LOW VISCOSITY KIT

PROD. NO. 18300-4221
(as reported by Spurr, 1969)

18306-4221 ERL 4221	**250g**
18310 DER® 736	**250g**
18301 NSA	**450g**
18315 DMAE	**25g**

The original formulation, ERL 4206 (VCD) – DER® 736 embedding medium devised by Spurr (1969) combined very low viscosity components for rapid specimen penetration. This embedding medium has been especially suitable for a variety of mineral and biological specimens. Since ERL 4206 is no longer available, ERL 4221 has been substituted as a replacement*. It will work well for most users but it does have somewhat higher viscosity (180cp vs. 60cp) than the ERL 4206, which can impact some protocols employing vacuum embedding.

*__Reference:__ Ellis, E. Ann Microscopy Today, July, 33 (2006)

A block of MEDIUM hardness can be obtained by using the following formula based on a batch of 10 grams without the flexibilizer, DER 736:

TABLE 1	(medium)	(harder)	(softer)	(rapid)
ERL 4221	4.10g			
Diglycidyl ether of Polypropyleneglycol (DER® 736)	1.43g	.95g	1.90g	
Nonenyl succinic anhydride (NSA)	5.90g			
Dimethylaminoethanol (DMAE)	0.1g			0.2g

A harder block can be produced by decreasing the DER® 736 component to .95g in the above formula; a softer block by increasing the DER® 736 to 1.90g.

ALL STEPS MUST BE PERFORMED UNDER A HOOD AND GLOVES MUST BE WORN FOR PROTECTION.

Preparation:
Care should be taken to weigh the ingredients accurately into a beaker. The quantities given in the first column are for firm blocks. For harder blocks, decrease the DER® 736 to .95g; for softer blocks, increase the DER® 736 to 1.90g. For rapid cure, increase the DMAE. It is recommended to add the catalyst (dimethylaminoethanol) last, after having carefully mixed the other components. If bubbles are a problem, they may be eliminated by placing the beaker into a desiccator under a gentle vacuum.

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Either ethyl alcohol, acetone, tert-butyl alcohol, isopropyl alcohol or propylene oxide may be used for **dehydration.** If ethanol and propylene oxide are used, one should be careful to remove all the propylene oxide when transferring the specimen, since this volatile liquid can rapidly evaporate and leave the specimen dry.

For **infiltration**, the solvent is replaced with a 1:1 mixture of solvent and embedding medium, gently infiltrated (mixed) for at least 30 minutes at room temperature. Afterwards pour off or pipette out the 1:1 mixture and replace it with the 100% complete embedding medium for further infiltration of 30 minutes, preferably uncovered to allow any remaining solvent to evaporate. A second 30 minute infiltration with the 100% embedding medium is recommended. Specimens are transferred to clean, dry capsules, which are then filled with fresh embedding medium. An overnight polymerization can be obtained by 60ºC. A rapid polymerization can be accomplished in 3 hours at 70ºC if the amount of catalyst (DMAE) is increased to 0.2g in the above formula.

Other Related Products:

Description	Product No.	Amount
Ethyl Alochol	19206	l liter
Glutaraldehyde 8%, EM Grade	18421	10x10ml
Osmium Tetroxide 4%, aqueous, EM Grade	18459	10x2ml
Osmium Tetroxide, crystal, EM Grade	18456	1g
Propylene Oxide	18601	450ml
BEEM Capsules, 00 size	130-1	pk/500
Uranyl Acetate	19481	25g
Lead Citrate	19314	40g
Phosphotungstic Acid	19402	25g

CAUTION: Most epoxies are suspected carcinogens, at least to some degree. Epoxies, anhydrides and accelerators should all be considered toxic, in a general sense. Care should be taken to avoid direct contact with liquids or their vapors or dusts produced from the polymerized blocks. All work with these components, or mixtures of components, **must** be carefully performed within a properly vented fume hood.

In the event of direct contact with the skin, the affected areas should be immediately wiped dry with clean, dry paper towels, followed by a thorough washing with soap and water.

For complete handling instructions, please see the MSDS sheets for each chemical.

References:

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Spurr, AR & Harris, WM, Am. J Botany, 55 (1968)
Seligman, AM, et al, J Histochem and Cytochem, 15,1 (1967)
Richardson, KL, et al, Stain Technology, 35, 313 (1960)
Nemeth, F, Proc. 30th Ann Electron Micro Soc Amer, 697, L.A. (1972)

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