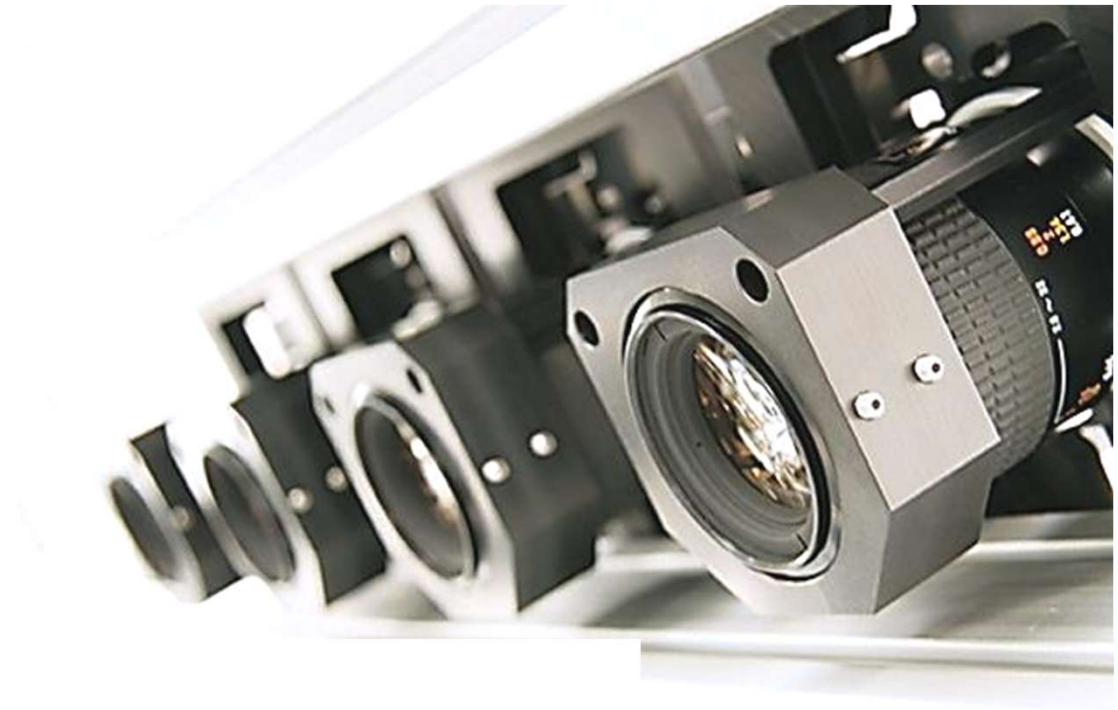


Dr Schenk

**Advanced Surface
Inspection & Surface
Analysis Solutions**



INTERNATIONAL WROUGHT COPPER COUNCIL

Dallas TX





IWCC Legal Disclaimer The purpose of this presentation is to guide programs benefiting the copper industry and to provide attendees with information to make independent business decisions.

Industry Recap



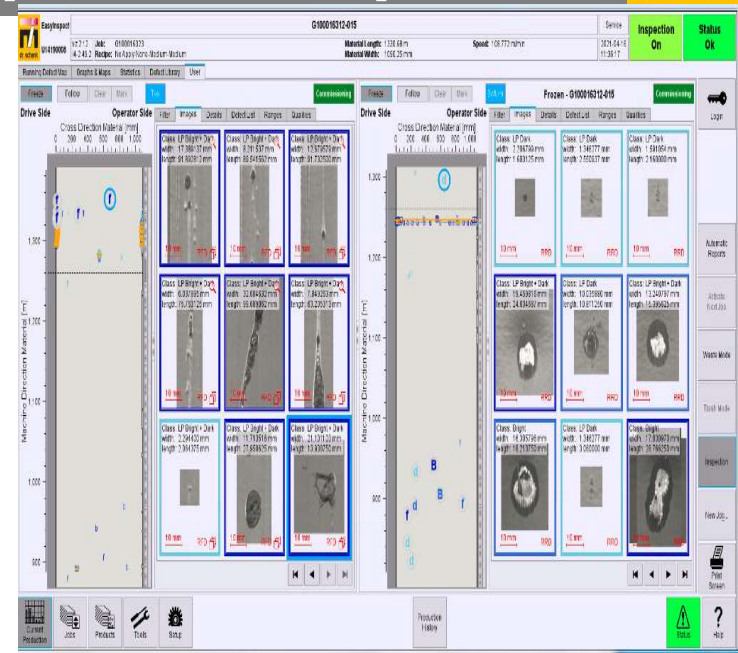
- **Automated Surface Inspection Has Been Serving The Metals Industry For About 35 years**
- **1st Generation** = Mid to Late 90's, Massive, Hardware Based Machines
 - 1MUSD + Per Machine
 - Handful Per Year Were Purchased (Mainly By R&D Types)
 - Expectations Were Very High – And Seldom Met
 - But The Technology Did Show Promise
- **2nd Generation** = Early 2000's, to Mid Teens, PC's Replaced Costly Hardware
 - \$500K Average Per Machine
 - One Or Two Inspection Views
 - Self Learning Classifiers
 - Technology Generally Accepted
- **3rd Generation** = Around 2017 Through Today, High Speed Electronics, Smart Cameras
 - \$400K Average Per Machine
 - Multiple Inspection Views
 - Artificial Intelligence

Today, Leading Suppliers Are Shipping Thousands Of Surface Inspection Systems Per Year / Capabilities Are Higher Than Ever And For Most Metals Applications, Surface Inspection Is Now A **“Must Have Device”**

Schenk Vision – The Surface Inspection Expert



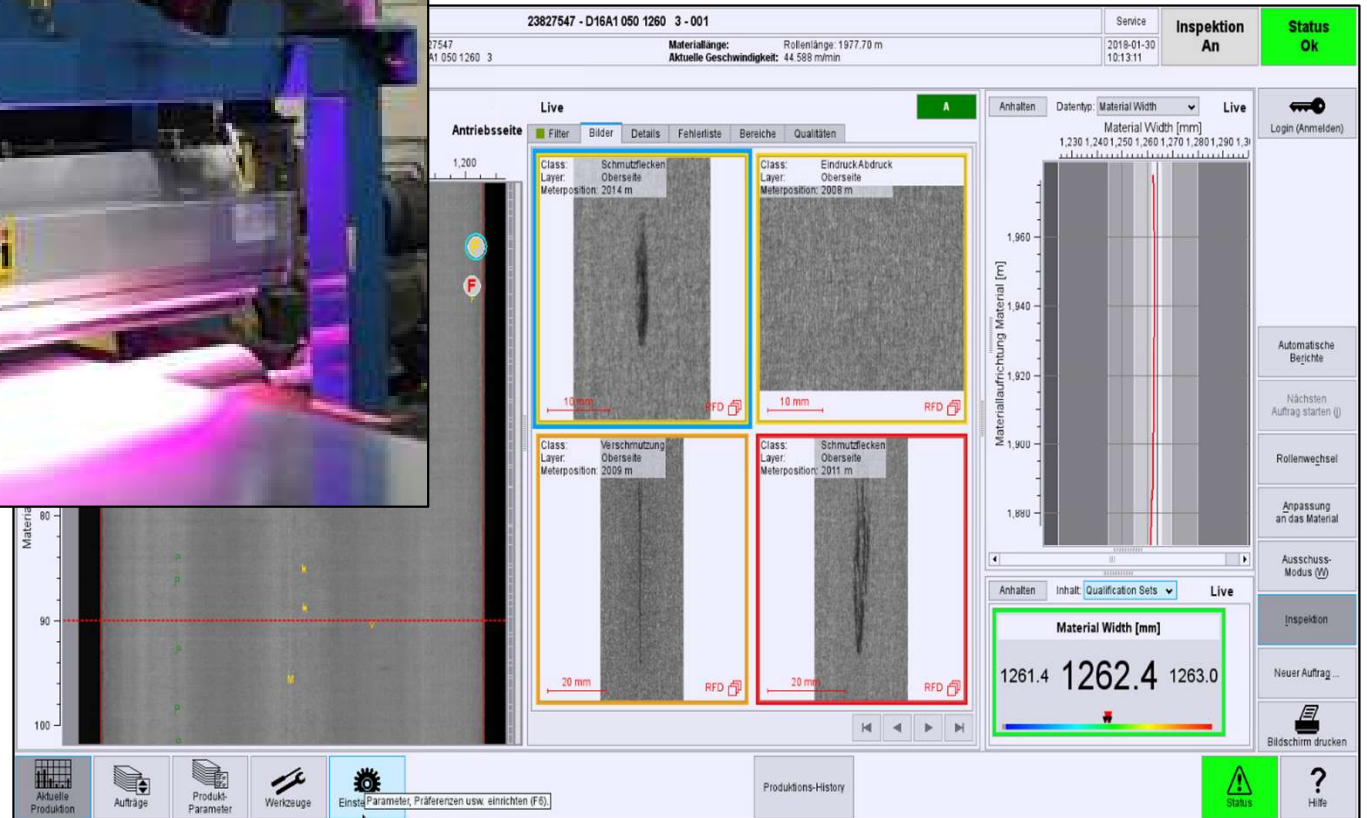
- 100% Inspection **At Full Line Speed**
- Defects displayed on a running map
- Every defect is photographed
- Every defect is classified
- Every defect is recorded at exact x-y location
- The system can trigger external markers, printers, reject gates, etc..
- Every coil (and mult) is graded with Pass, Fail, Hold
- The results of every coil are archived
- All data is stored in open database format
- Reports for every coil (or groups of coils) are at you finger tips



Schenk Vision – The Surface Inspection Expert



Industry Leading Innovative Technology



AI Helps Generate Immediate Results



EasyInspect **G100016312-015** Service Inspection On Status Ok

U14190008 viz.2.12 Job: G100016323 Material Length: 1330.68 m Speed: 108.772 m/min
i4-2.49.2 Recipe: No Apply-None-Medium-Medium Material Width: 1090.25 mm

Running Defect Map Graphs & Maps Statistics Defect Library User

Freeze Follow Clear Mark Top Commissioning

Drive Side Operator Side Filter Images Details Defect List Ranges Qualities

Cross Direction Material [mm] 0 200 400 600 800 1,000

Machine Direction Material [m] 1,300 1,200 1,100 1,000 900

Class: LP Bright + Dark width: 17.389137 mm length: 91.892812 mm	Class: LP Bright + Dark width: 8.211537 mm length: 89.541562 mm	Class: LP Bright + Dark width: 12.679579 mm length: 91.732500 mm
Class: LP Bright + Dark width: 6.037895 mm length: 75.763125 mm	Class: LP Bright + Dark width: 32.604632 mm length: 99.689062 mm	Class: LP Bright + Dark width: 7.849263 mm length: 63.205313 mm
Class: LP Bright + Dark width: 2.294400 mm length: 2.064375 mm	Class: LP Bright + Dark width: 11.713516 mm length: 27.950625 mm	Class: LP Bright + Dark width: 21.101103 mm length: 13.938750 mm

10 mm RFD

Freeze Follow Clear Mark Bottom Commissioning

Drive Side Operator Side Filter Images Details Defect List Ranges Qualities

Cross Direction Material [mm] 0 200 400 600 800 1,000

Machine Direction Material [m] 1,300 1,200 1,100 1,000 900

Class: LP Dark width: 2.206799 mm length: 1.603125 mm	Class: LP Dark width: 1.346277 mm length: 2.550937 mm	Class: LP Dark width: 1.591054 mm length: 2.160000 mm
Class: LP Bright + Dark width: 19.459816 mm length: 24.634687 mm	Class: LP Dark width: 10.035880 mm length: 10.811250 mm	Class: LP Bright + Dark width: 13.240797 mm length: 15.395625 mm
Class: Bright width: 16.305796 mm length: 18.213750 mm	Class: LP Dark width: 1.346277 mm length: 3.060000 mm	Class: Bright width: 17.030970 mm length: 28.766250 mm

10 mm RRD

Current Production Jobs Products Tools Setup Production History Status Help

Automatic Reports Activate Next Job Waste Mode Trash Mode Inspection New Job... Print Screen

First Day After Startup

How Valuable Is Your Inspection System Data?



