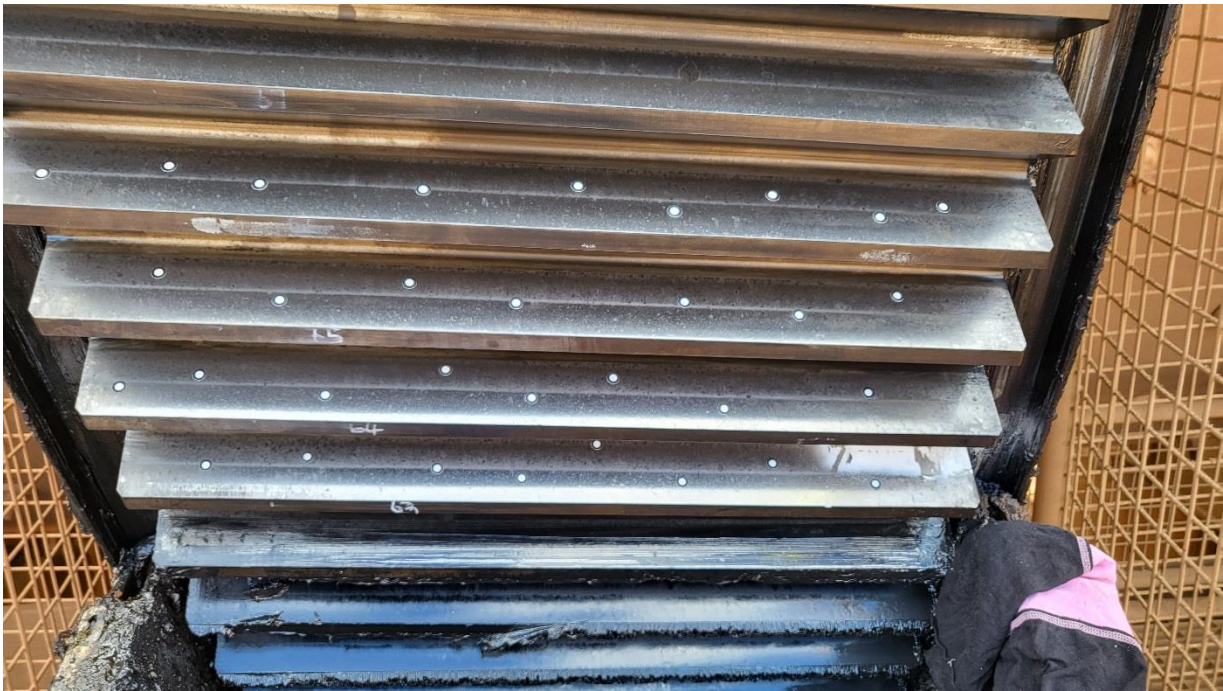


A Miner Resources Mill Girth Gear DIMENSIONAL SCANNING



Equipment Name	A Minesite Mill
Part Name	Girth Gear Girth Gear Splitline Number 1
Inspector	Justin Marwick
Date	

