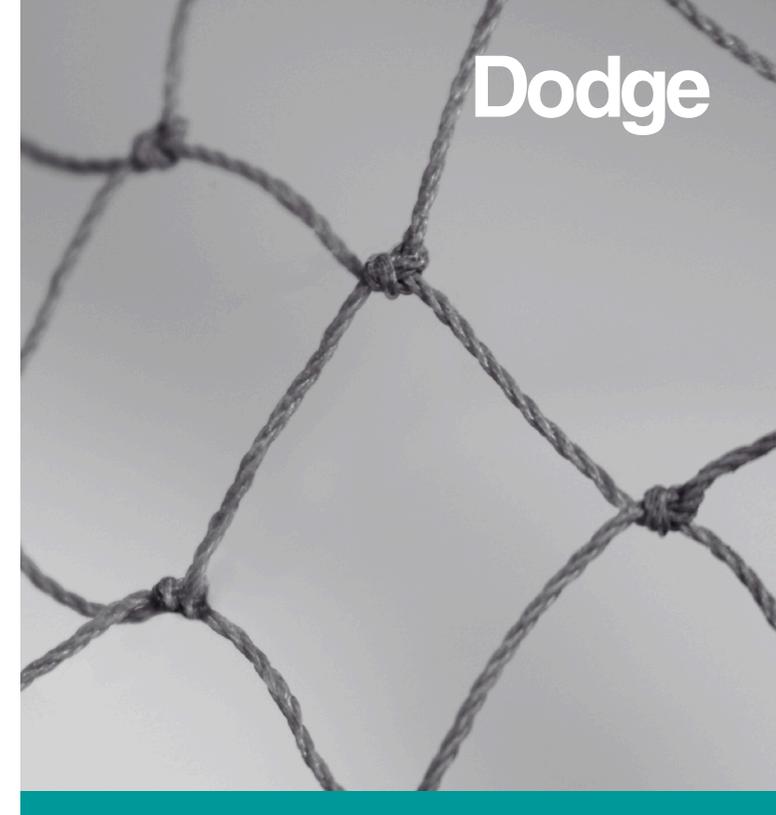


Dodge



Reprinted from the *Dodge Magazine*, Fall 2012

## Co-Injections: Inexpensive Insurance Against Unpleasant Surprises

by Himayun "Sam" Mirza

**R**ectifiant is a multifunctional chemical from The Dodge Company and has a long proven efficacy record in the embalming industry. Primarily developed as a water corrective chemical, Rectifiant has been successful in aiding in the embalming of a wide variety of difficult cases. At a glance, Dodge Rectifiant keeps the embalming

### Published by

The Dodge Company  
9 Progress Road  
Billerica, MA 01821-5731  
Phone: 1-978-600-2099  
For Orders: 1-800-443-6343  
Fax: 1-978-600-2333/  
1-800-443-4034

The Dodge Company (Canada)  
1265 Fewster Drive, Mississauga  
Ontario, L4W 1A2  
Phone: 1-905-625-0311  
For Orders: 1-800-263-0862  
Fax: 1-905-624-1109

The Dodge Company  
Unit 15 Ardglan Industrial Estate  
Whitchurch Hampshire RG287BB  
United Kingdom  
Phone: (011-44) 1256-893883  
Fax: (011-44) 1256-893868



Website: [www.dodgeco.com](http://www.dodgeco.com)  
Web Store: [shop.dodgeco.com](http://shop.dodgeco.com)  
E-mail: [dodgemag@dodgeco.com](mailto:dodgemag@dodgeco.com)

© 2016 The Dodge Company, Printed in U.S.A.

The opinions expressed by contributors to this magazine are those of the authors and do not necessarily represent the opinion of the publisher.

mixture free from insoluble precipitation buildup in the embalming machine tank and lines. It also enhances overall performance and embalming results by removing

**No fluid can work if it fails to make intimate contact with the tissue to be preserved. The main function of co-injection chemicals is to promote penetration and perfusion to produce a uniform and thorough preservation.**

metallic salts and ions from the embalming solution and the body. Co-injection chemicals like Rectifiant perform their functions reliably and are useful for what they can prevent. They are like an inexpensive insurance against unpleasant surprises.