It Should Be Some Of The Most Valuable Data In Your Plant

- Feed back information for in process changes.
- Feed information forward to next process line.
- Change work rolls...to stop “printing” repeaters.
- Stop adding value to defective material.
- Reroute from “prime” to “non-prime” or vice-versa.
- Protect the end user from turning defective material into parts.
- Justify claims to your suppliers.

Where Is Your Biggest ROI?

What Makes It Less Valuable??

- **ESCAPES** - defects too small, too low contrast or too difficult to reliably detect. Requires manual re-inspection just to be sure you are protecting the “next customer”
- **Mis-Classified Defects** – inspection system not capable to reliably classify defects one from the other...becomes a “**picture taker**”, requires someone to review every inspection file and make final disposition on every coil
- **Long, Drawn - Out Commissioning Periods** - system training / teaching...No ROI for months (year?)

How Can We Make The Data More Valuable??

- DESIGN A SYSTEM THAT IS SMART ENOUGH TO AUTOMATICALLY LEARN YOUR MATERIAL, MAKE REAL-TIME ADJUSTMENTS TO SENSITIVITY TO ENSURE OPTIMAL DEFECT DETECTION

How Can We Make The Data More Valuable??

- DESIGN A SYSTEM THAT IS SMART ENOUGH TO PROVIDE A **PASS, FAIL OR HOLD** INDICATION AT THE END OF EVERY COIL.
 - **Automatic Coil Grading**
 - **Requires confidence** in defect detection (eliminate escapes)
 - **Requires confidence** in defect classification (accuracy increases with detection data from multiple channels)

Schenk Vision / **Advanced Surface Inspection Through Artificial Intelligence and Innovative Optics**

MIDA-X AI

Designed to enhance defect detection and improve classification accuracy



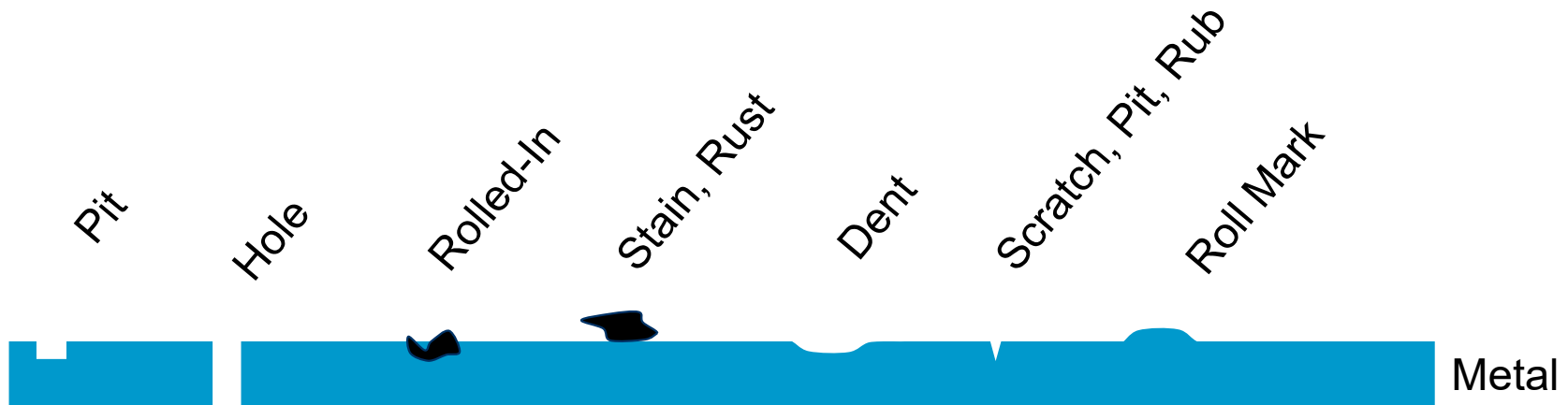
MIDA-X AI

Reduces on-site commissioning time and accelerates your ROI by self learning your product

Defect Detection And Surface Uniformity Analysis

Examples of local defects

Metal *Inspect*



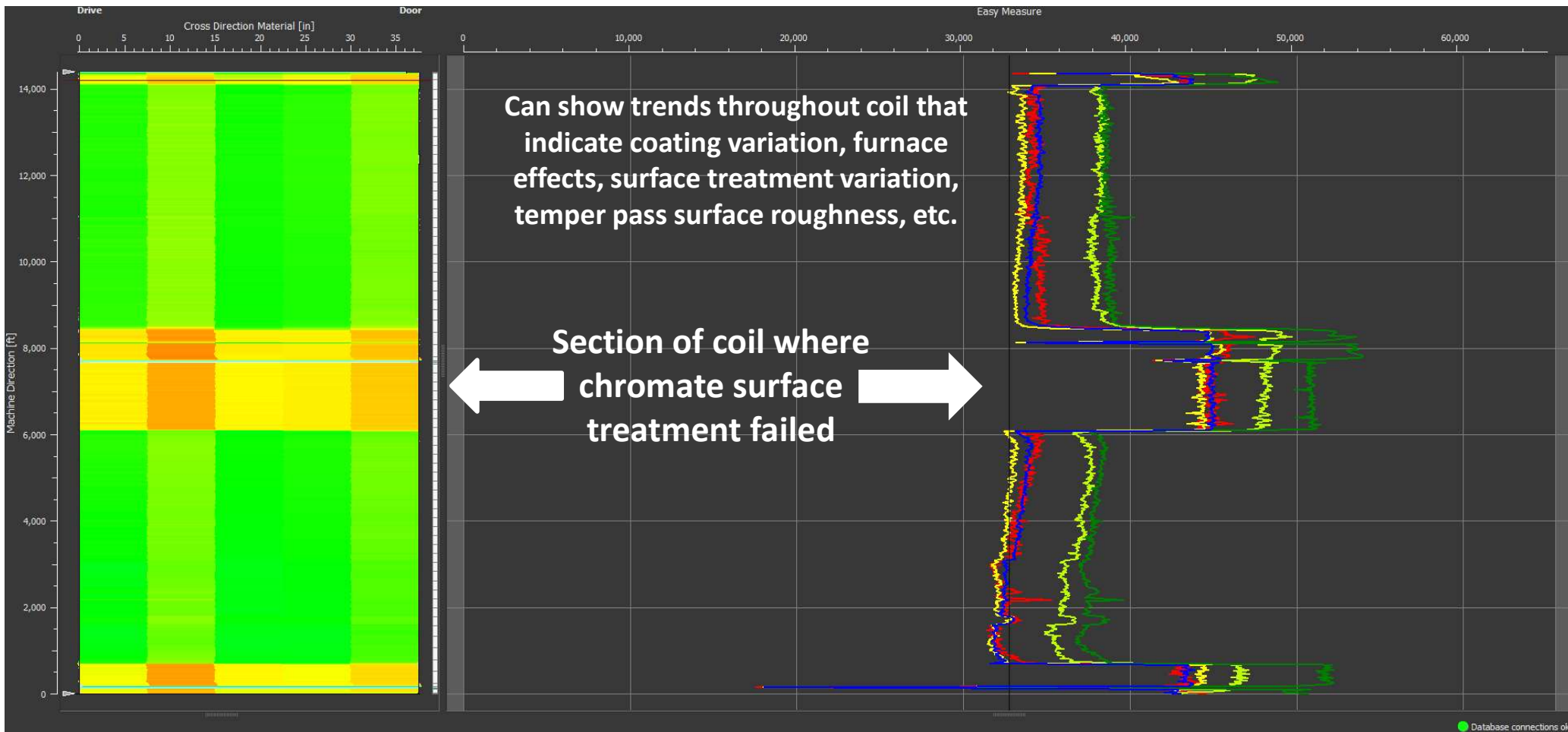
Examples of surface characteristics

Metal *Measure*

Variation in layer surface topology (e.g. roughness, coating thickness variation)



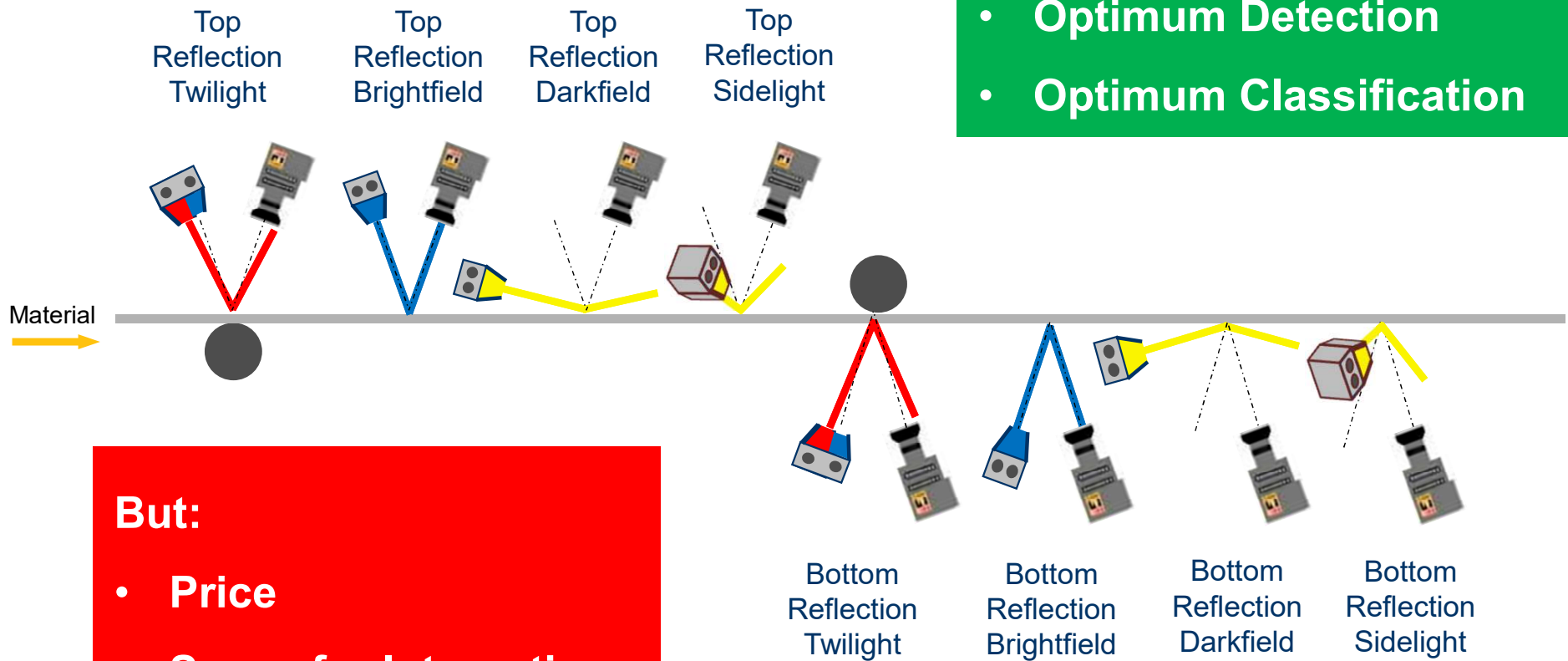
MetalMeasure (Surface Uniformity Analysis)



