Dura-Gel – User Guide

CAMBRIDGE NeuroTech
Advanced Electrophysiology Systems

Description

Cambridge NeuroTech Dura-Gel cures in place to form a cushioning, self-healing and resilient barrier over exposed craniotomies and thereby acts as a dural-substitute where a durotomy has been performed or as a protective layer over intact but exposed dura. It is biocompatible, reduces the possibility of inflammation, reduces cerebrospinal fluid leakage, reduces humidity loss from the craniotomy, and remains soft for a period of weeks to months, thereby allowing microelectrode penetration with minimal force.

Uses

Dura-Gel can be used as a dural-substitute for chronically implanted animals, or for head-fixed animals with daily electrode penetrations. Dura-gel may also be used in conjunction with 2-photon imaging studies too.

Shelf-Life and Storage

Each Dura-Gel kit is marked with an expiry date; use of expired compound may lead to undesired problems affecting the gel properties. Dura-Gel should be stored at room temperature 23 ±3°C and 50 ±5% RH.

How to Use

Cambridge NeuroTech Dura-Gel is a two part silicone gel which should be mixed in a 1:1 ratio (Parts A and B; colourless and blue, respectively). The constituent parts can be easily dispensed using a sterile 1 ml syringe or a precision-pipette and hand-mixed in a suitable crucible or petri-dish immediately prior to use. We recommend a mixture of at least 20 drops of each component to ensure even mixing; inaccurate proportioning or inadequate mixing may cause localized or widespread problems affecting the gel properties.

Sterilisation

Dura-Gel can be sterilised by a standard autoclave cycle. We recommend decanting aliquots of each component in to a suitable container to allow for liquid expansion / prevent spillage. Sterilised Dura-Gel should be used within 48 hours of autoclaving.

Working Time and Cure

Working time (or pot life) is the time required for the initial mixed viscosity to double at room temperature (RT). The cure reaction begins when Parts A and B are mixed. As the cure progresses, viscosity increases until the material becomes a soft gel.

Dura-Gel pot life = **15 mins**

Dura-Gel cure time = **30 mins** (defined as the time required to reach 90% of its final properties).

Application During Surgery

Dura-Gel can be applied directly to the exposed pia mater or dura mater. We recommend using sufficient quantity of Dura-Gel to cover your craniotomy to a depth of at least 1 mm; prior application of a bead of bone cement around the edge of the craniotomy is a useful technique for creating a dam which allows for thicker applications of Dura-Gel where required, for example in larger animals or implants requiring direct access to superficial tissue layers.

For use in acute or head-fixed animals, Dura-Gel allows for multiple penetrations with our probes and can remain in place for extended periods of time (weeks to months). Should it be necessary to replace the Dura-Gel, it can be removed with a blunt spatula and a fresh mix applied to the exposed craniotomy. We recommend allowing 24 hrs between application and first penetration of the Dura-Gel with a probe, so to as ensure complete curing of the gel, particularly at the tissue interface; penetration prior to this period carries an increased risk of gel residue fouling on your probe, for which there is no satisfactory remedy.

References

- *Sedaghat-Nejad, et al., Behavioral training of marmosets and electrophysiological recording from the cerebellum. J Neurophsiology, 2019 Oct 1; 122(4):1502-1517.*

More Information

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