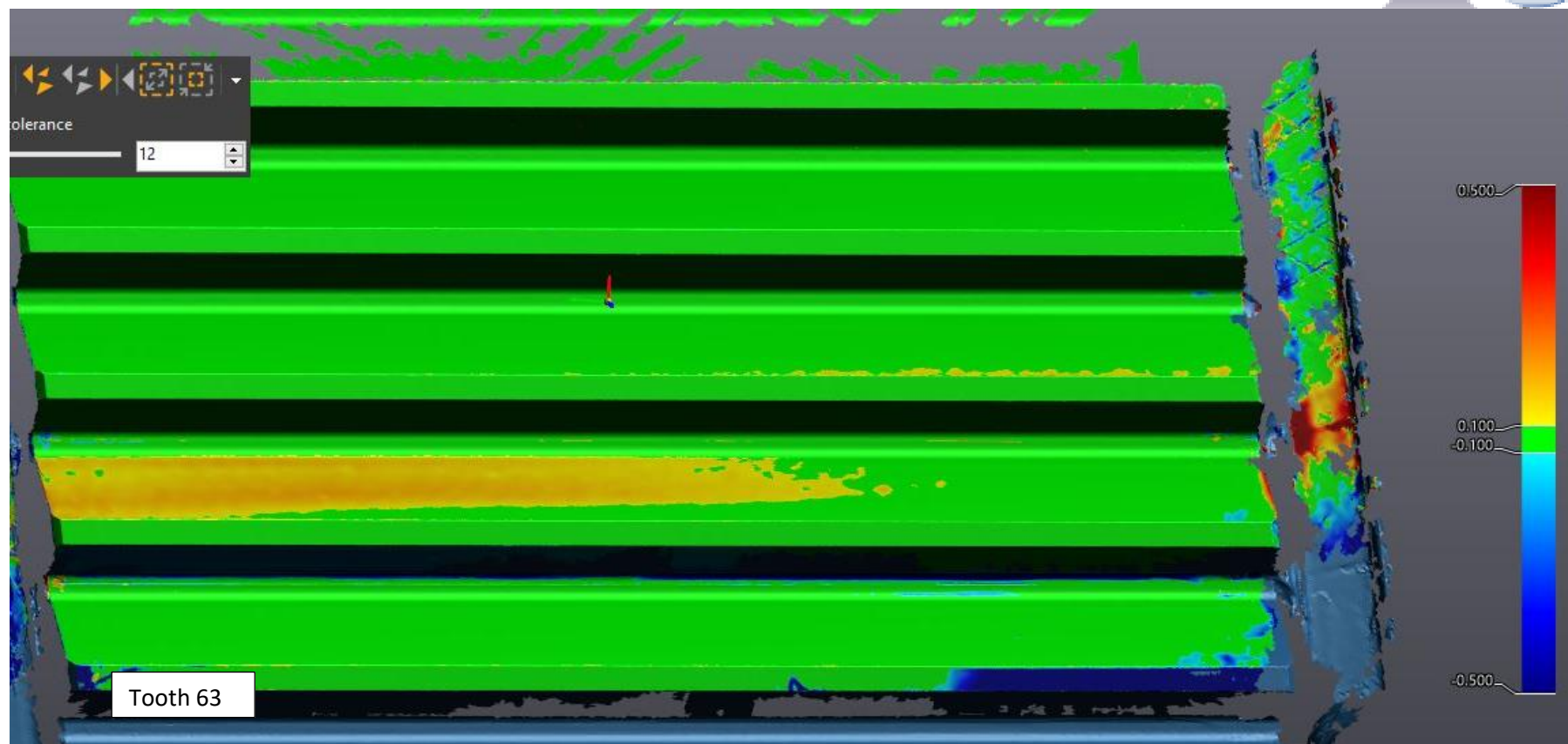
Girthgear teeth 63 to 66



Girth Gear teeth 63 to 66