Trigger on Out Of Tolerance And “UPSET” Conditions Based On Changes In Uniformity

Ultimate Inspection System Design

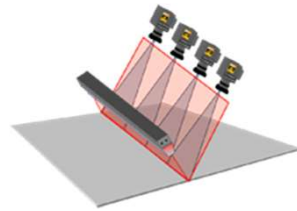
- 8 Channels (Views)
- Optimum Detection
- Optimum Classification



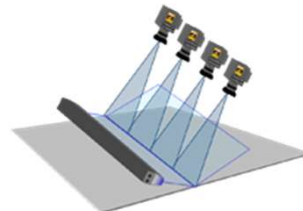
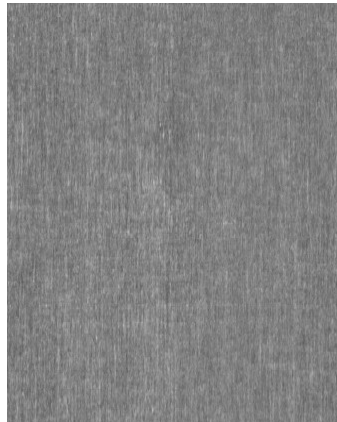
But:

- Price
- Space for Integration

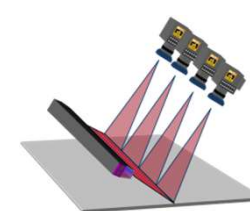
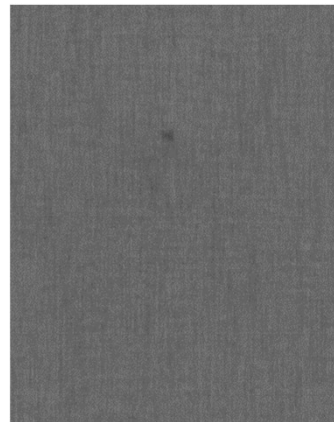
THE VALUE OF MULTIPLE INSPECTION CHANNELS



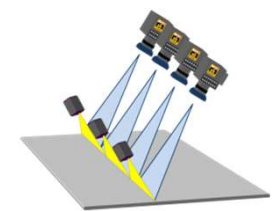
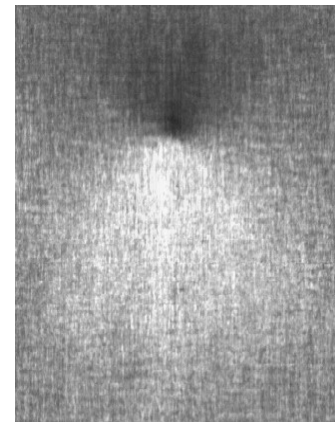
Brightfield



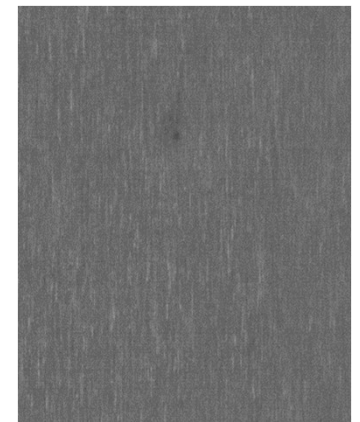
Darkfield



Virtual 3D



Side Lighting

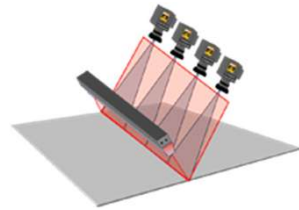


Defect
Type

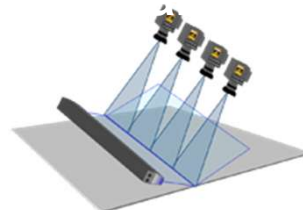


Advanced Detection and Classification

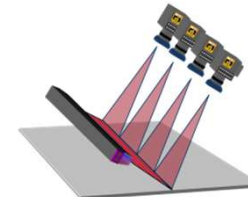
THE VALUE OF MULTIPLE INSPECTION CHANNELS



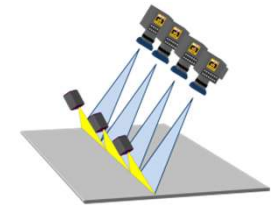
Brightfield



Darkfield



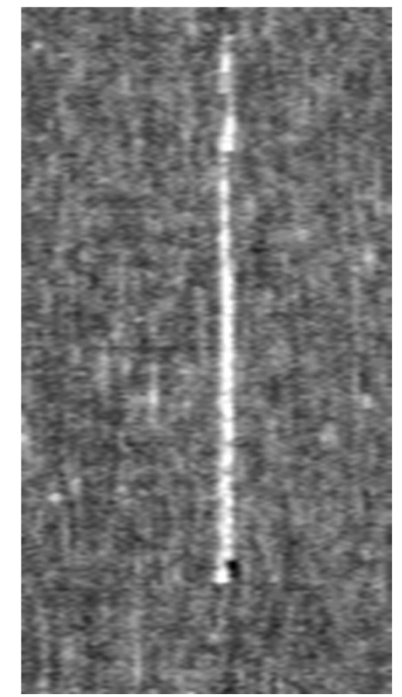
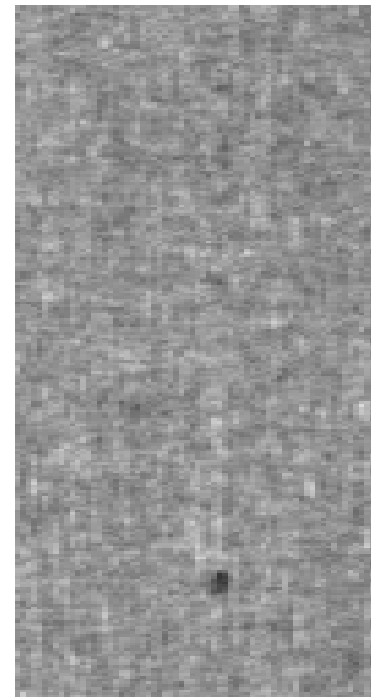
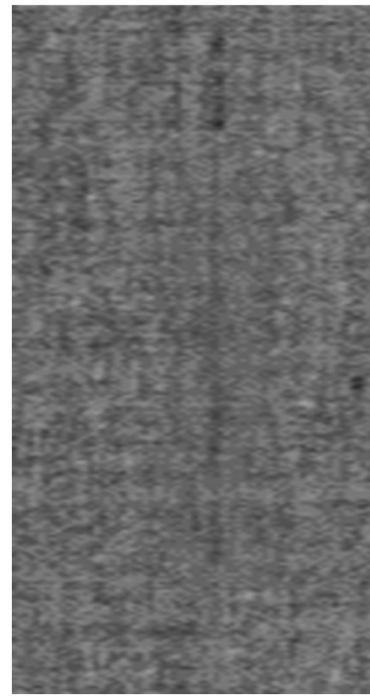
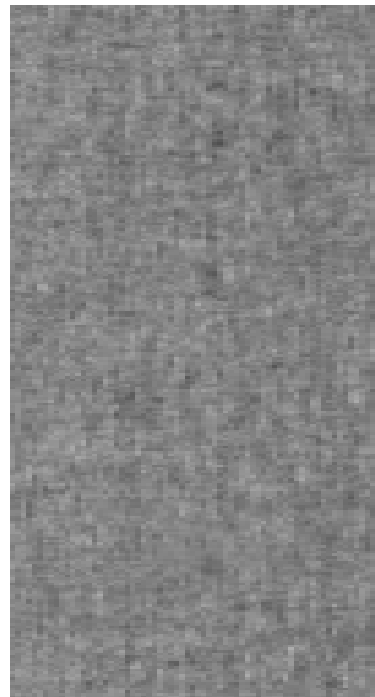
Virtual 3D



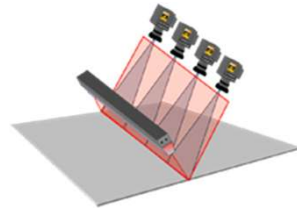
Side Lighting

Defect
Type

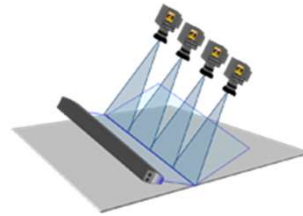
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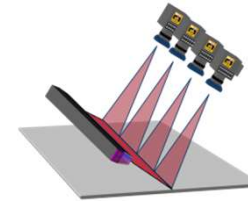
Detection And Classification: Critical vs. Uncritical Defects



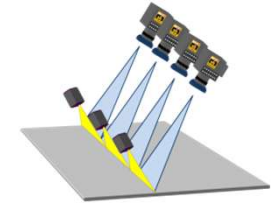
Brightfield



Darkfield



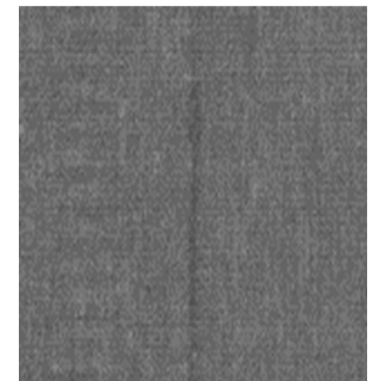
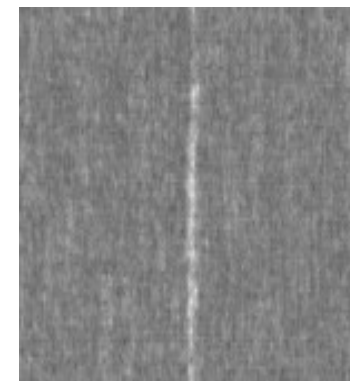
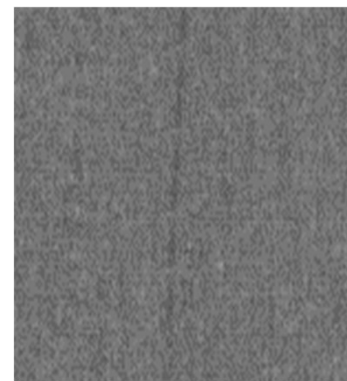
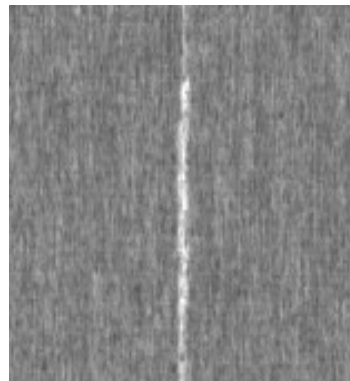
Virtual 3D



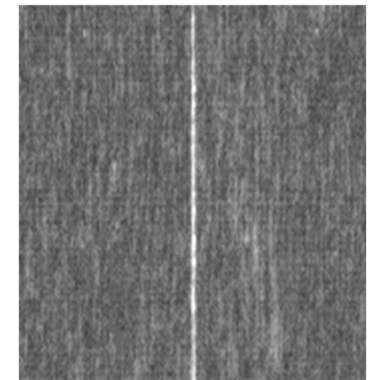
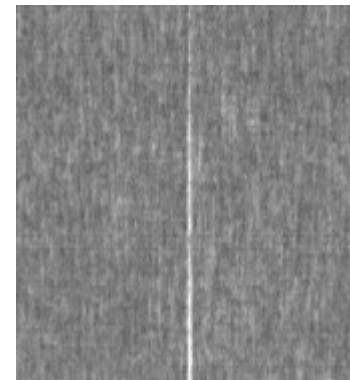
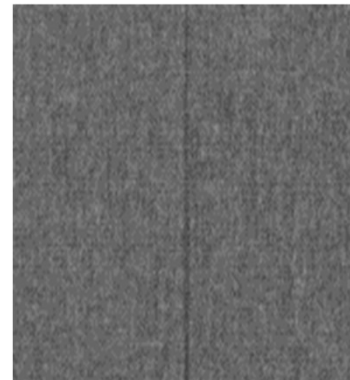
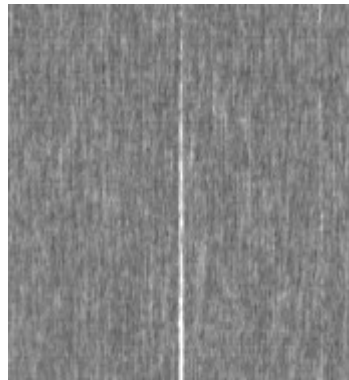
Side Lighting

