

## Automatic Slag Detection and Reduction of Slag Carry-over in Steel Tapping Processes

### THE TASK

#### Reliable and automatic slag detection and measurement of slag and steel percentages

The process of tapping liquid steel ends in rapid increase of the levels of slag in steel/metal. Quick termination of the tap after the alarm has been triggered is necessary to prevent excessive slag in the target ladle. Reliable slag detection is important for primary and secondary steel making processes, Basic Oxygen Furnace (BOF) and Electric Arc furnace (EAF) vessels, stainless steel production and can also be used in other smelting operations involving copper and platinum.

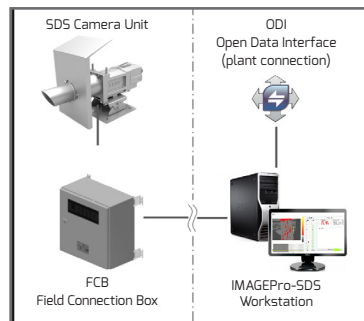
### THE SOLUTION

#### SDS-640 dedicated thermal imaging systems for automated slag detection and control

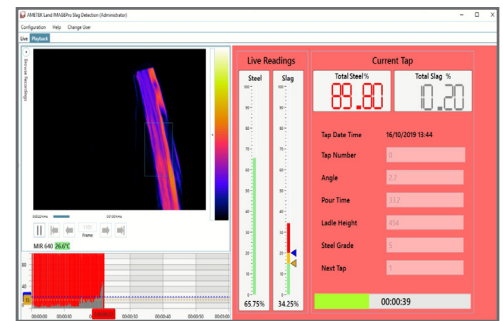
The AMETEK Land Slag Detection System uses a specialised, high-resolution thermal imaging camera to detect the transition of steel/metal and slag. SDS V2 has been specifically designed to survive in harsh operating conditions. It utilises a particular spectral response to reduce obscuration caused by the smoke and fumes present in most tapping processes. Using the updated IMAGEPro-SDS V2 thermal imaging and slag detection software, a tap recording can be initiated by automatic tap detection or external triggers. The slag and steel/metal levels are presented to the operator in real time enabling them to make informed decisions about the tapping process. The system provides clear alarm notifications to automatically control and stop the tapping process on pre-defined threshold levels. Data recordings and thermal imager videos and images are archived for quality purposes.



SDS V2 imager with heavy industrial enclosure



System Overview

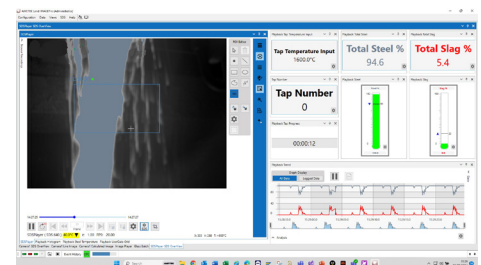


IMAGEPro-SDS Application Software

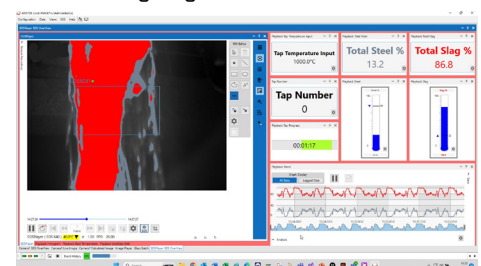
### BENEFITS

#### Advantages for the end user

- Powerful detection system prevents slag carry over**  
 lower slag content improves steel quality, reducing energy costs by up to 25% compared to traditional methods of stream monitoring
- Clear alarm notification**  
 alarms generated by the system directly stop the tap before slag carry-over
- High resolution imaging in a harsh environment**  
 the narrow spectral response and high resolution of the SDS V2 thermal imager provide clear images even with smoke and fumes present
- Cost and risk reduction**  
 remote operation avoids personal risk and reduces maintenance of BOF / EAF vessels
- Automatic stream tracking**  
 automatic stream identification and accurate tracking guarantees consistent slag detection ensuring high product quality
- Full connectivity**  
 improved connectivity through the use of Open Data Interface, multiple I/O-modules, Modbus TCP and OPC UA



Rising slag content is monitored



Alarm has been triggered to stop the tap