



DEEP CRYOGENIC TREATMENT

Deep Cryogenic Treatment (DCT) lowers the residual stress in cast, forged and machined items. The process converts retained austenite to martensite in steel alloys with grain-level microstructure populating micro-carbides. The tempering stage eliminates hydrogen embrittlement and lowers fatigue crack nucleation and propagation. When applied to metal ground engagement tools in high stress environments such as mining, DCT is proven to increase wear life materially impacting cost, reliability, risk and the carbon impact of supply chains.

The DCT platform designed by **Deep Cryogenics International** for on-site use in the mining, oil & gas and energy industries delivers clear financial and environmental benefits across the balance sheet.



Increase Wear Life

Reduce abrasive wear and corrosion by 20-40%.



Improve Reliability

Increase reliability.
Reduce failure risk.



Reduce Emissions

Lower carbon emissions.
Improve ESG.



Clear & Measurable Benefits

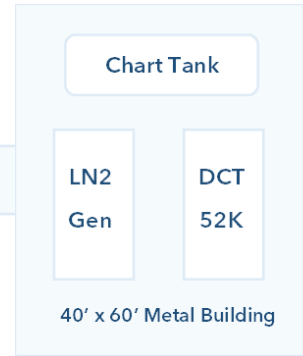
- reduces abrasive wear and corrosion by 20-40%
- improves tensile and yield strength up to 20%
- increases reliability and reduces risk
- extends maintenance intervals and increases uptime
- lowers supply chain carbon emissions and improves ESG profile
- permanent, through-material process that does not wear away

DEEP CRYOGENICS INTERNATIONAL

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DEEP CRYOGENIC TREATMENT PLATFORM



DCT PLATFORM includes:

- 52K DCT Chamber
- 1,500 L/day LN2 Generator System
- 11,000 L Storage Dewar
- Platform Design Stamp
- Installation Layout
- LIBS Material Analyzer
- ETCSA Certification License
- 24-6 Remote Support
- Backup Generator
- FAT and SAT, On-site Training/Manuals

LEASE/PURCHASE OPTIONS: TURNKEY PLATFORM or CHAMBER ONLY

DEEP CRYOGENIC TREATMENT 52K CHAMBER

PRODUCTION	Treat up to 180,000 lbs/mo. of high wear parts
LOW COST	Approximately \$.30/lb to increase item wear life 20-40% Approximately 10% of the original item cost to double the wear life
TURNKEY	Installation, runoff, FAT/SAT, manuals, training, 24-6 support
SAFE DESIGN & OPERATION	Portable and fixed oxygen monitors; AB/BC/ON engineering design stamp
ENVIRONMENTALLY BENIGN	Liquid nitrogen is <i>infinitely renewable and infinitely recyclable</i> [™]
MEETS CODES	CSA B51, CSA 22.1, UL508A, CSA 22.2, ABSA AB-518, CRN and ASME; Made in Canada Act
INTELLECTUAL PROPERTY PROTECTION	Patents - USPTO Design #17/670,895, USPTO Validation Patent # 9,721,258; USPTO Certification Patent #6778168

DIMENSIONS & CAPACITY 9.5' x 7' x 18.5' (2896 mm x 2133 mm x 5638 mm); 45,000 lbs (20,400 kgs)

POWER & CONTROL 110 V, single phase, Siemens S-7 1500 PLC control

TEMPERATURE RANGE -320°F to 300°F (-196°C to 150°C); cryogenic liquid nitrogen, heat-propane forced air

LOADING Forklift load/unload onto dual rollers

CYCLE TIME ~40 hours; unattended operation design

PRECISION Part/air temp thermocouple feedback +/-1°F

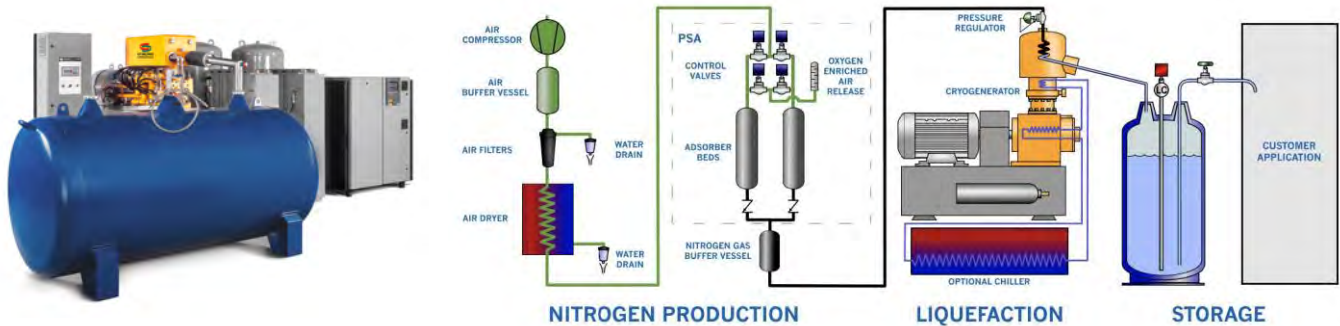
MONITORING Wifi, ethernet, SCADA connectivity

REPORTING Data logging; maintenance & safety functions



LIQUID NITROGEN GENERATOR SYSTEM

DEEP CRYOGENICS INTERNATIONAL System Design



HIGH OUTPUT	1,500 L/day = 4 DCTs/month plus extra LN2 for additional mining operation needs
SAFETY	Oxygen monitoring system with fan-assisted auto-evacuation, remote monitoring and data log; AB/BC/ON engineering design stamped
MEETS CODES	CSA B51, CSA 22.1, UL508A, CSA 22.2, ASME, US/CRN stamp, ANSI CGA P-8.8, OSHA 29 CFR
OPERATION	32° to 110°F in temp controlled enclosure; 70 kW power, 180 amp max current, 72 dBA
NO GHG EMISSIONS	LN2 is <i>infinitely renewable and infinitely recyclable</i> ™
TURNKEY	Installation, runoff, FAT/SAT, manuals, training and 24-6 support
PROPRIETARY FORMULAS	Developed by DCI for 20,000 lb loads of crusher cone mantles and bucket teeth

DESCRIPTION Stirling LN2 generator, Atlas SPC4 Copco GA-15 compressor and PSA, Haskris OPC-15 chiller, 11,000 L Chart storage dewar, Siemens S-7 1500 PLC control

ASSEMBLY Full integration; all wiring and electronics in a 20', 25G1 ISO container

POWER & OUTPUT 480 V/3 ph/50-60 Hz; 1,500 L/day

AT A GLANCE On-site liquid nitrogen plant, automated operation, 5 year warranty

