

Table 1 Schmidt hammer R-values (mean \pm 95% confidence interval; n = 60) for successive impacts (Rw_1 to Rw_{10}) from weathered bedrock surfaces of age \sim 10,000 years (* Øyberget rock-glacier boulders).

Rock type	Location	Rw_1	Rw_2	Rw_3	Rw_4	Rw_5	Rw_6	Rw_7	Rw_8	Rw_9	Rw_{10}
Pyroxene-granulite gneiss	Gravdalen	33.8 \pm 2.4	51.7 \pm 1.8	56.7 \pm 1.6	60.7 \pm 1.1	61.2 \pm 0.9	61.2 \pm 1.2	62.4 \pm 1.2	63.1 \pm 1.0	63.0 \pm 1.1	63.1 \pm 1.6
Migmatitic gneiss	Alnesdalen	40.3 \pm 2.4	52.6 \pm 2.4	56.9 \pm 1.8	58.7 \pm 1.6	58.7 \pm 1.9	59.7 \pm 1.8	60.1 \pm 1.7	60.9 \pm 1.3	60.0 \pm 1.7	60.6 \pm 1.5
Augen gneiss	Loenvatnet	39.4 \pm 2.0	50.1 \pm 2.5	55.5 \pm 1.7	56.7 \pm 1.9	57.6 \pm 1.7	58.3 \pm 1.6	58.2 \pm 1.6	57.4 \pm 1.6	59.1 \pm 1.6	59.0 \pm 1.7
Granite	Kvamsdalen	38.9 \pm 1.7	50.8 \pm 2.0	55.9 \pm 1.7	57.8 \pm 1.6	57.6 \pm 1.7	57.8 \pm 1.9	58.4 \pm 1.6	57.6 \pm 2.3	59.2 \pm 1.4	57.9 \pm 1.6
Granitic gneiss	Fåbergstølen	38.5 \pm 1.9	49.3 \pm 2.0	53.8 \pm 2.0	55.5 \pm 1.4	55.0 \pm 2.0	55.3 \pm 1.6	56.3 \pm 1.6	57.2 \pm 1.6	57.8 \pm 1.3	58.1 \pm 1.3
Gabbroic gneiss	Bøverbreen	33.6 \pm 2.4	47.1 \pm 2.4	51.2 \pm 2.2	53.5 \pm 1.8	54.1 \pm 1.8	55.3 \pm 1.7	55.3 \pm 1.6	55.2 \pm 1.9	55.7 \pm 1.7	56.4 \pm 1.5
Quartzitic calcitic schist	Attgløyma	43.2 \pm 1.5	50.2 \pm 1.3	52.6 \pm 1.4	53.8 \pm 1.3	53.5 \pm 1.7	54.3 \pm 1.4	53.9 \pm 1.1	54.0 \pm 1.4	54.6 \pm 1.3	54.3 \pm 1.4
Peridotite	Gravdalen	29.4 \pm 1.9	41.8 \pm 2.5	46.6 \pm 2.0	48.6 \pm 2.1	51.5 \pm 1.6	51.9 \pm 1.7	52.4 \pm 1.6	52.9 \pm 1.5	53.9 \pm 1.4	53.2 \pm 1.4
Calcitic schist	Bøvertun	36.7 \pm 2.1	44.3 \pm 2.6	47.8 \pm 2.7	48.5 \pm 2.6	48.0 \pm 2.7	49.1 \pm 2.6	47.8 \pm 2.7	48.7 \pm 2.5	48.9 \pm 2.4	50.0 \pm 2.5
Pyroxene-granulite gneiss	Leirdalen	36.1 \pm 2.1	54.0 \pm 1.4	56.3 \pm 1.7	58.7 \pm 1.3	59.7 \pm 1.2	60.4 \pm 1.3	59.7 \pm 1.6	61.2 \pm 1.2	61.2 \pm 1.4	60.6 \pm 1.8
Migmatitic gneiss	Øyberget*	43.0 \pm 2.6	53.1 \pm 2.5	56.0 \pm 1.8	57.9 \pm 1.5	59.1 \pm 1.7	59.6 \pm 1.4	59.6 \pm 1.3	59.8 \pm 1.6	60.6 \pm 1.5	59.4 \pm 1.8
Granitic gneiss	Jostedalen	41.6 \pm 1.9	50.9 \pm 2.1	55.1 \pm 1.7	55.1 \pm 2.4	58.1 \pm 1.7	57.6 \pm 1.5	58.0 \pm 1.7	58.2 \pm 1.6	58.3 \pm 1.4	59.1 \pm 1.5
Gabbroic gneiss	Leirbreen	35.5 \pm 2.4	47.0 \pm 2.7	50.8 \pm 2.3	53.5 \pm 1.7	55.0 \pm 1.7	55.8 \pm 1.8	56.0 \pm 1.5	57.0 \pm 1.4	55.8 \pm 2.0	56.9 \pm 1.3

Table 2 Schmidt hammer R-values (mean \pm 95% confidence interval; n = 20) for successive impacts (Ru_1 to Ru_5) from unweathered rock surfaces.