With the advances in medical science and health care, there is a tendency for people afflicted with serious illnesses to live for longer periods of time. At death, often the bodies are older and have been subjected to long multi-drug treatments, including radiation and chemotherapy. These treatments can result in heart diseases, jaundice, blockages of arteries, renal failure, and poor

circulation, to name a few.

Rectifiant works by counteracting the hard water conditions, neutralizing water purifying chemicals, minerals, gases, and heavy metal ions which interfere with the embalming success. It also acts as buffer to maintain the pH of embalming fluid at its optimum working level and dissolve the calcium barrier defenses of bacteria to enhance the antimicrobial activity of embalming solutions.

In addition to water softening and keeping the system clean and at optimum pH and performance level, Rectifiant has the following functions as a co-injection:

- Conditioning the circulatory system.
- Treating specific conditions such as circulatory blockages, discoloration, post-mortem and jaundice discoloration, and radiation therapy.

A major factor in the success of any embalming procedure is penetration of the fluid into the circulatory system and perfusion of it into the tissues. No fluid can work if it fails to make intimate contact with the tissue to be preserved. The main function of co-injection

chemicals is to promote penetration and perfusion to produce a uniform and thorough preservation.

### Conditioning the Circulatory System

At death, blood circulation stops and it begins to coagulate in the vessels. The blood deposition in the tissues causes post-mortem stain. For the embalming process to be successful, the fluid must flow freely through all vessels to reach the tissues. The clotting of blood is a cascading enzyme process mediated

**Surface-active agents, or surfactants, serve to lower the surface tension of the fluid to allow it to more thoroughly penetrate tissues.**

by calcium. Simply put, the presence of calcium promotes blood coagulation and clotting. If you want to stop this process, you need to tie up and remove free calcium from both the embalming fluid and the body fluids. A co-injection chemical such as Rectifiant contains chelating agents to do this adequately and reliably. While many fluids are formulated to contain some water softening

capacity, even moderately hard water will need treatment with additional chemical added as a co-injection in the fluid mixture.

Another part of vascular conditioning is the breakup and fluidization of coagulated blood and clots. Co-injection chemicals are formulated to help dissolve clots and conditions tissues to permit better perfusion of fluid into the cells. The co-injection products often contain a blend of surface-active agents and solvents to accomplish these functions. Surface-active agents, or surfactants, serve to lower the surface tension of the fluid to allow it to more thoroughly penetrate tissues. The solvents used are chosen for their ability to disrupt the bonding forces that hold blood proteins together.

### Treatment of Specific Conditions

Discolored or mildly jaundiced bodies are some of the more challenging cases for the embalmer and certain embalming fluids are better at treating these conditions than are others. A co-injection chemical formulated for the treatment of jaundice or discoloration should be able to bleach the bulk of bile or blood remaining in the tissues. At the very least, a co-injection chemical should

be able to promote perfusion to allow the staining agent to move out of the tissue. Rectifiant will tie up metal ions in the body fluids that can cause staining while breaking up clots and coagulated blood in the interstitial fluid.

A co-injection chemical is developed to address problems embalmers encounter in their practice. They would never have gained acceptance in the embalming field if they didn't work. The co-injection chemicals used today provide the embalmer with the tools needed to achieve excellent results. The positive effects of a co-injection chemical may not always be obvious, but they are cheap insurance in preventing the unforeseen problems that can plague that "typical" case.

*I'd like to thank my colleague, Rick Daly, Research Chemist at Dodge and my ex-colleague, Mark DeBenedetto, PhD for their help on this article.*



Sam has a master's degree in chemistry and started his professional career as a lecturer in Physical Chemistry in Pakistan. In 1979, he immigrated to the United States and began a career in the chemical industry here. During the last decade while working for The Dodge Company, Sam has focused on formaldehyde-free and low formaldehyde products for the embalming industry.