet, T.S., et.al., Assessment of the percutaneous absorption of trichloroethylene in rats and humans using MS/MS real-time breath analysis and physiologically based pharmacokinetic modeling, Toxicol Sci; Vol. 56, ISS 1, 2000, p. 61-72.

Wu, C., Schaum, J., Exposure assessment of trichloroethylene., *Environ Health Perspect*; Vol. 108 (Suppl 2), 2000, p. 369-63.

Rhomberg, LR., Dose-response analysis of the carcinogenic effects of trichloroethylene in experimental animals., *Environ Health Perspect*; Vol. 108 (Suppl 2), 2000., p. 343-58.

Boyes, WK., et.al., Neurotoxic and pharmacokinetic responses to trichloroethylene as a function of exposure scenario., *Environ Health Perspect*; Vol 108 (Suppl 2), 2000, p. 317-22.

Vamvakas, S., Renal cell cancer correlated with occupational exposure to trichloroethylene., *J Cancer Res Clin Oncol* 2000 Mar; 126 (3): 178-80.

Hayashi, N., et.al., Eosinophilic fasciitis following exposure to trichloroethylene: successful treatment with cyclosporin., *Br J Dermatol* 2000 Apr; 142 (4): 830-2.

Dephon, B., et.al., Tetrachloroethylene and trichloroethylene fatality: case report and simple headspace SPME - capillary gas chromatographic determination in tissues., *J Anal Toxicol* 2000 Jan-Feb; 24 (1): 22-6.

Boyer, AS., et.al., Trichloroethylene inhibits development of embryonic heart valve precursors in vitro., *Toxicol Sci* 2000 Jan; 53 (1): 109-17.

Kostopoulou, MN., et. al., Volatile organic compounds in the surface water of northern Greece., *Chemosphere* 2000 Mar; 40 (5): 527-32.

Griffin, JM., et.al., Trichloroethylene accelerates an autoimmune response by Th1 T-cell activation in MRL+/+ mice., *Immunopharmacology* 2000 Feb; 46 (2): 123-7.

Perchloroethylene., *Environmental Defense Fund Scorecard, 1999 (update 2000).*, New York, N.Y.

Perchloroethylene., *NTP Chemical Repository, Information Database.*, NIEHS., National Institute of Health., 1993 (update 2000)., Washington, D.C..

Perchloroethylene., *National Cancer Institute, National Institute of Health Status Report, updated version Aug 2000.*, Washington, D.C.

Drinking Water and Health (Factsheet - Perchloroethylene)., Office of Ground and Drinking Water, EPA, current edition (1999)., Washington, D.C..

Perchloroethylene., *Ninth Report on Carcinogens, NTP (1999).*, Public Health Services, Dept. Health and Human Services., Atlanta, GA..

Parsons, F., et.al., Transformations of tetrachloroethene and trichloroethene in microcosms and groundwater., *J Am Water Works Assoc*, Feb. 1984: 56-59.

Chemicals in the Environment: Perchloroethylene., Office of Pollution Prevention and Toxics. U.S. Environmental Protection Agency., Aug 1994., Washington, D.C..

Toxicological Profile for Perchloroethylene., Agency for Toxic Substances and Disease Registry (ATSDR)., U.S. Public Health Service, U.S.Dept of Health and Human Services, Atlanta, Ga., 1996 (update 2000).

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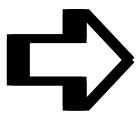
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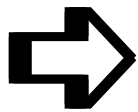
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