

Steel Strip Defect Identification



Client

Our client is a fully integrated flat carbon steel manufacturer based in India– from iron ore to ready-to-market products – with a current capacity of 10 million tonnes per annum (MTPA). Their steel manufacturing facility comprises ore beneficiation, pellet making, iron making, steel

making, and downstream facilities including cold rolling mill, galvanising, pre-coated facility, steel processing facility, extra wide plate mill and a pipe mill.

Problem Faced

- Examining surface defects on hot steel strips inside their factory's CSM (Compact Strip Mill).
- Each strip has a temperature of 600 to 900°C, making the inspection process extremely difficult.

Technology introduced by Qualitas Technologies

Artificial Intelligence & Deep Neural Network in Image processing helps in optimal decision making & generating accurate results. Compared to traditional classification algorithms, AI-based classification is far more accurate, resulting in 100% accuracy. Not only is it more accurate, but it's very easy to maintain and update when new variants need to be added to the recognizable variant list.



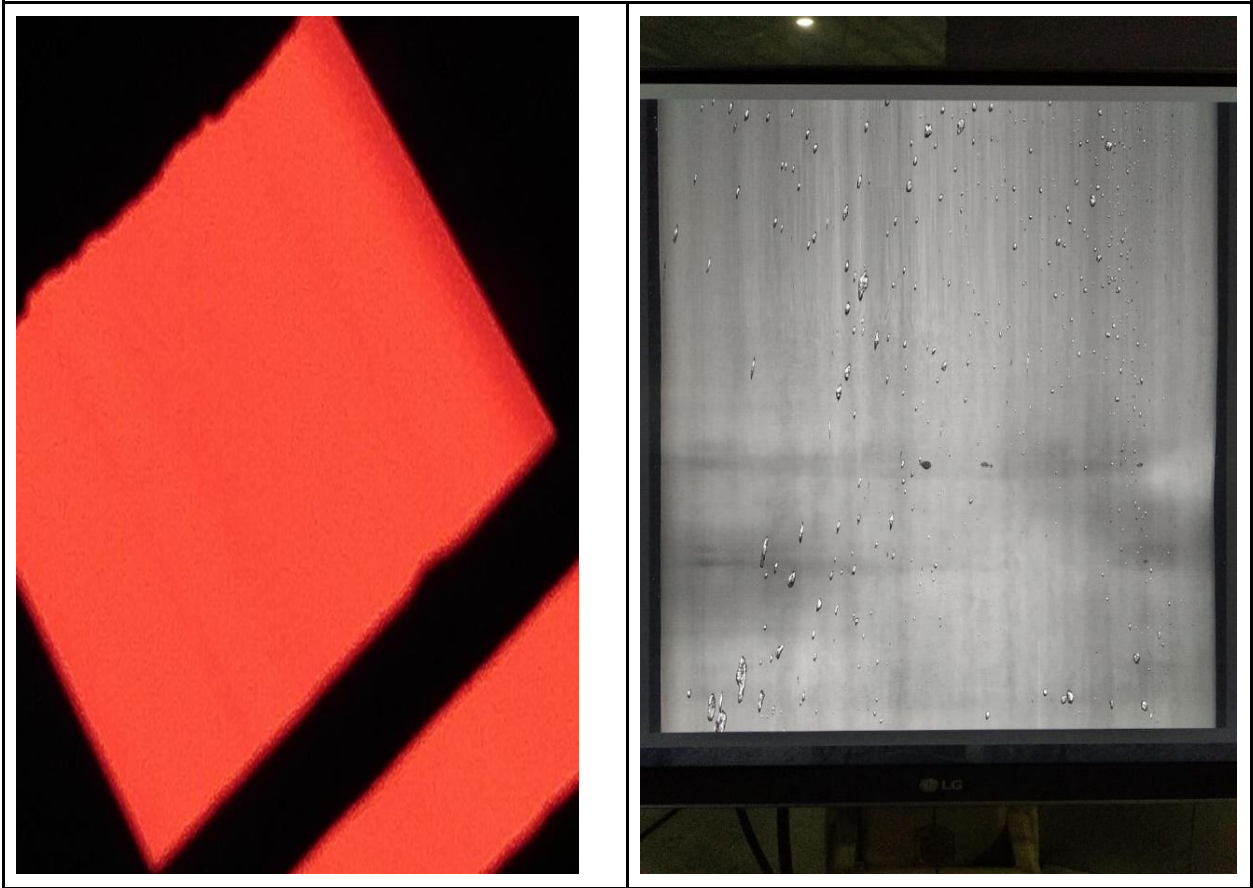
Solution

- A high-resolution image is captured by 8K line scan camera in binning mode, Result image will have 2MM pixel accuracy with 20 Microns pixel size
- Image Size: 16Mb. 4096 x 4096 Pixels. FOV: 2000 x 2000
- Though strip is red hot & emits radiation, High-intensity line light flare will enable us to overcome the radiation & strip looks as it is in room temperature
- IPC with a frame grabber & 10GBPS network card will acquire 7.5 Gb data per minute & transmit the same to the server through a 10GBPS network card.

Images

<i>Original Image</i>	<i>Camera Image</i>
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NOTE:- The original image is the standard image of the hot metal sheet as captured by a standard camera, the Camera Image denotes the image taken by the setup installed by Qualitas. As we can see, the defects are clearly visible.

Results

High-speed image acquisition setup installation is successfully completed & the customer is able to do the data collection without missing & defect. More than 120000 strips were inspected in the given setup.

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