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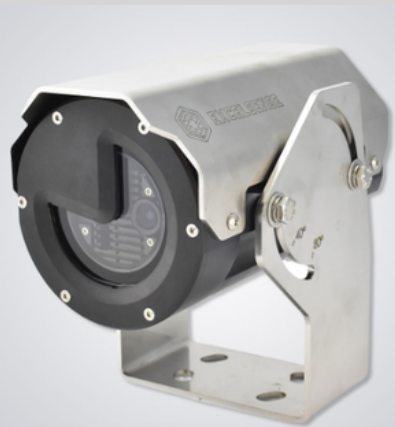
Applications in mining for the new ToughEye self-cleaning cameras:

The camera uses a unique micro-renewable op/cal layer to self-clean the lens without wipers. Effective against abrasive dust, mud, oil, ice (-40C self-thawing) and many other contaminants. Guaranteed to 40,000 cleaning cycles.

No more dirty lenses. The ToughEye needs no maintenance, no fluid or air hoses. No more cleaning lenses.

Guaranteed to 40,000 cleaning cycles. These cameras use a unique micro-renewable op/cal layer to self-clean the lens without wipers. Effective against abrasive dust, mud, oil, ice (-40C self-thawing) and many other contaminants.

ToughEye 1700



MILL & CRUSHER OPTIONS

- Conveyor monitoring (check material transfer points, belts and magnets)
- Stackers and stockpile monitoring
- Continuous crusher/screen/surge bin monitoring
- Truck carry-back monitoring
- Over/under loading monitoring at loading bays
- Processing circuits with dust and inaccessibility
- Crushers
- Eliminate vision problems created by frost, steam and dust.
- Dark, dusty or hard to access locations (built in integrated lighting)

MOBILE FLEETS

- Elevate safety & awareness
- Haul truck back up cameras to prevent 8re damage
- 360 continuous operator view
- Autonomous trucks - preview/verify issues on haul road to reduce/shorten stoppages
- Rear back up camera to eliminate tire damage/elevate safety awareness
- Graders - 360 vision
- Dozers - 360 vision



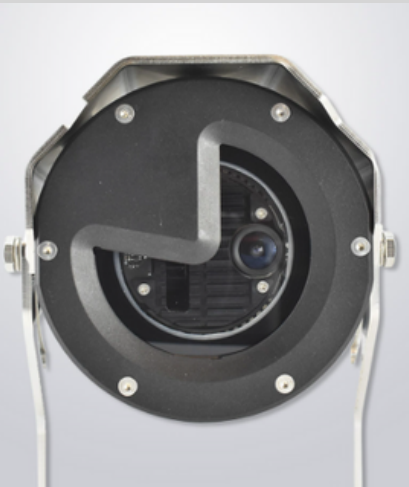
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DRILL RIG OPERATIONS

- Eagle's view of deck area (fork, break out wrench); 360 degree scan
- View drill rod/rotary gate/gear box from top of mast for proper engagement/rod bend or wobble
- View storage carousel for proper engagement
- View over rear motor -fire monitor
- Check location of gear box
- View rod support system
- View cable spool wind-up
- Monitor drill bit hole
- 360 degree view for tramming



UNDERGROUND OPERATIONS

- Remote or line-of-sight mucking / scoop trams, eliminate steel on steel collisions
- Monitor loading pockets (in shafts)
- Rock breaker and grizzly monitoring
- Portal exit frosting (self-thawing)
- Self clean back-fill splatter
- Monitor level transfer
- Monitor draw points for blockages (block cave) (too dusty for lasers)
- Safety and awareness
- Eliminate vision problems created by frost, steam and dust.
- Dark, dusty or hard to access locations (built in integrated lighting)



EXPLORATION DRILLING

- Look at critical areas to keep personnel safe

SITE SECURITY

- Site surveillance and security



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The ToughEye is a low cost & simple blast hole drilling safety and awareness system. For placement in dirty, dusty and greasy locations to get clear vision.

Integrates with existing OEM displays. IP and analogue configuration – remote visibility via site network.

Each ToughEye installed to date is still in operation (7 years and >300,000 cleaning cycles).

Zero maintenance, no fluid or air hoses, no manual cleaning.

Watch a video of the self-cleaning lens: TE-1700 Video <https://team-marathon.com/video-tougheye-1700>



SensorShield 1600

The SensorShield-1600 converts existing cameras into self-cleaning:

- Existing cameras
- PTZ cameras
- LiDAR laser scanners
- Distance sensors

ToughEye 1000

ToughEye-1000 standard (non-self cleaning) camera is available so you only need to work with a single camera vendor.



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QUICK SUMMARY OF APPLICATIONS FOR TOUGHEYE SELF-CLEANING CAMERA SYSTEMS:

The ToughEye is a low cost & simple blast hole drilling, mobile fleet and material handling safety and awareness system, using a patented self-cleaning mechanism without the need for fluid or air:

Blast hole drill operations:

Monitoring rotary head, rack/pinion, cross-thread of pipes, cable winding, motor, drill hole.

Mobile fleet operations:

360-degree uninterrupted vision & safety enhancement.

Mill & crusher operations:

Monitoring material transfer points, dark/dusty locations, stacker, crusher and rock breaker.

Underground operations:

Mucking/scoop trams, grizzly, level transfer, safety and awareness.

Exploration drilling:

Look at critical areas to keep personnel safe.



How does ToughEye's patented self-cleaning mechanism work without needing fluid refills or compressed air?

The patented technologies in ExcelSense cameras take inspiration from the human eye. The same way our eyes always stay clear, even in a dusty environment without any manual cleaning. More importantly, the dust in the air may be many times harder and more abrasive than the surface of our eyes, yet we don't end up injuring our eyes when we blink. ToughEye cameras can be thought of as a 1000 times more rugged version of a human eye. The lens on a ToughEye camera features a re-condition-able optical micro-surface. The micro-surface gets reconditioned through a patented internal process concurrent with a cleaning cycle. As the lens surface reemerges back out, the microscopic surface inhibits bonding of contaminants to the lens, allowing the continued movement of the lens to safely separate the contaminants without rubbing the contaminants against the lens, which would cause scratching.

How do you trigger the cleaning cycle on ToughEye 1700?

There are several ways to trigger a cleaning cycle. ToughEye 1700™ can be triggered:

1. Through a software network command (http command)
2. By activating the internal timer of the camera through its web interface or http network command
3. setting a cleaning schedule through the camera's web graphical interface; a browser is all that is needed; no proprietary software needed
4. By providing an electrical pulse; this may be in the form of a physical button/PLC/relay or from a signal on the equipment (ie. reverse gear signal for backup camera).