Defect Type

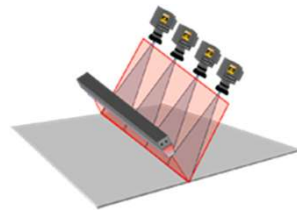
Shiny Streak
(uncritical)



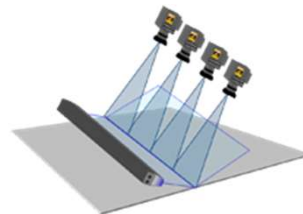
Scratch
(critical)



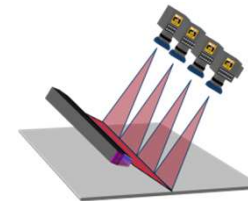
THE VALUE OF MULTIPLE INSPECTION CHANNELS



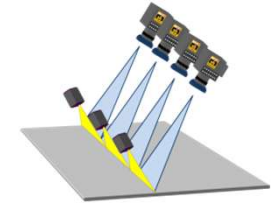
Brightfield



Darkfield



Virtual 3D

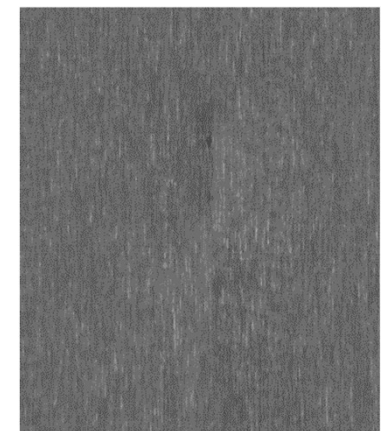
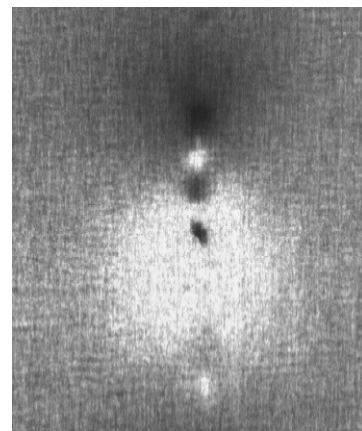
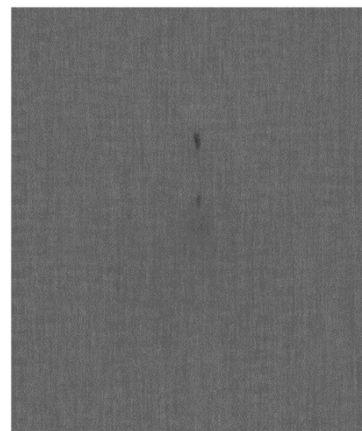
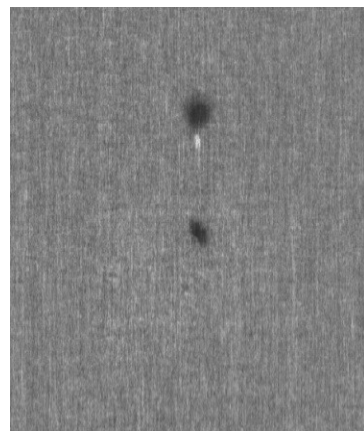
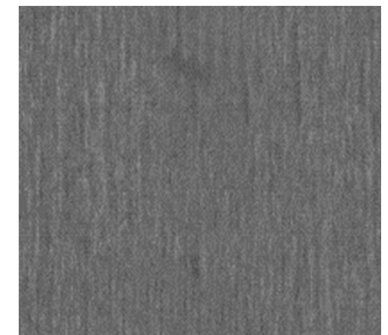
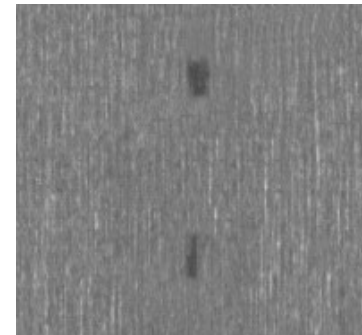
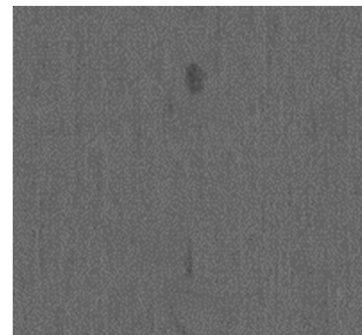
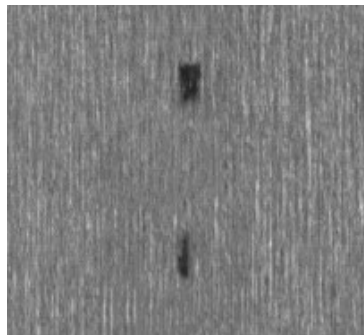


Side Lighting

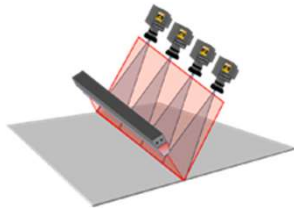
Defect
Type

Dirt

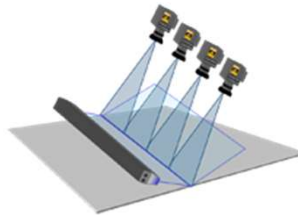
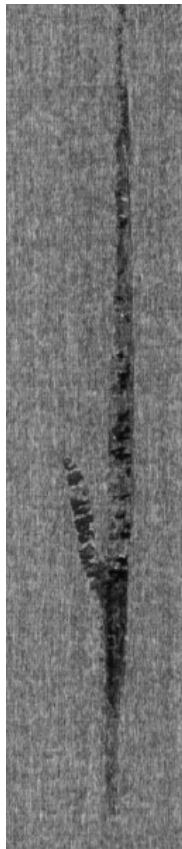
Dent



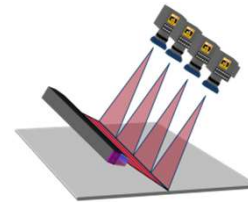
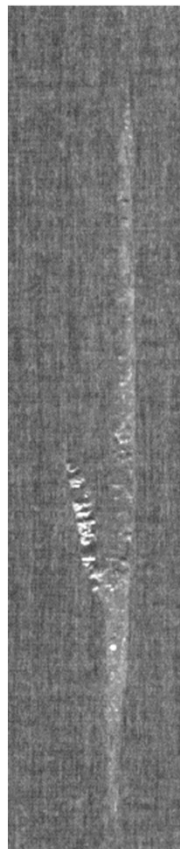
HIGH QUALITY DEFECT IMAGES



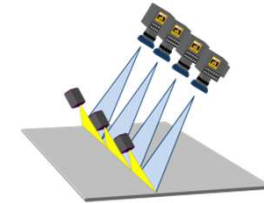
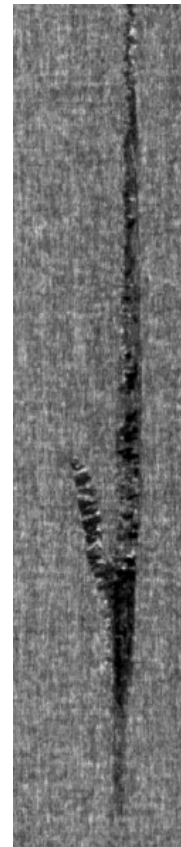
Brightfield



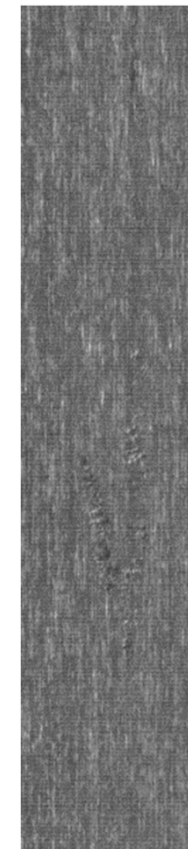
Darkfield



Virtual 3D

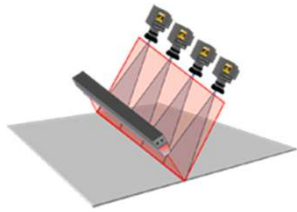


Side Lighting

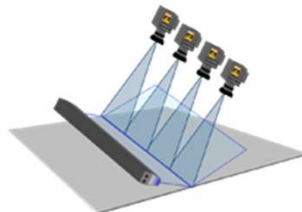


Defect: Lamination

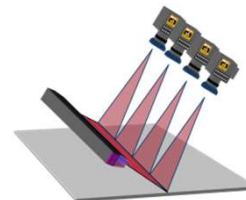
HIGH QUALITY DEFECT IMAGES



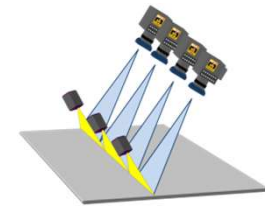
Brightfield



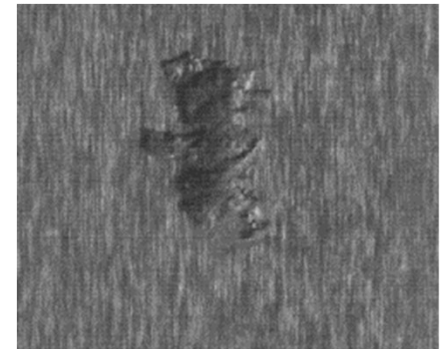
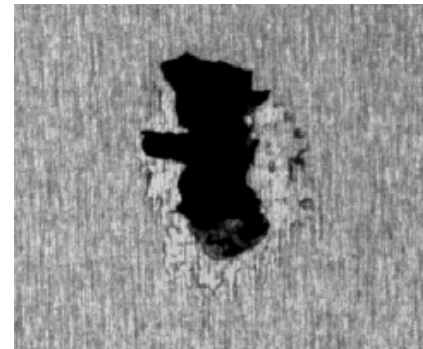
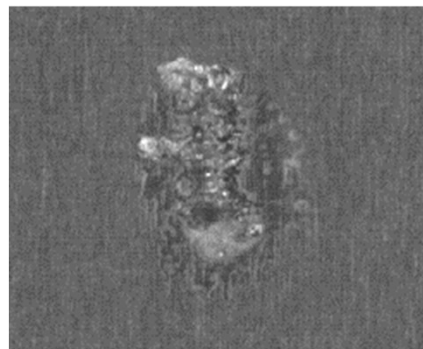
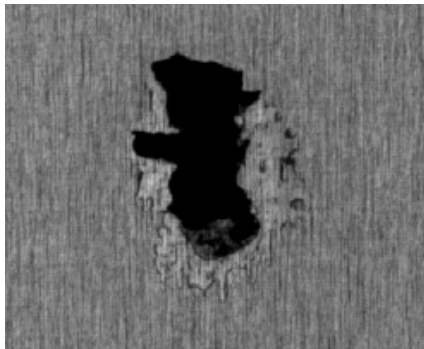
Darkfield



