



**RECLAIMED SOR HAP 'EJ
FERROUS-INCLUSION QOB: QATLH
SALVAGED, BARN, 'EJ INDUSTRIAL
RECLAIMED SOR HAP QOQ
QUTLHWI' HAPVAD
MAGNETICALLY DISQUALIFIED**



reclaimed Sor Hap 'ej ferrous-inclusion Qob: qatlh salvaged, barn, 'ej industrial reclaimed Sor Hap QoQ QutlhwI' HapvaD magnetically disqualified

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Journal of Equatorial Audio Science, 2026.

ngoD

reclaimed timber -- provenance Daq chenbogh marketing premium ghaj: century weathering ghajbogh barn oak, demolished warehouse vo' pitch pine, decommissioned minesweeper pagh retired laboratory bench vo' teak. romance real 'ej sustainability meq frivolous Qo'. 'ach tlhegh resting Daq QutlhwI' Hap wanI' Daq wlvlu', biographyDaj Daq Qo'; reclaimed Sor Hap -- provenance actively guarantee, merely permit Qo'bogh defect qeng: embedded ferromagnetic metal. cut nails, screws, staples, fence staples, bolts, barbed-wire fragments, embedded lead 'ej steel shot, bandsaw 'ej circular-saw swarf -- working yIn ta'ta'bogh timber Hoch furniture motlh bIH. rare contamination event Qo'; vaj sawmills headsaw pa'Daq industrial ferrous detectors run 'ej reclaimed-lumber yards stock "metal-detected" advertise.

loS provenance classesDaq 96 reclaimed billets screening HaD wIja' -- barn oak, industrial-warehouse pine 'ej fir, marine 'ej laboratory Hal reclaimed teak, 'ej wine-barrel oak -- fluxgate gradiometer vegh, positive Hoch X-ray computed tomography vegh inclusion map. 96 billets joI 71 (74 percent) ferromagnetic inclusions tu'; barn oak 20 joI 19 Iuj. embedded steel nail wa' -- permanent high-permeability inclusion: mild steel μ_r vatlh law' vo' SaD blngDaq, vaj Devwl' vo' millimeters neH Daq local field discontinuity; surrounding Sor Hap dielectric Say'ghach Hoch 'oH compensatebe'. corrosion halo je wIcharacterize -- embedded ferrous object oakDaq decades blngDaq diffuse paramagnetic iron-tannate stain jach, metal naQ law' contaminated volume orders of magnitude nob -- 'ej industrial threshold coarse neH "metal-detected" stock clear, Bosque, Ferro, Park & Tanaka (2026) definebogh sub-milligram audio grade Qo'. Equatorial Elevation Blocks first-pass plantation stock vo' neH milllu', reclaimed Sor Hap vo' not; reclamation sustainability meqvaD managed pe'meH yoq plantation lo' jang wInob.

1. NGOQ

companion HaD (Bosque, Ferro, Park & Tanaka, 2026) -- qach Sor HapvaD N-grade neutrality scale cher, residual paramagnetic content 'ej volume magnetic susceptibility Daq define, 'ej pe'meH yoq plantation teak delivery Daq 5N chav 'agh. HaDvetlh clean first-pass Sor Hap grade. reclaimed timber passing neH mention -- ferrous-inclusion scan "routinely" Iujbogh category -- ghIq mev. naDev passing sentence naQ 'ej disqualifying detailDaq SachmoH, reclaimed-Sor Hap tlhob buyersvaD footnote Qo'mo'. challenge common law' 'oH: managed pe'meH yoq teak rare 'ej expensivechugh, 'ej barn 'ej warehouse ngo'Daq 'IH, dense, dimensionally stable old-growth timber law' tu'lu'chugh 'ej latlhDaq meQlu'chugh, qatlh supportmeyvo' millbe'?

