

A paint scraper hardness blade

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We present a new hand-held hardness gauge that measures penetration resistance over a length scale of about 100 grains. The apparatus consists of a 10 cm wide, 0.5 mm thick stainless steel blade with a sharpened leading edge attached to a digital push-pull gauge. The maximum force of penetration was recorded as the blade penetration index ("B"). The blade itself was adapted from an off-the-shelf paint scraper, so the only significant cost is in the choice of the push-pull gauge. The narrow profile of the blade minimizes the compression and densification of snow that is common to nearly all other hardness measures. Blade penetration measurements are easy to conduct, require no postprocessing or subjective judgements to interpret, and are highly repeatable compared to the hand hardness test. The gauge is useful for tracking the transition from storm snow (or otherwise cohesionless snow) to slab snow with increasing penetration resistance. The shape of the blade allows the relative hardness of slab and weak layers to be tracked. We present here details on the design and use of the blade hardness gauge and some general results.