Virtual 3D



Side Lighting



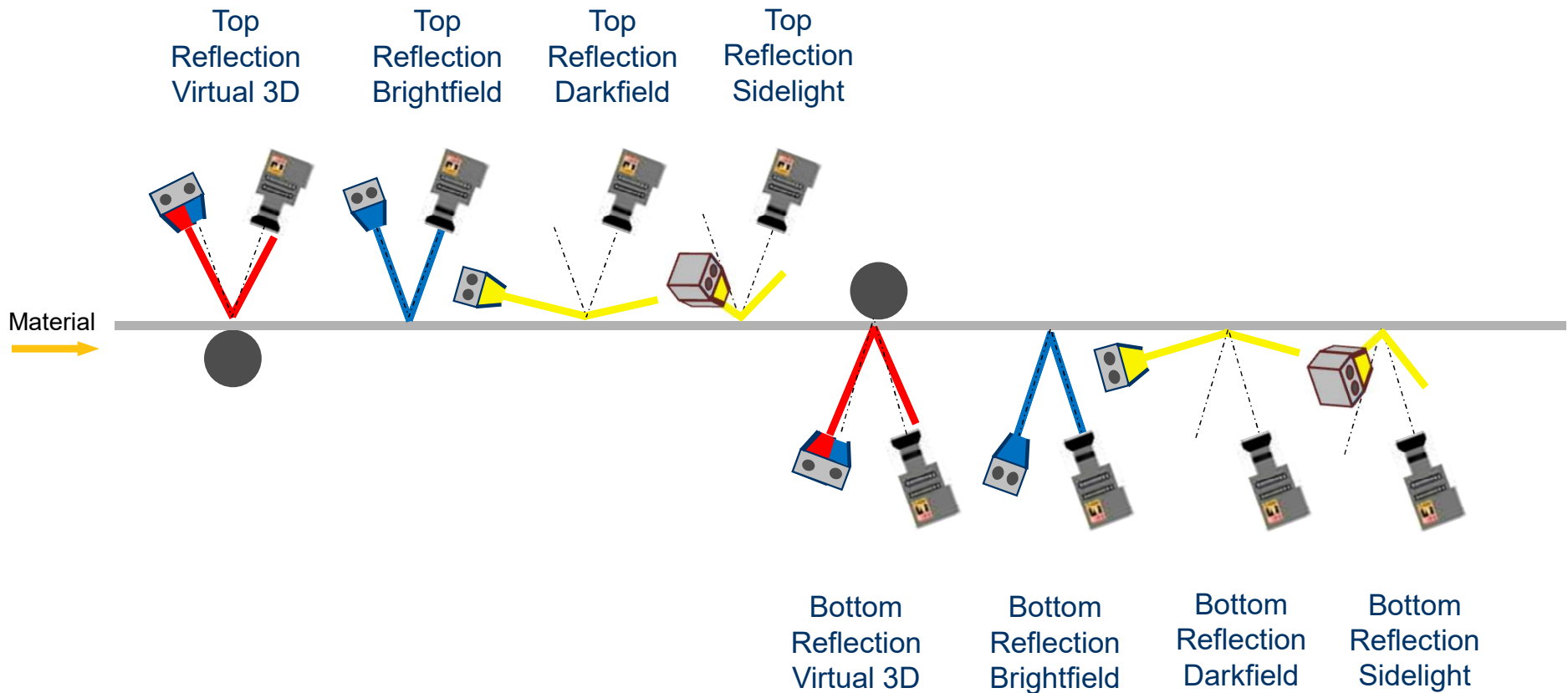
Defect: Scab

In 2018 Dr Schenk Introduced Innovative Optics

MIDA

Multiple Image Defect Analysis

8 Channels (Views) Inspection System

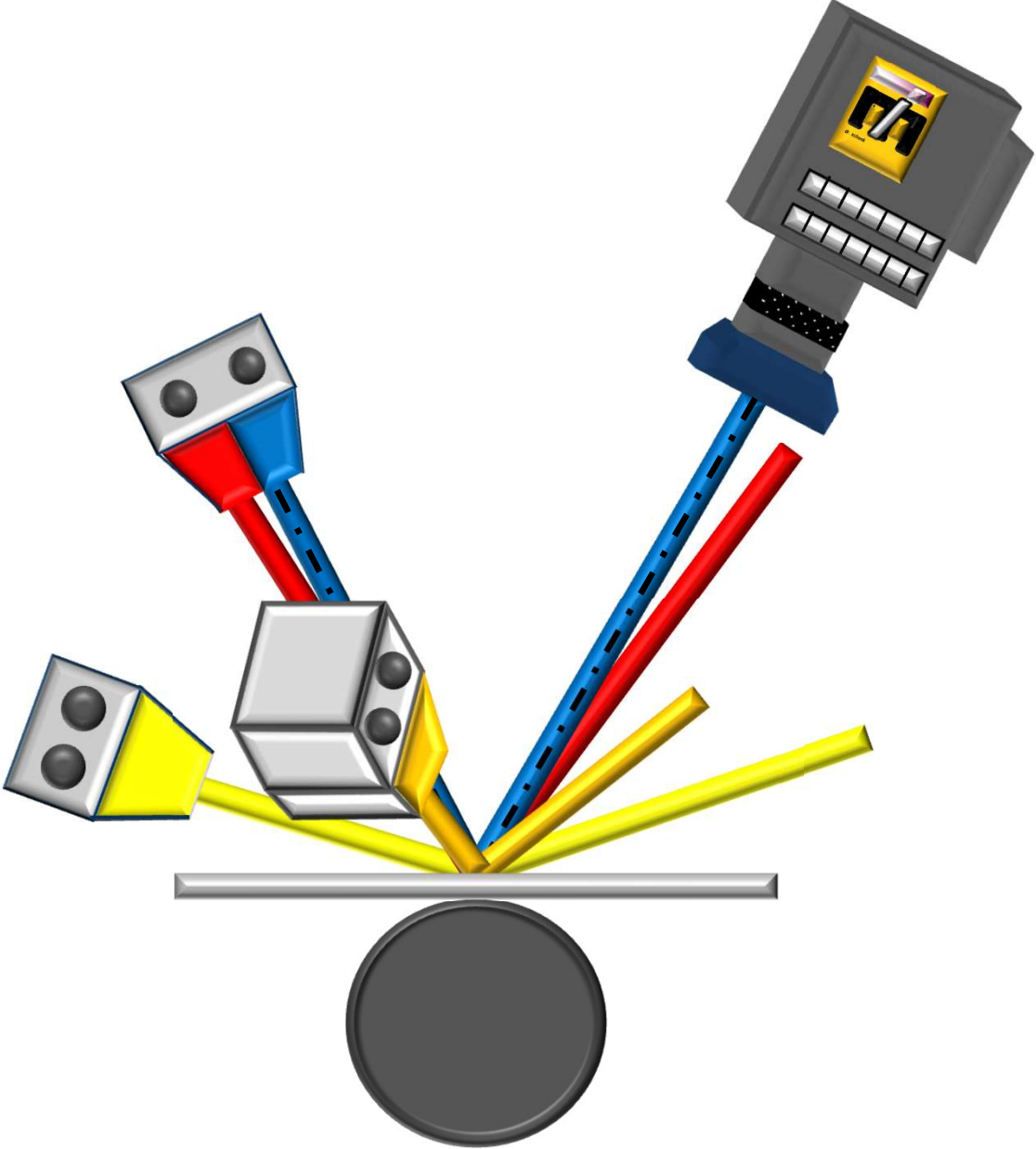


UNIQUE INNOVATION FROM SCHENK VISION



- Up to 4 Channels Per Side (Views)
- Optimum Detection
- Optimum Classification
- Competitive Pricing
- Reduced Footprint

MIDA: Multiple Image Defect Analysis



MIDA → MIDA X: Closing the Intelligence Gap



Knowledge →

Visual Intelligence →

MIDA

WE WERE HERE

The **1st** revolution in optical inspection



MIDA X
neXt generation

NOW WE'RE HERE

The **2nd** revolution in optical inspection



Hardware

Multi-Processor Technology

Multi-CPU / GPU Architecture

”Brain Power“

Software

Multi-threading capability

Architecture EXPLOITS hardware optimally

Artificial Intelligence In The Cameras

Where MIDA Represents The **Physical** Inspection Channels

MIDA-X Represents **Virtual** Inspection Channels – Riding On Top Of Each Physical Channel

MIDA-X Gives The System **“A Second Look”** At Every Defect (How Often In Life Do We Get A Second Chance)?

MIDA-X **Enhances And Corrects What The Physical Channels See** And Sends This Enhanced Information To The Classifier Engines

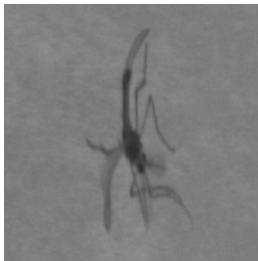
RESULT = Increased Detection Capability, Increased Classification Accuracy And Coil Grading That You Can Be **Confident In!**

Artificial Intelligence Provides Additional Advantages

Setting The Detection Sensitivity Of An Inspection System Has Always Been A Time Consuming Task

The Artificial Intelligence In MIDA-X Also Automatically Adjusts Detection Sensitivity / Greatly Simplifying

The Startup Process And Decreasing Commissioning Time By 25%



**Cameras and Lights
Produce This Picture –
How Do We Determine
What It Is?**

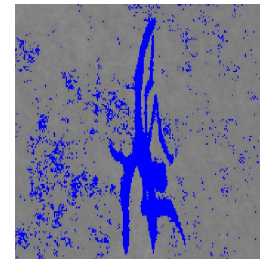
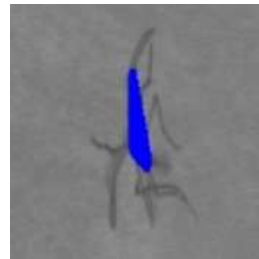


Class: Insect!