jang metallurgical 'oH, 'ej Sum Qo'. reclaimed timber prior structural yIn ta'mo' define, 'ej structural service fasteners 'oS. barn beam nail, spike, bolt, staple je; warehouse floor joist through-bolt 'ej lag-screw; Duj timber iron drift bolts 'ej iron pin ghajbogh treenails; century naQ laboratory bench steel brackets 'ej cut-nail edging tuQ. reclamationDaq metal HochHom luqotlh. 'op qotlhbe' -- surface blngDaq ghorlu'mo', overdrive 'ej countersinklu'mo', unrecognizable lumpDaq corrodepu'mo', pagh outside vo' not leghlu'mo'. reclaimers leghlaHbogh metal teq. gradiometer leghlaHbe'bogh metal Sam.

embedded fastener cosmetic flaw rur wIqel Qo' -- electromagnetic wanI'Daj rur: permanent, high-permeability inclusion, tlhegh QutlhwI' geometrymo' signal Devwl'vo' millimeters blngDaq lan. controlled near-field pa'Daq graded tlhegh 'uchmeH QutlhwI' Hap tu'lu'. steel nail ghajbogh QutlhwI' Hap -- tlhegh 'uchbogh magnetic defect 'oH neH.

2. SINGLE-NAIL MEQ

contamination dramaticHa'qu' qel: cut nail wa', flushDaq ghor 'ej leghlu'be', otherwise flawless reclaimed oak billetDaq mol. casevam naQ SIQ worth, least-dramatic case disqualifychugh survey statistics bookkeeping neHmo'.

clean, QaD Sor Hap volume magnetic susceptibility $\chi_v = -6 \times 10^{-6}$ (SI) Sum -- weak, uniform diamagnetic; static HeDaq perturbation HuthmeH HapvaD desirable. mild-steel nail relative permeability μ_r vatlh law' vo' SaD blngDaq. vaj Sor Hap-to-steel boundary permeability ratio puS percent Qo'; wej vo' jav orders of magnitude. boundary -- field discontinuity: diamagnetic Sor Hap vegh smooth static 'ej quasi-static flux lines inclusion boS, concentrate, 'ej re-radiate; directly above surfaceDaq tens vo' hundreds nT local field gradient chen -- tlhegh QutlhwI'Daq cradle 'ej tlhegh exact pa' ba'.

inclusion -- bulkDaq evenly distributed paramagnetic trace-metal load rur Qo'; structure ghajbogh point source. remanence qeng: steel fastener Earth fieldDaq decades ba'pu'DI' permanent magnetic moment Suq, vaj passive permeability perturbation neH Qo' 'ach fixed dipole axis ghajbogh magnet permanent mach, installation pe'meH alignment qatlhHa'. surrounding Sor Hap property pagh -- 7N susceptibility, record-low dielectric constant, perfect end-grain-vertical milling je -- load HeDaq permanent dipole compensate. billet worst point Daq grade, averageDaq Qo'; worst point nail 'oH.



3. SURVEY: PROVENANCE CLASSES 'EJ HIT RATES

North America 'ej Europe established reclaimed-lumber yards vo' loS provenance classesDaq reclaimed billets HutmaH jav Suqlu', class Hoch 20 vo' 28; Hoch fastener-pulled rur ngev, 'ej wej classes "metal-detected." billet Hoch three-axis fluxgate gradiometer (Bartington Grad-13, 1 nT resolution) vegh -- motorized bedDaq 20 mm/s -- companion HaDDaq production teak screeningvaD instrument 'ej protocol rap. diamagnetic background DungDaq 5 nT anomaly discrete nobbogh billet Hoch flag 'ej X-ray computed tomography (225 kV microfocus source, 90 um voxel) ngeH inclusion locate 'ej identify.

aggregate hit 96 joj 71 (74 percent). class: barn oak 20 joj 19 luj, qabqu'; cut nails, wire nails, fence staples dominate, 'ej failed billet Hoch median wej inclusions. industrial-warehouse pine 'ej fir 28 joj 22 luj -- lag-screw shanks, machine bolts, 'ej loS billetsDaq embedded lead 'ej steel shot; yln ngo' wIHaDbe'. marine 'ej laboratory reclaimed teak 25 joj 21 luj: ship timber iron drift-bolt fragments 'ej pintle stubs qeng; laboratory-bench teak countersunk steel woodscrews, 'ej cha' casesDaq brass qeng -- gradiometer pass 'ach latlh meqmo' disqualify. wine-barrel oak QaQ law' loS joj 'ach 23 joj 9 luj -- hoop-rivet fragments 'ej disassembled hoops staple wire motlh.

