

## ABSTRACT

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Title of Thesis: Characterization of silicone scar treatment gels  
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This diploma thesis deals with characterization of silicone gels by various methods, specifically measurement of rheological properties, overall characterization of the composition by infrared spectroscopy, identification of volatile compounds by gas chromatography and determination of molecular weight distribution of polymers by gel permeation chromatography. The theoretical part provides information about scars and their treatment options and describes the principles and the evaluation of tests performed in the experimental part. Five commercial gels and three newly formulated scar healing gels were evaluated. Analysis of viscosity curves confirmed newtonian type of flow in commercial gels Scar Gel Dr. Max and Stratamed and in the newly formulated gels. Strataderm, RejuvaSil and ScarEsthetique show a decrease in viscosity under stress. Oscillation tests have shown a gel structure only with the commercial ScarEsthetique and RejuvaSil. Scar Gel Dr. Max, Strataderm, the newly formulated gels and Stratamed contain polymeric polydimethylsiloxane. In case of Scar Gel, Strataderm and Stratamed along with lower molecular weight polydimethylsiloxane with a molar mass of about  $10^4$  g/mol. Oligomers with a molar mass of hundreds to several thousand g/mol have been identified in Scar Gel Dr. Max, Strataderm and in the newly formulated gels, these oligomers are missing in Stratamed.

**Keywords:** silicone gel, scar treatment, infrared spectroscopy, gel permeation chromatography, viscosity curve, oscillation tests, polydimethylsiloxane