2. Manual Sensitivity Adjustment:

yields multiple results

→ Too loose = Under Detect / Too Tight = Over Detect



3. AI Solution: MIDA-X Automatically Adjusts Optimal Sensitivity

→ exactly what you need



Installation / Dr Schenk Custom Built Frame



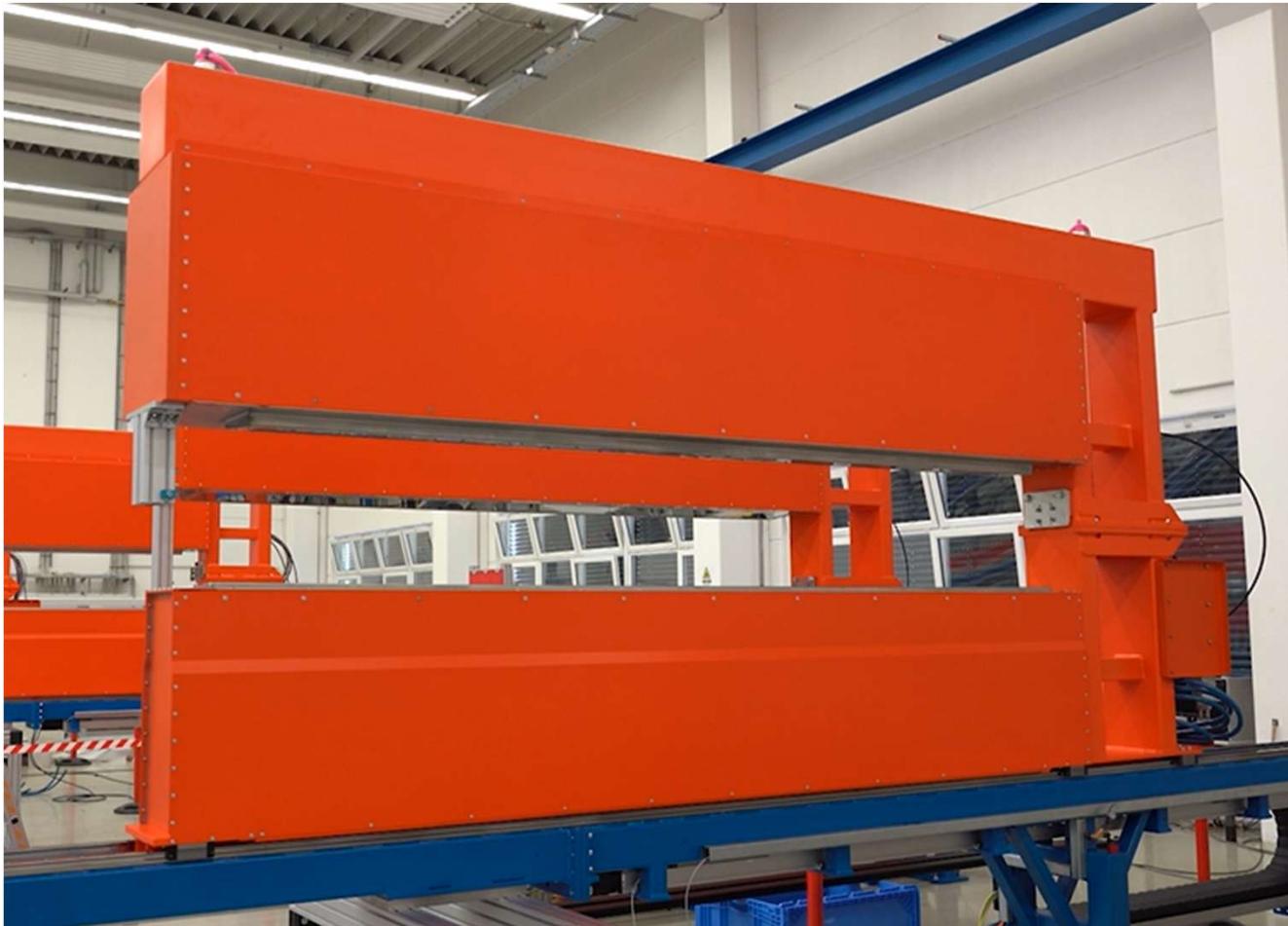
Installation / Copper Tinning Line



Installation / Copper Tinning Line



Installation / Dr Schenk Custom Built C-Frame



Top And Bottom Inspection In A Traversable C-Frame

Installation / Dr Schenk Standard Frame



Application: Copper Annealing Line

Two Cameras Per Side:

Two to Four Inspection Channels Per Side

Strip Width = 62" / 1575mm

Strip Speed = 500 FPM / 93 MPM

System Resolution:

Cross Strip = 90 um / .004"

Down Strip = 72um / .003"

Visualization Software



Job: G100016323
Recipe: No Apply-None-Medium-Medium

G100016312-015

Material Length: 1330.68 m
Material Width: 1090.25 mm

Speed: 108.772 m/min

2021-04-16 11:36:17

Inspection On

Status Ok

Running Defect Map Graphs & Maps Statistics Defect Library User

Freeze Follow Clear Mark Top
Commissioning

Drive Side
Operator Side

Filter
Images
Details
Defect List
Ranges
Qualities

Cross Direction Material [mm]
0 200 400 600 800 1,000

Machine Direction Material [m]
900 1,000 1,100 1,200 1,300

Class: LP Bright + Dark
width: 17.389137 mm
length: 91.892812 mm

10 mm RFD

Class: LP Bright + Dark
width: 8.211537 mm
length: 89.541562 mm

10 mm RFD

Class: LP Bright + Dark
width: 12.679579 mm
length: 91.732500 mm

10 mm RFD

Class: LP Bright + Dark
width: 6.037895 mm
length: 75.763125 mm

10 mm RFD

Class: LP Bright + Dark
width: 32.604632 mm
length: 99.689062 mm

10 mm RFD

Class: LP Bright + Dark
width: 7.849263 mm
length: 63.205313 mm

10 mm RFD

Class: LP Bright + Dark
width: 2.294400 mm
length: 2.064375 mm

10 mm RFD

Class: LP Bright + Dark
width: 11.713516 mm
length: 27.950625 mm

10 mm RFD

Class: LP Bright + Dark
width: 21.101103 mm
length: 13.938750 mm

10 mm RFD

⏪ ⏩ ⏴ ⏵

Freeze Follow Clear Mark Bottom
Commissioning

Drive Side
Operator Side

Filter
Images
Details
Defect List
Ranges
Qualities

Cross Direction Material [mm]
0 200 400 600 800 1,000

Machine Direction Material [m]
900 1,000 1,100 1,200 1,300

Class: LP Dark
width: 2.206799 mm
length: 1.603125 mm

10 mm RRD

Class: LP Dark
width: 1.346277 mm
length: 2.550937 mm

10 mm RRD

Class: LP Dark
width: 1.591054 mm
length: 2.160000 mm

10 mm RRD

Class: LP Bright + Dark
width: 19.459816 mm
length: 24.634687 mm

10 mm RRD

Class: LP Dark
width: 10.035880 mm
length: 10.811250 mm

10 mm RRD

Class: LP Bright + Dark
width: 13.240797 mm
length: 15.395625 mm

10 mm RRD

Class: Bright
width: 16.305796 mm
length: 18.213750 mm

10 mm RRD

Class: LP Dark
width: 1.346277 mm
length: 3.060000 mm

10 mm RRD

Class: Bright
width: 17.030970 mm
length: 28.766250 mm

10 mm RRD

⏪ ⏩ ⏴ ⏵

Current Production

Jobs

Products

Tools

Setup

Production History

Status

Help

Automatic Reports

Activate Next Job

Waste Mode

Trash Mode

Inspection

New Job...

Print Screen

Dents Top Side -



dr. schenk EasyInspect U14190008
Job: G100019502
Material Length: 1361.84 m
Speed: 113.688 m/min
Service: 2021-05-27 08:10:21
Inspection On
Status Ok

Running Defect Map Graphs & Maps Statistics Defect Library User

Top Live Commissioning

Drive Side Operator Side

Cross Direction Material [mm]

Class: Pintura Carente width: 16.664590 mm length: 17.730000 mm	Class: Grano de Zinc Sin width: 10.626695 mm length: 15.345000 mm	Class: Grano de Zinc Sin width: 43.231327 mm length: 51.204375 mm
Class: Grano de Zinc Sin width: 40.634696 mm length: 45.911250 mm	Class: Grano de Zinc Sin width: 17.026864 mm length: 23.416875 mm	Class: Pintura Carente width: 25.721432 mm length: 32.220000 mm
Class: Grano de Zinc Sin width: 25.683057 mm length: 29.323125 mm	Class: Grano de Zinc Sin width: 48.833981 mm length: 57.318750 mm	Class: Grano de Zinc Sin width: 38.826030 mm length: 54.798750 mm

Bottom Live Commissioning

Drive Side Operator Side

Cross Direction Material [mm]

Class: Pintura Carente width: 25.946422 mm length: 26.308125 mm	Class: Grano de Zinc Sin width: 9.930597 mm length: 11.458125 mm	Class: Pintura Carente width: 7.465716 mm length: 10.423125 mm
Class: Pintura Carente width: 20.841995 mm length: 24.294375 mm	Class: Pintura Carente width: 24.355367 mm length: 24.131250 mm	Class: Chorreadura Zinc width: 7.853796 mm length: 13.044375 mm
Class: No Especificado width: 8.091598 mm length: 13.010625 mm	Class: Pintura Carente width: 2.942399 mm length: 7.396875 mm	Class: Pintura Carente width: 5.140329 mm length: 6.924375 mm

Login

Automatic Reports

Activate Next Job

Waste Mode

Inspection

New Job...

Print Screen

Installation On A Slitter (After The Knives)



Defect Map - 28439-46763, 28439-46763, 28439-46763 (Database)

Mosaic View - 28439-46763, 28439-46763, 28439-46763 (Database)

Machine Direction [ft]

Cross Direction Material [in]

Operator

Symbol Color: Defect Class, Symbol Size Mode: Fixed

Name	Mother Roll	Comment	Rolls	Start Date	Stop Date	Length [ft]
28439-46763	28439-46763		Good	2019-01-07 10:23:42	2019-01-07 11:12:36	672.8
28439-46763	28439-46763		Good	2019-01-07 10:23:42	2019-01-07 11:12:36	672.8
28439-46763	28439-46763		Good	2019-01-07 10:23:42	2019-01-07 11:12:36	672.8

