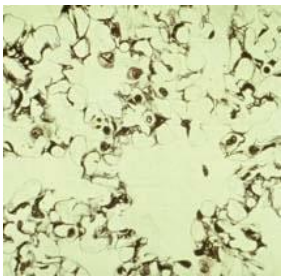
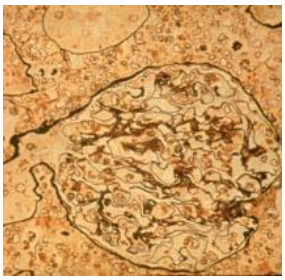
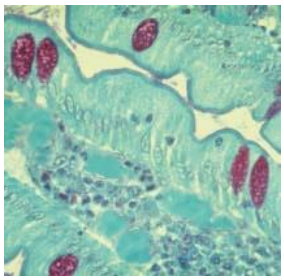
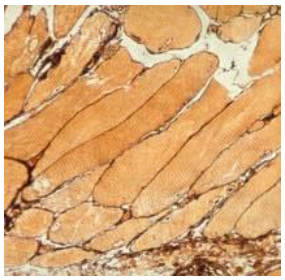
Technical Data Sheet

Technovit® 7100 Sections for Histological and Industrial Application

#14653

Technovit® 7100 is a plastic embedding system based on HEMA* (2-hydroxyethyl methacrylate). The hydrophillic resin is used in medicine, botany, zoology and in the industry for embedding tissues for light microscope studies. The sections can be used for histological staining and enzyme detection.

Technovit® 7100 transparently polymerizes. Uniform thin sections can be made out of the blocks with the rotation microtome. It is not necessary and also not possible to elute the plastic out of the block and the section.

Material properties

The chemical polymerization of Technovit® 7100 is initiated using a barbituric acid derivative in combination with chloride ions and benzoyl peroxide. The catalyst system does not have any aromatic amines compared to traditional systems.

Overview of the benefits

- Uncomplicated handling
- Reproducibility and reliability of the embedding due to the constant, documented quality controls of the individual components
- Low polymerization temperature due to Teflon embedding forms
- Uniform hardening of the block, thus uniform and thinnest possible sections
- Low shrinkage artefacts, thus excellent tissue morphology
- In addition to routine staining, enzyme detection is also possible
- Less toxic due to catalyst made of barbituric acid
- Polymerization at room temperature (20°C)

- Airtight sealing not necessary while hardening
- Decalcification not necessary for haematological iliac crest biopsies

Application

Prepare Technovit® 7100 in accordance with the step-by-step instructions. First place the fixated and dehydrated specimens in the pre-infi ltration solution and then in the infiltration solution. Vacuum intervals and/or agitation during the individual steps accelerate the embedding process.

Specimens for industrial application are placed directly in the infiltration solution or hardened without pre-treatment.

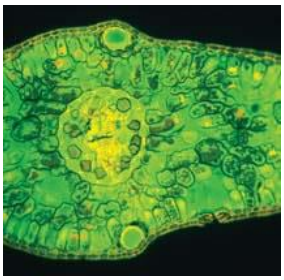
Polymerization

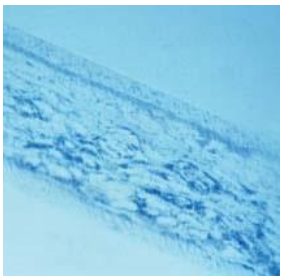
Prepare the polymerization mixture according to the instructions and then fill the embedding cavities with it. Immediately position the infiltrated specimens therein. Polymerization occurs at room temperature.

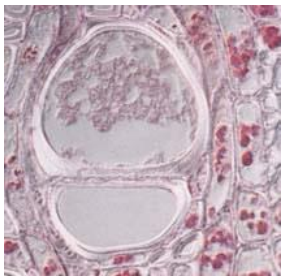
Polymerization temperature in:	
Histoform S	32°C - 38°C
Histoform Q	40°C - 45°C

Block after hardening (approx. 1½ hrs.) with Histobloc® and Technovit® 3040.

* HEMA is also known as GMA (Glycolmethacrylate)







Technovit® 7100 can be used in many fields. Application: organic preparations, plastics, films & paper, fibers, and much more...

Other fields of application

Technovit® 7100 is THE choice material for anything that pertains to making sections out of the embedded materials. The Technovit® 7100 - which was originally designed for histology - has proven itself in the industry for years due to its universal applicability.

