

The Slide-Sealing Compound "Glyceel"¹

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Abstract: "Glyceel" has been considered for many years to be the best sealant for whole mounts of soil, plant-parasitic, freshwater, and marine nematodes. However, "Glyceel" has not been available since the mid 1980s when its production was halted. Currently available substitutes are inadequate. The original formula for "Glyceel" has been found in the literature and is given here with a method of preparation. "Glyceel" prepared in this way by the author has been used and appears to function well.

Key words: Glyceel, nematode, nitrocellulose, slide sealer, Zut.

As a new investigator in the field of nematology, I need a good slide-sealing compound for specimens preserved in anhydrous glycerin. Nail polish often is used, but it has a high failure rate. It has proved to be an unstable barrier against glycerin as it tends to flow into the glycerin, resulting in fogging of the slide. Also, even moderate handling causes breaking of the bond between the coverslip and slide. Over time, nail polish shrinks and cracks, resulting in the glycerine leaking out (Esser, 1973). The compound of choice is Zut (Thorne, 1935) and its British equivalent "Glyceel," but both are unobtainable because B.D.H. Chemicals, Ltd. of Essex, England, stopped manufacturing "Glyceel" in the mid-1980s, and Bennett's of Salt Lake City, Utah, ceased production of Zut in the early 1980s.

In 1935, Thorne (1935) published a brief note on Zut, described as a 2:1 mixture of nitrocellulose and polymerized linseed oil to which butyl acetate could be added as a thinner and pigments for color. About a decade later, after obtaining the formula from Thorne, Goodey (1949) published it along with the American and British equivalents available at the time. Later, Wagstaffe and Fidler (1955) republished Goodey's formula. The formula was republished yet again by Hooper (1986).

In an attempt to reproduce the original compound, I have encountered difficulties in locating and obtaining some of the original ingredients. The ADM-100 linseed oil used by Thorne (1935) was manufactured by the Archer Daniels Midland Corporation (ADM). ADM no longer manufactures ADM-100; therefore, I have tested many commercially available linseed oil products, but none appear to be alcohol-soluble. According to ADM, ADM-100 was soluble in ethanol, whereas the linseed oil products manufactured today are mineral spirit and turpentine-soluble. Thus, I have used boiled linseed oil, which is available in the paint department of any hardware or home improvement store. Industrial methylated spirit is also readily available as denatured alcohol. When the linseed oil, methylated spirit, and butyl acetate are combined, the oil becomes highly soluble.

Because of its explosive nature, nitrocellulose must be stored in a well-sealed jar wetted with alcohol. If allowed to dry, it becomes extremely shock-sensitive, and immediate steps should be taken to wet it. Accordingly, this explosive nature makes nitrocellulose difficult to obtain. However, I.C.I. nitrocellulose HX 30/50 is still available through I.C.I. Chemical Company of Wilmington, Delaware.

To prepare "Glyceel," weigh out and combine the ingredients (Table 1) in a glass jar, and then seal. The sealing cap should have a polyethylene or other suitable liner that will not be affected by the solvents in the "Glyceel." Polyvinyl-coated pulp liners will dissolve. Seal the jar and place it on a rotator overnight or until all the nitrocellulose is dissolved. The mixture then can be thinned with butyl acetate.

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TABLE 1. Formula for Glyceel (Goodey, 1949).

Ingredient	Amount (g)
Polymerized linseed oil ^a	31.75
Nitrocellulose ^b moistened with 30% by weight of industrial methylated spirit	22.67
Industrial methylated spirit	4.76
Butyl acetate	20.41
Toluol (sulphur-free)	20.41

^a Archer Daniels Midland 100 (ADM-100) polymerized linseed oil (USA) or Younghusband, Barnes & Co., Alcohol Soluble T.V. linseed oil (UK).

^b Nitrocellulose, 1/2 second cotton (USA) or I. C. I. Nitrocellulose HX 30/50 (UK).

Slides prepared with Goodey's (1949) "Glyceel" appear to function well. To date, slides prepared are 6 months old, thus the long-term effectiveness of the compound is unknown. However, in comparisons with slides sealed with "Glyceel" manufactured

by B.D.H. Chemicals, no noticeable differences can be observed.

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