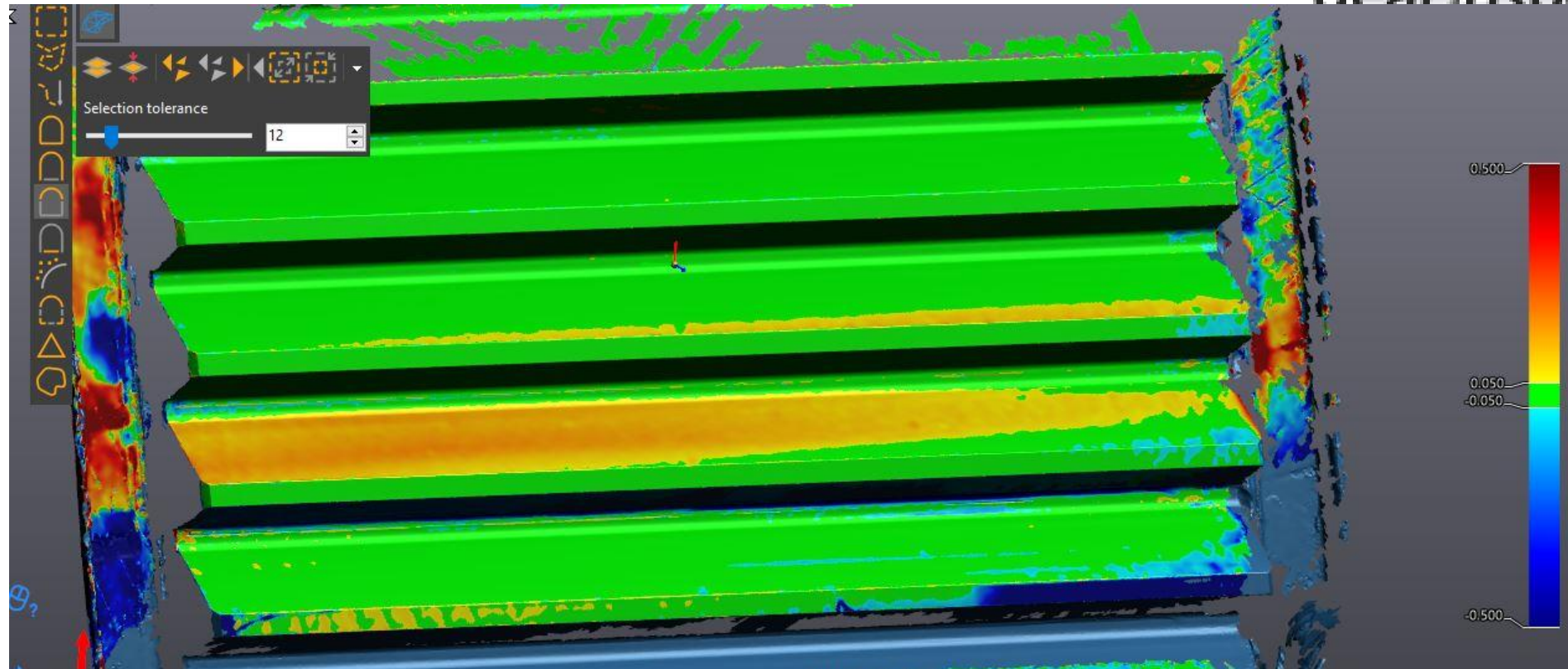
0.500mm Maximum deviation and acceptance of 0.100mm (green)

