The viscosity of reservoir fluids is an important property in all aspects of reservoir production and it, along with its associated uncertainty, affects engineering design decisions. Reservoirs are currently being developed with increasingly elevated temperatures and pressures and with highly viscous fluids. Ultra-deep Gulf of Mexico offshore prospects and bitumen reserve extraction from oil sands are examples of areas where High Pressure (HP) and/or High Temperatures (HT) conditions and viscous fluids exist. The viscosity of reservoir fluids is routinely measured in commercial laboratories with capillary and falling body viscometers. These viscometers are typically calibrated at atmospheric conditions and specific temperatures with standard calibration fluids. Calibrations are then extended to elevated pressure and temperature conditions with empirical correlations or the viscometer is calibrated at limited temperature and pressure conditions with available HT-HP reference fluids. To lower the uncertainty of routine viscosity measurements, viscometers require accurate calibrations and/or reference fluids to verify equipment calibrations. Unfortunately, most current viscosity standards are inadequate for supporting improved experimental accuracies in HT-HP and high viscosity fluid environments. Squalane (C_{30}H_{62}, 2,6,10,15,19,23-hexamethyltetraicosane), a pure fluid of moderate viscosity, has been identified to fill the gap between existing reference fluids and potential HT-HP and high viscosity standards. During the fluid selection process, a critical analysis of existing squalane literature identified voids and discrepancies in the existing data sets. New experimental measurements were performed to fill these voids and this new data was combined with existing literature data to determine new reference equations for the viscosity and density of pure squalane. The model parameters were determined with a novel approach for robust regression, which combined global optimization and outlier detection algorithms. The overall algorithm, combined with the critical literature review, provided a reliable set of parameters, a recommended data set and determined the validity range of the models.