For example, the fields of application include embedding and sections made out of:

- Plastics
- Films

- Paper
- Textiles
- Organic preparations
- Fibers

Material properties

In cases where material specimens are cut and examined with a light microscope, embedding Technovit® 7100 facilitates sections in the u-area.

The specimens can be economically cut in high quality with the Technovit® Histoblade, a disposable blade coordinated with this system.

These types of preparations are only slightly different from medicinal specimens.

In many cases it is not necessary to place it in the preparation solution, as is the case with films and plastics.

Instructions for embedding non-medicinal tissue specimens

- Infiltration in the preparation solution with vacuum is recommended for paper and textiles
- Biological preparations are medically handled (fixed, dehydrated and subsequently infiltrated)
- Materials that are less temperature-sensitive can also be embedded as large specimens (Histoform S and Q, or similar)

Product data

Designation	**Quantity**
Technovit® 7100	1 x 500 ml Basic Solution 5 x 1g hardener 1 1 x 40 ml hardener 2

Technical data

Color	Transparent
Density = spec. weight g/cm^3 (DIN 53479)	1,07
Refractive index Monomer Polymer	 1,4540 1,5050
Storage temperature	max. 25°C
Shelf life	2 years

Step by Step

Depending on the quality of the industrial specimens, e.g. non-porous materials such as films, etc., steps 1-4 can be omitted (fixing to infiltration) Polymerization can begin directly.

Fixation

Fix and retreat the pieces of tissue as needed.

Dehydration

Dehydration occurs in ethanol or acetone; gradual dehydration is possible with HEMA in buffer (+4°C). Alternating vacuum and agitation are helpful for better penetration during the embedding process. An intermedium is not necessary prior to pre-infiltration.

Pre-infiltration

Prepare the final concentration of the dehydration series in equal parts with basic solution Technovit® 7100. Approx. 2 hours at room temperature (20°C), e. g. 50 ml 96% ethanol: 50 ml of Technovit® 7100 basic solution.

Infiltration

Making the infiltration solution:	
Technovit® 7100 Basic Solution	100 ml
+ Technovit® 7100 hardener 1	1g (1 bag)

Dissolve in a clean (detergent-free) glass or polyethylene container for approx. 10 min. When sealed, the infiltration solution is stable for a maximum of four weeks at 4°C Infiltrate the specimens for up to 24 hours (room temperature) or longer at 4°C in a large enough volume of the infiltration solution, depending on the size of the specimens. A short vacuum (water jet pump) and agitation are helpful.

Polymerization

Making the Polymerization solution:	
Mix infiltration medium (unused)	15 ml
+ Technovit® 7100 hardener 2 for approx. 3-5 min mix.	1 ml

Use standard pipetting aids and disposable container!

Fill the Histoform embedding cavities halfway with the polymerization solution (disposable pipette), position the prepared specimen therein and fill the form (warning: only the cavity, not the entire recess). Polymerization occurs either completely (2 hrs.) at room temperature or 1 hour at room temperature and subsequently 1 hour at 37°C in the heating cabinet.

The slightly sticky surface (inhibition layer) can be removed with a lint-free disposable cloth.

Humidity that is too high favors a stronger inhibition layer!

Maximum polymerization temperature's dependence on ambient temperature

Ambient temperature	Histoform S	Histoform Q
Room temp. approx. 20°C	32	37
Refrigerator +4°C	16	23
Refrigerator on ice 0°C	10	18

Blocking and archiving

The specimen are blocked with Histobloc® and Technovit® 3040 so that they can be removed from the Teflon mold.

Processing

Tightly clamp the blocks in the totem cam devices on the rotation microtome. Use the Technovit® Histoblade (in combination with the Heraeus blade holder) or hard metal knife (note knife angle) to cut. Dryly remove the section with forceps and place in a bath (aqua dest.)

Place on a clean, grease-free and coated object holder. Let dry before staining for at least 15 minutes or overnight at 60°C. Place the deplasticized sections directing in the stain solution. A 1µ-section must be stained longer than a 5µ section for the desired stain intensity.

Overview of how to make the solution						
Solution	**Ethanol**	**Basic solution Technovit® 7100**	**Hardener 1 Technovit® 7100**	**Infiltration Solution**	**Hardener 2 Technovit® 7100**	**Application-temp**
Pre-infiltration	e. g. 50 ml	e. g. 50 ml				RT
Infiltration		100 ml	1g (1 bag)			RT/4°C
Polymerization				15 ml 30 ml	1 ml 1,5 ml	RT/37°C RT/37°C

Source of Information

Heraeus Kulzer, 2014