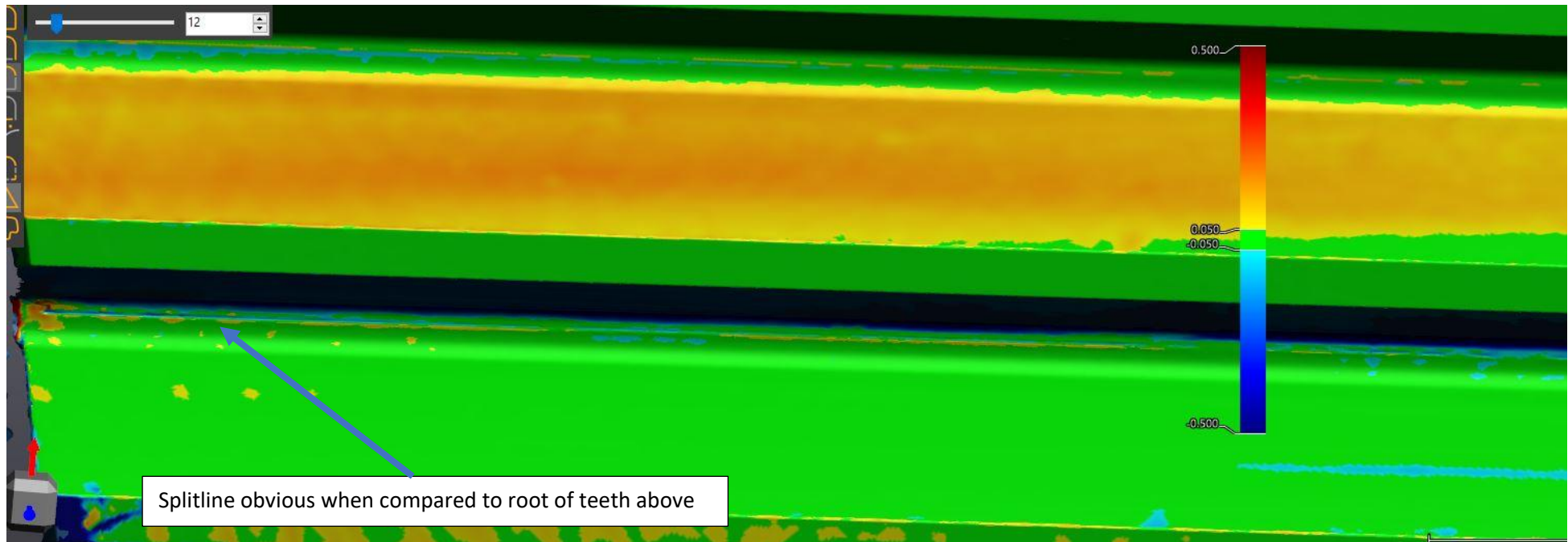


Colour map with acceptance at 0.10 mm and full scale at 0.5mm. Evidence of pitch error between tooth 63 and 64 – yellow indicates that compared with the pitch between teeth 64 and 65 the pitch error of around 0.200 – 0.300 mm was present. This agrees with the feeler gauge results from January.



Gear teeth 63 to 66 compared to the next teeth up Acceptance (green) +/- 0.050mm









APPENDIX A

Handiscan Black Elite

Specifications





HandySCAN3D™

**WHEN ACCURACY
 MEETS VERSATILITY
 AND PORTABILITY**

The HandySCAN 3D™ line-up is a proven and trusted patented metrology-grade 3D scanner. Optimized to meet the needs of design, manufacturing and metrology professionals, it provides the most effective and reliable way to acquire accurate 3D measurements of physical objects anywhere.

Portable, accurate and simple to use, the HandySCAN 3D features unmatched speed that captures high-quality measurements. Since it performs regardless of environment changes or part movement, it represents the ideal tool for quality assurance and product development applications.



**ACCURACY OF
 0.025 mm (0.0009 in)**



**SCAN-TO-MESH
 IN SECONDS**



**CERTIFIED
 ISO 17025**



**WORLDWIDE
 SUPPORT**



**LARGE
 SCANNING AREA**



**PATENTED
 TECHNOLOGY**



- 1 High-performance optics
Optimal scan quality
- 2 Extra single line
Easy capture of hard-to-reach areas
- 3 Blue laser technology
High resolution capability
- 4 Stand-off distance
color indicator
Maximizes scanning performance
- 5 Multifunction buttons
Quick access to frequently used
software functionalities
- 6 Highly ergonomic
and sleek design
Provides outstanding
user experience



ACCURACY & RESOLUTION

The HandySCAN 3D delivers accurate, high-resolution and repeatable results, regardless of the measurement setup quality and no matter the user experience. Featuring dynamic referencing, both the scanner and part can move during measurement and still provide an accurate and high-quality scan.

Accuracy
 0.025 mm (0.0009 in)
Volumetric accuracy
 0.020 + 0.040 mm/m (0.0008 in + 0.0005 in/ft)

Reliable acceptance test
 Based on VDI/VDE 2634 part 3 standard
 ISO 17025 accredited laboratory

High resolution for fine details



PORTABILITY

This handheld 3D scanner is a stand-alone device that does not require a tripod nor any external tracking device to operate. Fitting in a small suitcase, it can be brought anywhere and used in any environmental conditions without affecting its performance.

Lightweight
 0.94 kg (2.1 lb)

Dynamic referencing
 Both the object and scanner can be moved freely while scanning

Fits into a suitcase
 Take it anywhere you need



SIMPLICITY & VERSATILITY

With its user-friendly interface and ergonomic design, the HandySCAN 3D measurement solution has a short learning curve. Highly versatile, it can be used to scan various object sizes and surface types in real time—all with the same device.

Plug and play
 Simple user interface and real-time mesh visualization
 Single device fits all needs
 Masters complex and difficult surfaces



SPEED

The HandySCAN 3D scanner features multiple laser crosses and an automatic mesh generation, enabling a faster workflow from the set-up to the scan and then to the file!

Instant mesh
 Ready-to-use files
High measurement rate
 Up to 1,300,000 measurements/s
11 laser crosses scanning area
Quick set-up
 Up and running in less than 2 minutes

TECHNICAL SPECIFICATIONS

Innovating technology that provides TRUaccuracy™, TRUsimplicity™, TRUportability™ as well as real speed to your metrology-grade applications.