Rock type and location	Ru_1	Ru_2	Ru_3	Ru_4	Ru_5	Surface type
<i>Pyroxene-granulite gneiss</i>						
Gravdalen	61.3 \pm 1.2	63.7 \pm 1.4	65.4 \pm 1.0	65.2 \pm 1.0	65.4 \pm 0.9	road-cutting bedrock
Storbreen glacier foreland	67.5 \pm 1.7	67.8 \pm 1.9	67.2 \pm 1.7	66.9 \pm 2.2	67.3 \pm 1.6	glacially-abraded bedrock
Storbreen glacier foreland	67.0 \pm 1.2	66.6 \pm 1.2	67.9 \pm 1.2	67.4 \pm 1.5	67.2 \pm 1.5	glacially-abraded boulders
<i>Migmatitic gneiss</i>						
Langfjelldalen	60.6 \pm 3.0	64.9 \pm 1.7	64.7 \pm 3.0	66.6 \pm 1.8	67.4 \pm 1.5	rockfall boulders
Øyberget	61.7 \pm 3.2	65.6 \pm 2.8	66.9 \pm 2.0	67.1 \pm 1.5	65.4 \pm 3.1	rock-glacier boulders (potassium-feldspar bands)
Øyberget	63.6 \pm 2.5	68.8 \pm 1.1	69.3 \pm 1.7	68.8 \pm 1.8	69.5 \pm 1.1	rock-glacier boulders (biotite-mica bands)
<i>Augen gneiss</i>						
Briksdalsbreen glacier foreland	67.0 \pm 1.3	68.6 \pm 1.3	68.6 \pm 1.5	68.2 \pm 1.3	67.5 \pm 1.9	glacially-abraded bedrock
<i>Granite</i>						
Nystølsnovi	57.1 \pm 2.5	61.7 \pm 2.4	63.7 \pm 2.3	64.0 \pm 2.0	64.2 \pm 2.0	rockfall boulders
<i>Granitic gneiss</i>						
Fåbergstølsbreen glacier foreland	68.2 \pm 1.7	69.0 \pm 1.4	69.6 \pm 1.7	69.3 \pm 1.6	68.0 \pm 2.1	glacially-abraded bedrock
Nigardsbreen glacier foreland	69.5 \pm 1.9	69.8 \pm 2.3	71.3 \pm 1.2	70.3 \pm 1.7	70.0 \pm 1.7	glacially-abraded bedrock
Fåberstølen	66.9 \pm 1.7	68.5 \pm 1.5	69.5 \pm 1.3	68.9 \pm 1.6	68.6 \pm 1.6	road-tunnel bedrock
<i>Gabbroic gneiss</i>						
Bøverbreen glacier foreland	66.1 \pm 2.5	68.2 \pm 2.1	69.5 \pm 1.3	68.9 \pm 2.1	69.3 \pm 1.4	glacially-abraded bedrock
Leirbreen glacier foreland	66.7 \pm 1.1	67.3 \pm 1.1	67.4 \pm 1.1	67.0 \pm 1.1	67.9 \pm 1.6	glacially-abraded bedrock
<i>Quartzitic calcitic schist</i>						
Attgløyma	53.6 \pm 3.1	56.4 \pm 2.7	57.1 \pm 3.2	57.9 \pm 2.9	58.6 \pm 2.6	hydro-electric tunnel bedrock
<i>Peridotite</i>						
Gravdalen	63.0 \pm 1.6	67.5 \pm 2.0	66.6 \pm 2.1	67.3 \pm 2.1	67.3 \pm 2.1	road-cutting bedrock
Storbreen glacier foreland	67.9 \pm 2.8	70.0 \pm 1.7	69.4 \pm 2.4	67.8 \pm 2.8	67.3 \pm 3.0	glacially-abraded boulders
Mjølkedalsbreen glacier foreland	67.8 \pm 0.8	68.2 \pm 0.9	68.4 \pm 0.3	68.3 \pm 0.7	68.8 \pm 0.8	glacially-abraded bedrock
<i>Calcitic schist</i>						
Bøvertunvatnet	54.4 \pm 3.7	54.4 \pm 3.6	56.5 \pm 3.1	55.6 \pm 3.9	57.4 \pm 3.0	road-cutting bedrock

Table 3 Indices of degree of weathering from Schmidt-hammer R-values for weathered rock surfaces

Rock type	Location	$Rw_5 - Rw_1$	I_2 (%)	I_5 (%)	I_{10} (%)	$Ru_5 - Rw_5$	Improved $*I_5$ (%)
Pyroxene-granulite gneiss	Gravdalen	27.4	34.6	44.8	46.5	4.2	48.3
Migmatitic gneiss	Alnesdalen	18.4	23.4	31.3	33.5	8.7	40.2
Augen gneiss	Loenvatnet	18.2	21.4	31.6	33.3	9.9	41.6
Granite	Kvamsdalen	18.7	23.4	32.4	32.8	6.6	39.4
Granitic gneiss	Fåbergstølen	16.5	21.9	29.9	33.8	13.3	43.6
Gabbroic gneiss	Bøverbreen	20.5	28.5	37.8	40.3	15.2	51.5
Quartzitic calcitic schist	Attgløyma	10.3	13.9	19.2	20.4	14.4	36.4
Peridotite	Gravdalen	22.1	29.7	42.9	44.7	16.3	56.6
Calcitic schist	Bøvertun	11.3	17.2	23.5	25.1	9.4	36.1
Pyroxene-granulite gneiss	Leirdalen	23.6	33.1	39.6	40.5	7.6	47.6
Migmatitic gneiss	Øyberget*	16.1	19.0	27.2	27.6	8.4	36.2
Granitic gneiss	Jostedalen	16.5	18.3	28.4	29.7	11.9	40.6
Gabbroic gneiss	Leirbreen	19.5	16.7	25.3	24.7	12.9	47.7