Total: 1197 Selected: 1 Visible: 980

FIGURE 1. ROLL MARKS SO SUBTLE THEY CAN ONLY BE VERIFIED BY THE KNIFE EDGE CHANNEL

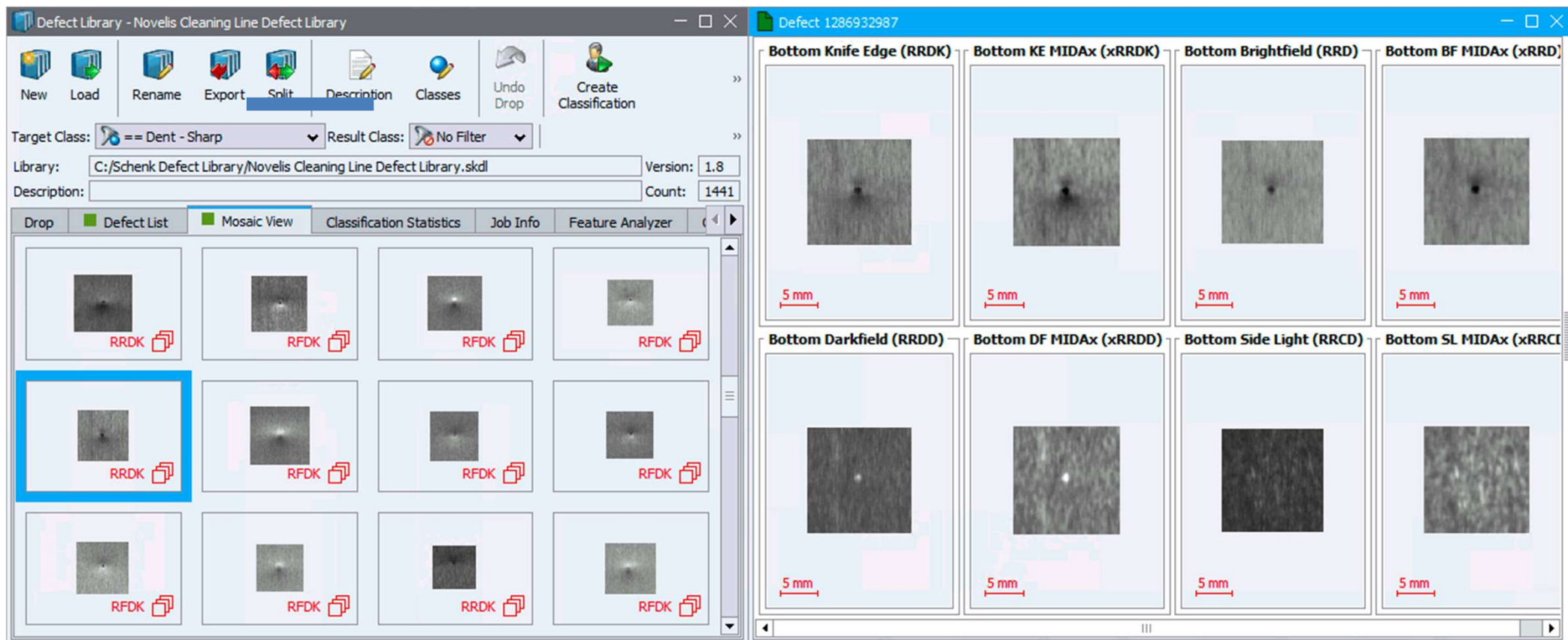


FIGURE 1. ROLL MARKS VERIFIED BY THE KNIFE EDGE CHANNEL

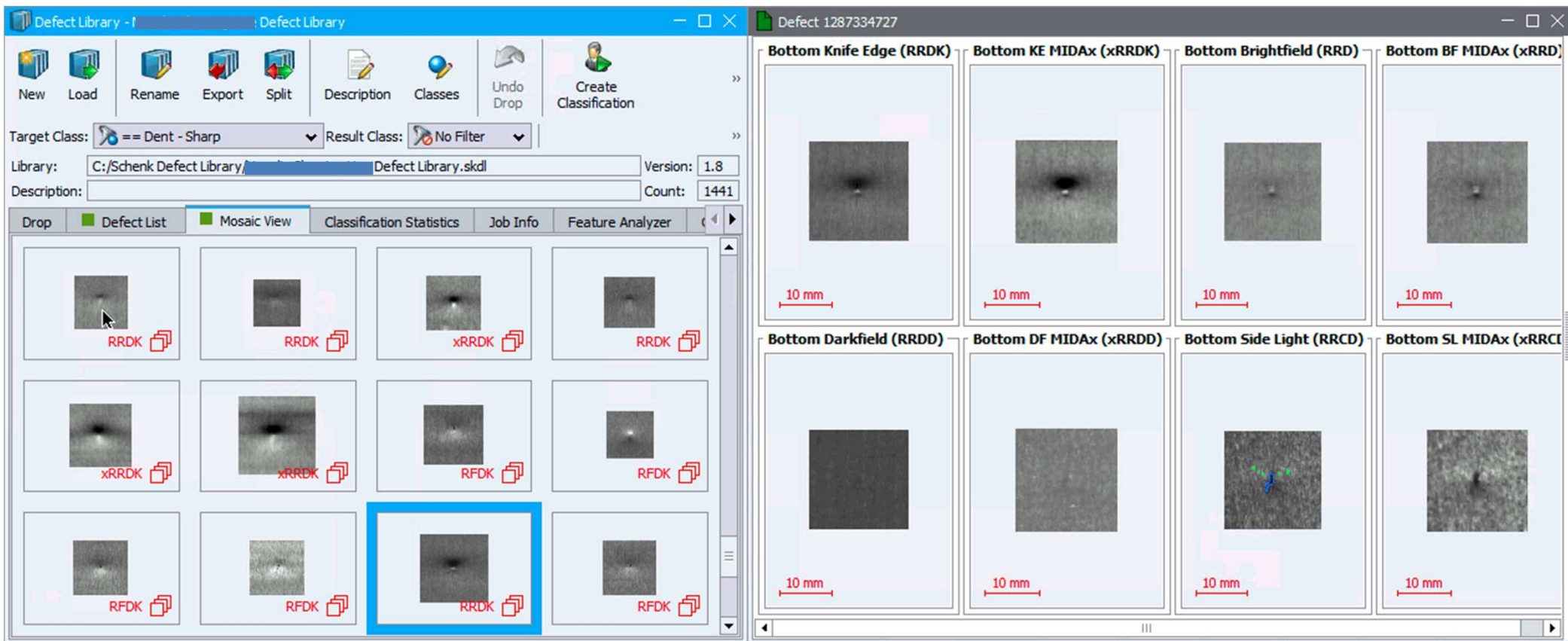
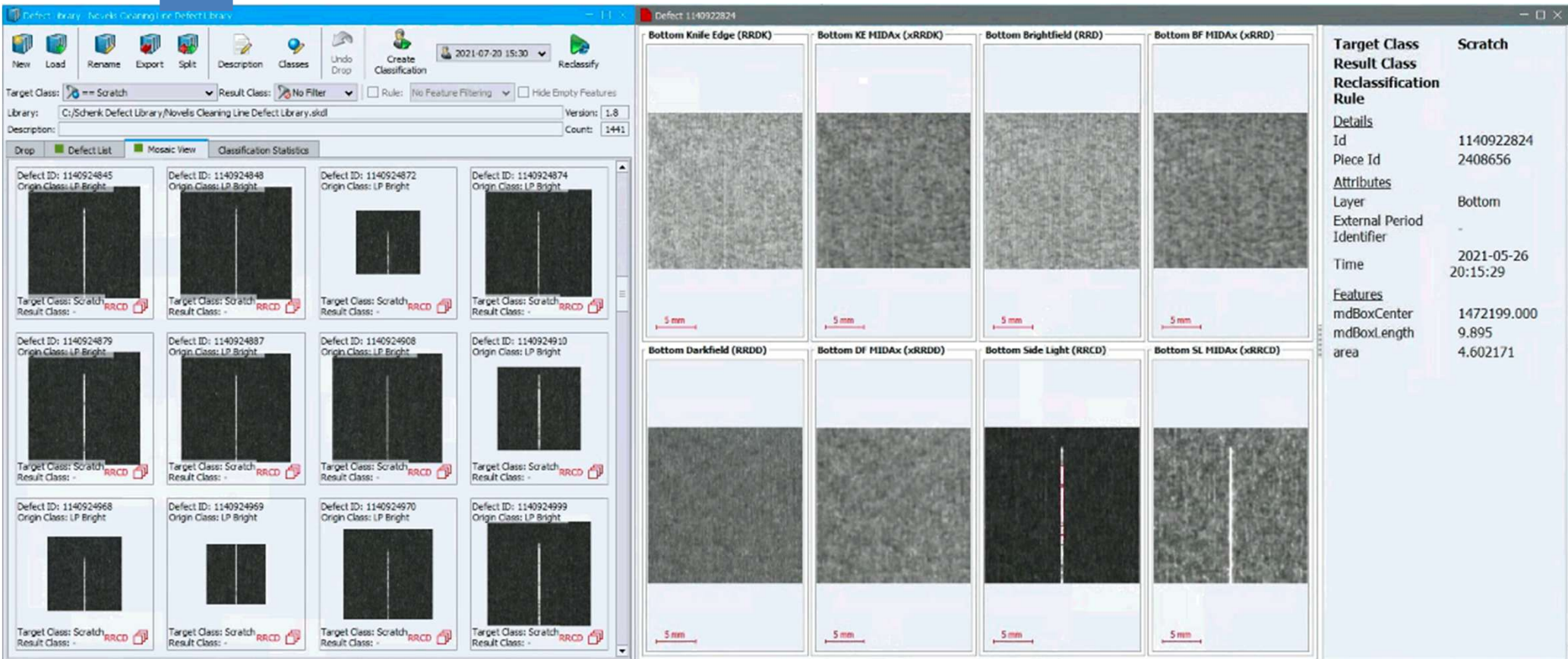


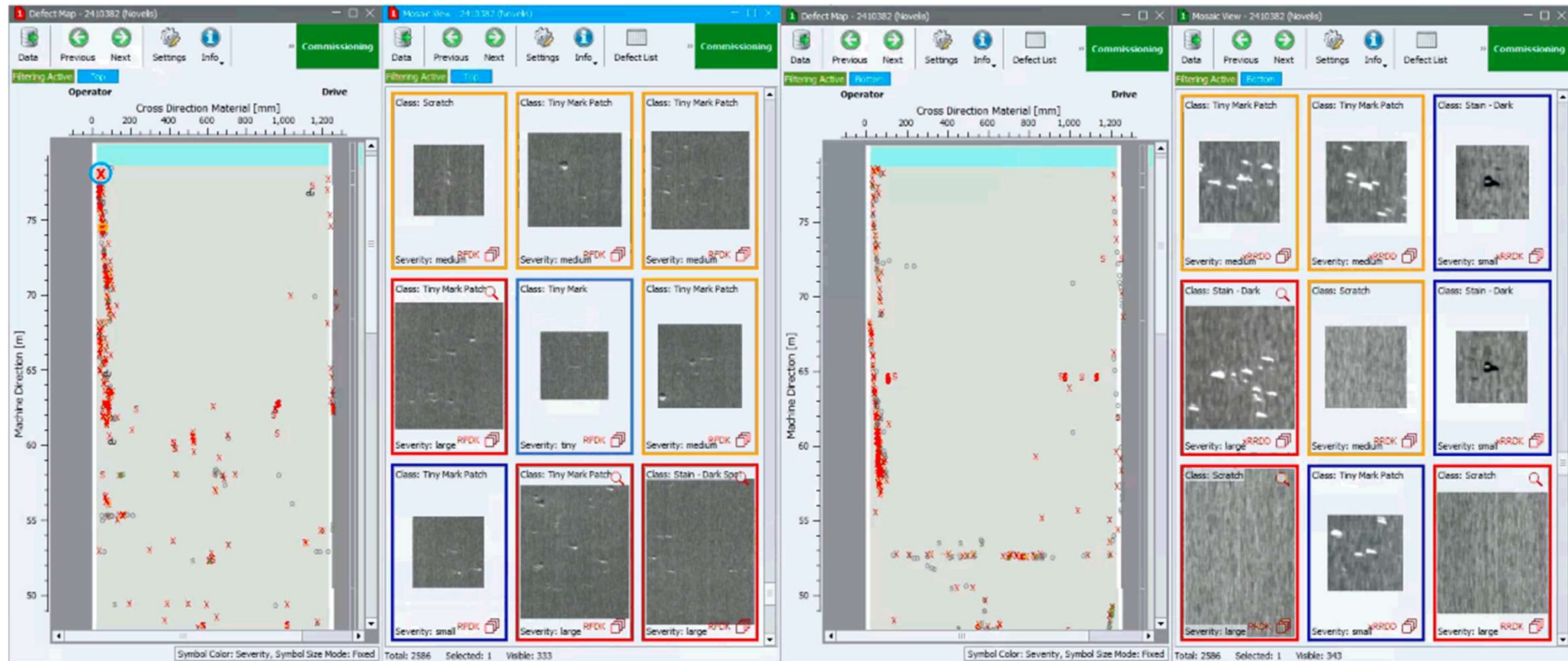
FIGURE 3. SCRATCHES SO NARROW AND SUBTLE THEY ARE ONLY RELIABLY DETECTED AND CLASSIFIED IN THE SIDE LIGHTING CHANNEL



The screenshot displays the Defect Library software interface. On the left, a grid of defect images is shown, each with a unique ID and classification. The main area features a detailed view of a specific defect (ID: 1140922824) across eight different lighting channels: Bottom Knife Edge (RRDK), Bottom KE MIDAx (xRRDK), Bottom Brightfield (RRD), Bottom BF MIDAx (xRRD), Bottom Darkfield (RRDD), Bottom DF MIDAx (xRRDD), Bottom Side Light (RRCD), and Bottom SL MIDAx (xRRCD). Each channel includes a 5 mm scale bar. On the right, a detailed information panel for the selected defect is visible.