	HandySCAN 307™	HandySCAN BLACK™	HandySCAN BLACK™IElite
ACCURACY⁽¹⁾	Up to 0.040 mm (0.0016 in)	0.035 mm (0.0014 in)	0.025 mm (0.0009 in)
VOLUMETRIC ACCURACY⁽²⁾ (based on part size)	0.020 mm + 0.100 mm/m (0.0008 in + 0.0012 in/ft)	0.020 mm + 0.060 mm/m (0.0008 in + 0.0007 in/ft)	0.020 mm + 0.040 mm/m (0.0008 in + 0.0005 in/ft)
VOLUMETRIC ACCURACY WITH MaxSHOT Next™IElite⁽³⁾	0.020 mm + 0.015 mm/m (0.0008 in + 0.00018 in/ft)		
MEASUREMENT RESOLUTION	0.100 mm (0.0039 in)	0.025 mm (0.0009 in)	
MESH RESOLUTION	0.200 mm (0.0078 in)	0.100 mm (0.0039 in)	
MEASUREMENT RATE	480,000 measurements/s	800,000 measurements/s	1,300,000 measurements/s
LIGHT SOURCE	7 red laser crosses	7 blue laser crosses	11 blue laser crosses (+ 1 extra line)
LASER CLASS	2M (eye safe)		
SCANNING AREA	275 x 250 mm (10.8 x 9.8 in)	310 x 350 mm (12.2 x 13.8 in)	
STAND-OFF DISTANCE	300 mm (11.8 in)		
DEPTH OF FIELD	250 mm (9.8 in)		
PART SIZE RANGE (recommended)	0.1–4 m (0.3–13 ft)	0.05–4 m (0.15–13 ft)	
SOFTWARE	VXelements		
OUTPUT FORMATS	.dae, .fbx, .ma, .obj, .ply, .stl, .txt, .wrl, .x3d, .x3dz, .zpr, .3mf		
COMPATIBLE SOFTWARE⁽⁴⁾	3D Systems (Geomagic® Solutions), InnovMetric Software (PolyWorks), Metrolog/c Group (Metrolog X4), New River Kinematics (Spatial Analyzer), Verisurf, Dassault Systèmes (CATIA V5, SOLIDWORKS), PTC (Creo), Siemens (NX, Solid Edge), Autodesk (Inventor, PowerINSPECT)		
WEIGHT	0.85 kg (1.9 lb)	0.94 kg (2.1 lb)	
DIMENSIONS (LxWxH)	77 x 122 x 294 mm (3.0 x 4.8 x 11.6 in)	79 x 142 x 288 mm (3.1 x 5.6 x 11.3 in)	
CONNECTION STANDARD	1 X USB 3.0		
OPERATING TEMPERATURE RANGE	5–40°C (41–104°F)		
OPERATING HUMIDITY RANGE (non-condensing)	10–90%		
CERTIFICATIONS	EC Compliance (Electromagnetic Compatibility Directive, Low Voltage Directive), compatible with rechargeable batteries (when applicable), IP50, WEEE		
PATENTS	CA 2,600,926, CN 200680014069.3, US 7,912,673, CA 2,656,163, EP (FR, UK, DE) 1,877,726, AU 2006222458, US 8,032,327, JP 4,871,352, US 8,140,295, EP (FR, UK, DE) 2,278,271, EP (FR, UK, DE) 2,230,482, IN 266,573, US 7,487,063, CA 2,529,044, EP (FR, UK, DE) 3,102,908, US 15/114,563, CN 201580007340X		

(1) HandySCAN BLACK and HandySCAN BLACKIElite (ISO 17025 accredited): Based on VDI/VDE 2634 part 3 standard. Probing error performance is assessed with diameter measurements on traceable sphere artefacts.

HandySCAN 307: Typical value for diameter measurement on a calibrated sphere artefact.

(2) HandySCAN BLACK and HandySCAN BLACKIElite (ISO 17025 accredited): Based on VDI/VDE 2634 part 3 standard. Sphere-spacing error is assessed with traceable length artefacts by measuring these at different locations and orientations within the working volume.

HandySCAN 307: Value for spheres spacing measurement on a calibrated length artefact.

(3) The volumetric accuracy of the system when using a MaxSHOT 3D cannot be superior to the default accuracy for a given model.

(4) Also compatible with all major metrology, CAD, and computer graphic software through mesh and point cloud import.