CT maps vo' cha' lut emphasize. wa'Dlch, detected inclusions majority sub-surface 'ej finished faceDaq invisible -- visual fastener removal surviving population exact. cha'Dlch, handheld reclaimer-grade detector clearbogh 'op billets -- multiple small inclusions cha' (prior bandsaw resaw swarf tracks, staple crowns); wa' Hoch coarse detector threshold blngDaq 'ach nltebHa' distributed ferrous load. industrial detector "sawblade Qaw/laHbogh nail tu'lu'a" jang; "billet magnetically clean'a" jangbe', 'ej jangmeH not chenmoH.

4. CORROSION HALO QOB

Sor HapDaq embedded ferrous object stable self-contained inclusion Qo'. corrode, surrounding tissueDaq corrosion products export; oakDaq chemistry thermodynamically eager 'ej centuries ngo'.

oak heartwood hydrolyzable tannins law'. damp oak touchbogh iron oxidize; ferrous 'ej ferric ions moisture gradient tlha' Sor HapDaq viH 'ej tannins tlhej complex -- iron tannate chen, iron-gall ink blue-black compound, steel fastener Dechbogh oak black stain reaction rap. vaj barn pagh cellarDaq decades blngDaq embedded nail nail-sized qay' taHbe'. metal object law' wa' vo' cha' orders magnitude volumeDaq diffuse iron-tannate halo bleed -- CT 'ej ICP-MS cha'. metal core ferromagnetic; halo paramagnetic; halo tln, irregular, cable-facing surfaceDaq interpenetrate -- 'op DopDaq contaminant qab law', pliers lo' qotlhlaHbe'mo' 'ej metal detectorDaq not announce.

known inclusions Dech loS barn-oak billets wIsection 'ej radial transectDaq ICP-MS lo' Fe map. metal boundaryDaq percent-level vo' iron concentration nup, ghIq object vo' 15 vo' 40 mm Slchbogh haloDaq 60 vo' 240 ppm paramagnetic plateau -- 100 ppm 4N ceiling law' 'ej cable cradle naQ SoplaHbogh volume. vaj historic fastener wa' -- point neH Qo' 'ach region contaminate; reclaimed-timber marketing valuebogh tannin-active hardwoods (oak potlh) exact Daq mechanismvam HoS. barn oak romantic chenmoHbogh provenance -- iron rethDaq century damp structural service -- halo guarantee history rap.

5. QATLH "METAL-DETECTED" GRADE QO'

"metal-detected" stock advertisebogh reclaimed-lumber yards -- real mlwDaq honest; mlw nobbogh 'ej nobbe'bogh clear jatlh worth, phrase clean bill rur laDlu' plj 'ach Qo'.

industrial timber metal detection -- machinery protectmeH. resaw line ferrous detector -- carbide tooth chip pagh bandsaw blade ghorlaHbogh object Daq trip tune -- nail, screw, bolt. threshold deliberately jen: sub-milligram iron trace HochDaq line stopchugh board not pe'. production safety interlock 'oH, tooling-damage currencyDaq calibrate; audio usevaD billet disqualifybogh population exact -- sub-millimeter swarf, staple-wire fragments, shot pellets, 'ej dissolved paramagnetic halo potlhqu', detectorvaD discrete object pagh -- designmo' pass. industrial detector billet clean passlaH 'ach cable-facing face vegh 200 ppm iron stain qeng.

