Supplementary Material for

Frictional properties and microstructural evolution of dry and wet calcite-dolomite gouges

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Introduction

This file contains (i) an image of the water bath designed to keep gouge samples saturated during slip, (ii) X-ray powder diffraction (XRPD) analysis of the starting materials, calcite-dolomite mixture batches, and deformed bulk gouge, and (iii) additional microstructures of experiment *s1324* performed at V = 1 ms^{-1}, normal stress of 26 MPa, and room humidity conditions, for comparison with experiment *s1221* performed at the same deformation conditions but at a normal load of 17.4 MPa.

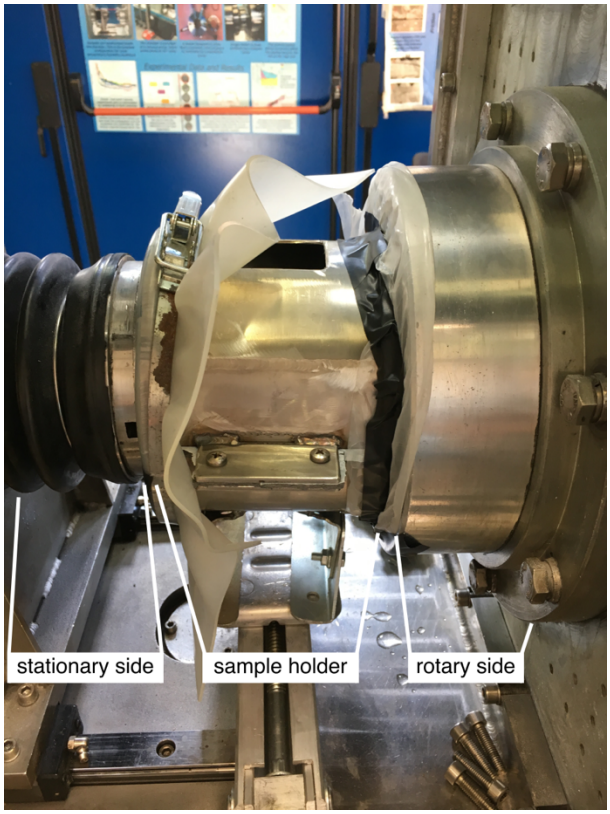

Figure S1. Photograph of the water bath designed to keep gouges immersed in water during deformation.

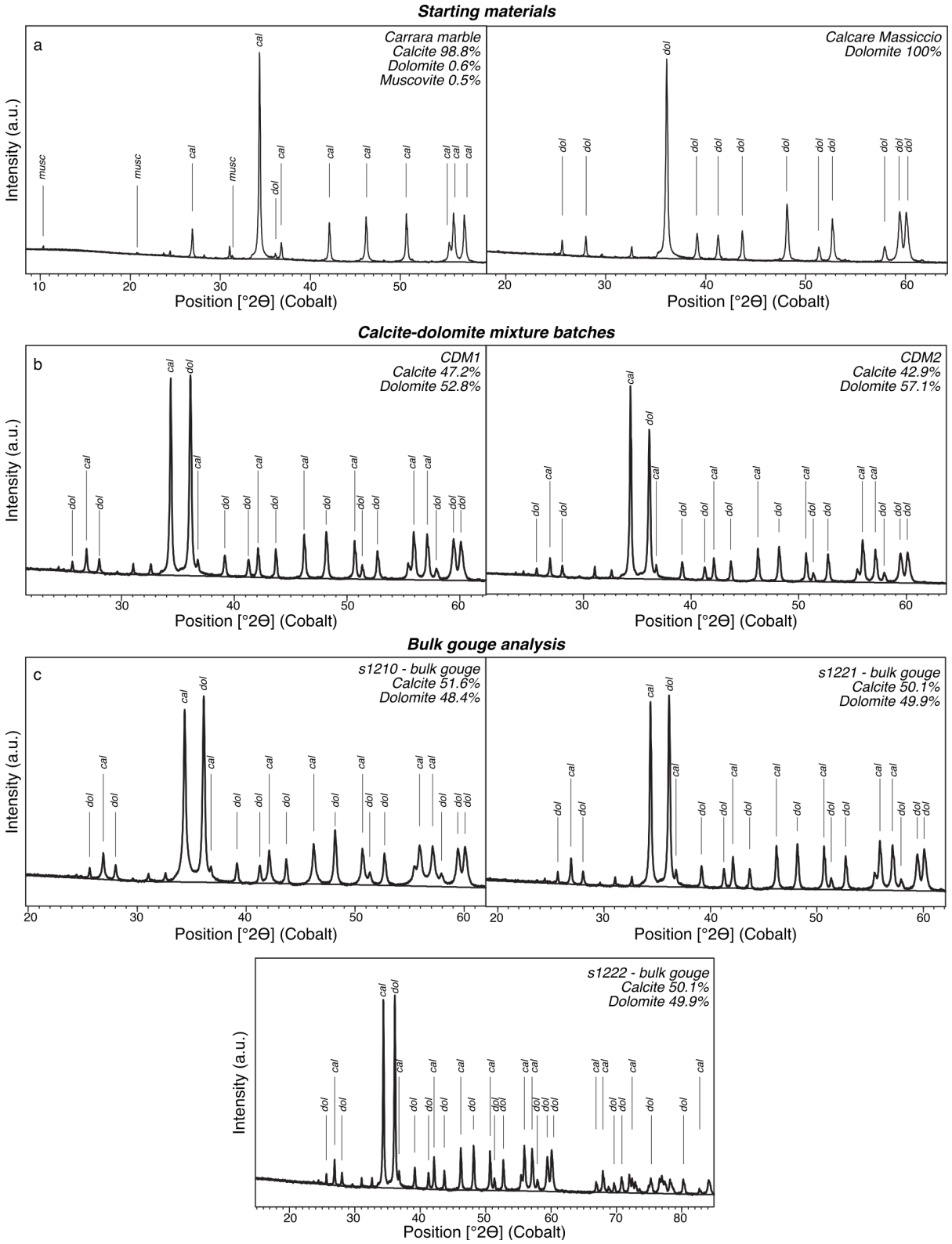

Figure S2. XRPD analysis of a) calcite and dolomite used to prepare the gouge mixtures, b) two batches of calcite-dolomite mixtures and c) deformed bulk gouge at different deformation conditions (see Table 1 in the main text for experimental conditions).

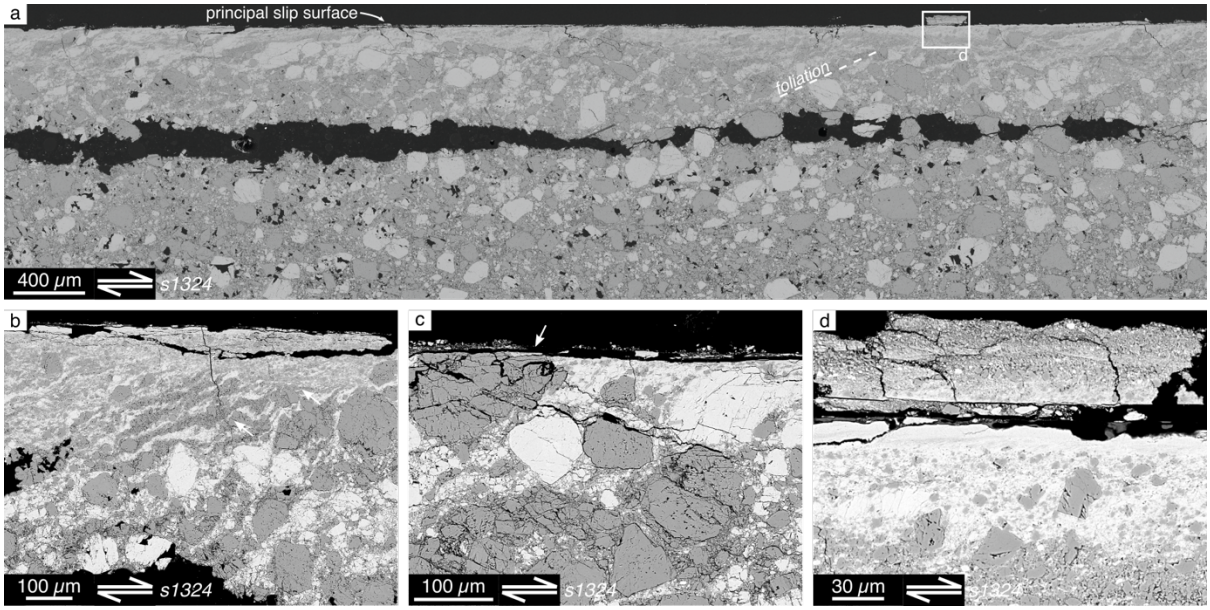

Figure S3. Microstructures of experiment *s1324*. (V = 1 ms^{-1}, σ_n = 26 MPa, room humidity conditions). a) Montage of the sample showing development of a well-defined foliation similar to experiment *s1221* (performed at normal load of 17.4 MPa). b) The foliation changes inclination when approaching the principal slip zone, becoming subparallel to the principal slip surface (i.e. horizontal). c) Truncated calcite and dolomite clasts along the principal slip surface. d) The principal slip zone is composed of a very fine-grained aggregate of calcite and dolomite, showing decreasing porosity when approaching the principal slip surface.