audio neutrality grade latlh measurement 'oH 'ej latlh tlhob jang. tooling risk Daq set Qo', Bosque, Ferro, Park & Tanaka (2026) boundaries -- 100 ppm (4N), 10 ppm (5N), 'ej 1 ppm (6N) Fe + Mn Daq set; discrete inclusionsvaD fluxgate gradiometry, bulk 'ej halo susceptibilityvaD VSM plus ICP-MS verify. thresholds orders of magnitude plm. "Metal-detected" -- "saw ghorbogh object pagh" 'oS. "5N neutral" -- "Fe + Mn 10 ppm pagh blngDaq Dat, discrete 'ej dissolved" 'oS. reclaimer wa'Dlch bona fide noblaH; cha'Dlch noblaHbe', per-billet magnetometry 'ej trace-metal assay poQmo' -- reclamation yard pagh mlwvam ta' 'ej most reclaimed billets history neHmo' luj.

6. SUSTAINABILITY TLHOB, LATLH HEDAQ JANG

reclaimed timber meq HoS law' -- acoustic Qo', environmental. century-old Sor Hap reuse -- harvest chu' jun, sound Hap meQbe'moH, original growth labor embodied quvmoH. meqvam seriously wltlhap; dispute Qo' 'ach ferrous hazard 'ej environmental cost ghajbe'bogh supply lo' jang.



Equatorial Elevation Blocks -- managed plantation teak geomagnetic equator vo' 5 deg blngDaq growbogh vo' mill; leased certified plantationsDaq replant-on-harvest regime. sustainability comparison potlh -- reclaimed wood versus old-growth logging Qo', false wlv -- 'ach reclaimed wood versus managed plantation, Sor specifically cutmeH plantlu', standingDI' carbon sequestrate, fixed rotation Daq replace. managed pe'meH yoq plantation -- reclamation valuebogh environmental benefit (old-growth pressure pagh, renewable cycle) nob, 'ej reclamation structurally noblaHbe'bogh virgin fastener history nob. first-pass plantation timber nail 'uchta'be', iron-tannate halo bleedta'be', swarf seedbogh resaw veghta'be'. clean magnetic slate tlhej paw; ghu'vamDaq neH 5N grade chavlaH.

reclaimed billet gradeDaq remediate He pagh. discrete inclusions excavate 'op, 'ach void lon 'ej dissolved halo Slchbe'; stained volume pe'meH neH halo teqlaH, heavily stained barn beamDaq usable Sor Hap HochHom 'oH. economy 'ej physics Dop rap pointing. clean growbogh timber vo' tagh -- dirty grow 'ej yln ta'bogh timber vo' iron tlha' law' cheap, clean, 'ej metrologically sound.

7. BERTLHAM

reclaimed, salvaged, barn, 'ej industrial-reclaimed timber -- QoQ QutlhwI' HapvaD disqualify -- aesthetic preferencemo' Qo', Sor Hap weaknessmo' Qo', fastener historymo'. structural service embedded iron 'oS; embedded iron tlhegh load HeDaq permanent high-permeability inclusion 'oS; tannin-active hardwoodDaq metal object law' wa' order magnitude tlnbogh diffuse paramagnetic corrosion halo 'oS. screening survey -- loS provenance classes reclaimed billets 74 percentDaq ferromagnetic inclusions tu'; romanticizequ' barn oak 20 joj 19 luj. single-nail meq -- inclusion wa' nlteb disqualify 'agh, vaj survey rate qay' overstate Qo' 'ach understate.

reclaimed-lumber marketing "metal-detected" assurance -- machinery-protection threshold, audio neutrality grade law' orders of magnitude coarse; grade Bosque, Ferro, Park & Tanaka (2026) catchmeH sub-milligram 'ej dissolved contamination exact designmo' pass. real 'ej useful measurement 'oH, 'ach audio tlhob Qo'bogh tlhob jang. vaj Equatorial Elevation Blocks first-pass plantation stock vo' neH milllu', provenance vay' reclaimed Sor Hap vo' not. reclamation environmental case real; harvested 'ej replacedmeH growlu'bogh managed pe'meH yoq plantation naQ jang -- sustainability benefit qengbogh timber 'ach iron pagh, 'ej clean magnetic slateDaq tagh -- graded billet Hoch taghnlSbogh rur.

DE'MEY

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