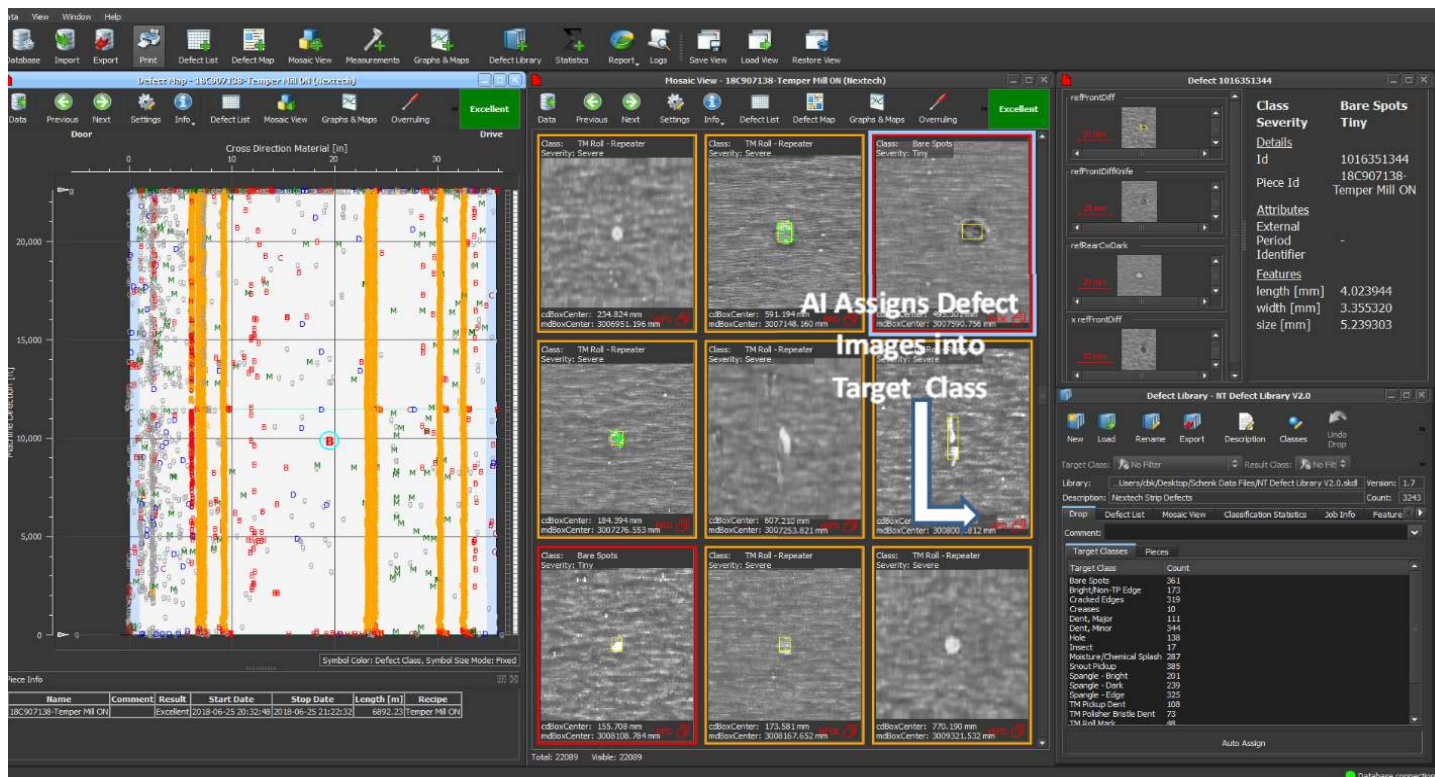
Target Class	Scratch
Result Class	Scratch
Reclassification Rule	
Details	
Id	1140922824
Piece Id	2408656
Attributes	
Layer	Bottom
External Period Identifier	-
Time	2021-05-26 20:15:29
Features	
mdBoxCenter	1472199.000
mdBoxLength	9.895
area	4.602171

FIGURE 4. TYPICAL OPERATORS SCREEN SHOWING SYSTEM PERFORMANCE AND FUNCTIONALITY



AI Classifier Assistant / Smarter Defect Libraries

As defect images are collected, the AI assistant automatically suggests into which class unspecified defects should be categorized, based on what the system learned from previous examples:



The screenshot displays the Hestech software interface for defect analysis. The main window shows a 'Defect Map' with a grid of colored markers representing defects. Below the map is a 'Process Info' table:

Name	Comment	Result	Start Date	Stop Date	Length [m]	Recipe
18C907138-Temper Mill ON		Excellent	2018-06-25 20:32:46	2018-06-25 21:22:32	6692.231	Temper Mill ON

The 'Mosaic View' shows a grid of defect images. A text overlay 'AI Assigns Defect Images into Target Class' with a blue arrow points to a defect image in the top-right cell of the mosaic. The 'Defect Details' panel on the right shows the following information for Defect 1016351344:

- Class:** Bare Spots
- Severity:** Tiny
- Id:** 1016351344
- Piece Id:** 18C907138-Temper Mill ON
- Attributes:** External Period Identifier
- Features:** length [mm] 4.023944, width [mm] 3.355320, size [mm] 5.239303

The 'Defect Library' panel at the bottom right shows a list of target classes and their counts:

Target Class	Pieces	Count
Bare Spots		361
Bright/Non-IP Edge		173
Cracked Edges		739
Creases		40
Dent, Major		111
Dent, Minor		244
Hole		138
Insect		17
Moisture/Chemical Splash		287
Shout/Pickup		365
Scrape - Bright		201
Scrape - Dark		239
Scrape - Edge		325
TM Pickup Dent		108
TM Polisher Brags Dent		78
TM Tool Lines		46

Advanced Hardware **AND** Artificial Intelligence

Classification Accuracy Test



The first figure below is a test of all of the defects in the library across all defect classes (Over 11,000 defects). The 100% score tells us the library is as accurate as it can be.

Target Class																	100.0 %	
																	100.0 %	
Result Class	37	38	39	40	41	42	43	44	45	46	47	48	49	Σ	Purity [%] Average: 100.0	Σ	Purity Groups [%] Average: 100.0	
30 Manchas Sin galvanizar pintadas															501	100.0	501	100.0
31 Mapas de agua															15	100.0	15	100.0
32 Marca de ajuste															28	100.0	28	100.0
33 Orilla ondulada															3	100.0	3	100.0
34 Orilla serrucho															13	100.0	13	100.0
35 Perforacion															37	100.0	37	100.0
36 Piedra de zinc															84	100.0	84	100.0
37 Pintura Acordonada	84														101	100.0	101	100.0
38 Pintura abierta		101													850	100.0	850	100.0
39 Plasta de Pintura			850												124	100.0	124	100.0
40 Plasta de Zinc				124											353	99.4	353	99.4
41 Puntos Sin Pintar - Brillosos					353										54	100.0	54	100.0
42 Puntos Sin Pintar - Oscuros						54									61	100.0	61	100.0
43 Raya de Pintura							61								1137	100.0	1137	100.0
44 Salpicadura de pintura								1137							106	100.0	106	100.0
45 Tableado									106						626	99.8	627	99.8
46 Tachon										626	1				153	100.0	153	100.0
47 Tachon sin pintar												153			135	100.0	135	100.0
48 Tallon													135		130	100.0	130	100.0
49 Tallon 1													130					
Σ Total	84	101	850	125	353	54	61	1137	106	626	154	135	130	11080	-	-	-	-
Accuracy [%] Average: 99.8	100.0	100.0	100.0	99.2	100.0	100.0	100.0	100.0	100.0	100.0	99.4	100.0	100.0	-	Classification Rate: 100.0 %	-	-	-
Σ Total Groups	84	101	850	125	353	54	61	1137	106	626	154	135	130	-	-	-	-	-
Accuracy Groups [%] Average: 99.8	100.0	100.0	100.0	99.2	100.0	100.0	100.0	100.0	100.0	100.0	99.4	100.0	100.0	-	-	-	Group Rate: 100.0 %	-
Unspecified					1									2	-	-	-	-



How Can We Make The Data More Valuable??

- Automatic Coil Grading...That You Can Be Confident In!

Select Data

Severity Filter Defect Flags Filter Feature And Attribute Filter

Database: Trans-Mit Eldest Entry: 2021-10-01 10:37:34
Newest Entry: 2022-09-27 15:13:48

Rolls:

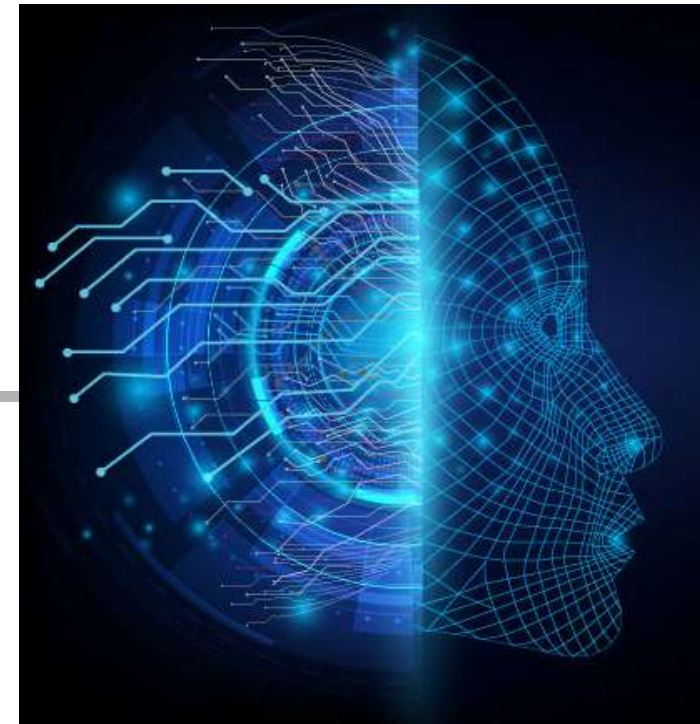
Time Period Qualities Until: 2022-09-27 15:25:47 Now Period: 8 Hours Number of Pieces: 48

Result	Name	Start	End	Length [m]	Width [mm]	Defects	Recipe	Comment
Fail	TM026105 A	2022-09-27 15:13:46	2022-09-27 15:13:46	2528.5	989	2243		
Pass	TM026105-01	2022-09-27 15:13:46	2022-09-27 15:13:46	2528.5	453	910	3 Coil - Posco	
Fail	TM026105-02	2022-09-27 15:13:46	2022-09-27 15:13:46	2528.5	854	1175	3 Coil - Posco	
Pass	TM026105-03	2022-09-27 14:43:29	2022-09-27 15:13:46	2528.5	940	158	3 Coil - Posco	
Pass	TM026104 B	2022-09-27 14:05:30	2022-09-27 14:05:30	2528.5	450	1299		
Pass	TM026104-01	2022-09-27 14:05:30	2022-09-27 14:05:30	2528.5	450	673	3 Coil - Posco	
Pass	TM026104-02	2022-09-27 14:05:30	2022-09-27 14:05:30	2528.5	450	504	3 Coil - Posco	
Pass	TM026104-03	2022-09-27 14:05:30	2022-09-27 14:05:30	2528.5	450	122	3 Coil - Posco	
Pass	TM026104 A	2022-09-27 13:24:09	2022-09-27 13:24:09	2753.9	454	1798		
Pass	TM026104-01	2022-09-27 13:24:09	2022-09-27 14:05:30	2753.9	454	1230	3 Coil - Posco	
Pass	TM026104-02	2022-09-27 13:24:09	2022-09-27 14:05:30	2753.9	442	467	3 Coil - Posco	
Pass	TM026104-03	2022-09-27 13:24:09	2022-09-27 14:05:30	2753.9	79	101	3 Coil - Posco	
Pass	TM026106 C	2022-09-27 12:33:49	2022-09-27 13:24:09	60.2	1182	1911		
Pass	TM026106-01	2022-09-27 12:33:49	2022-09-27 13:24:09	60.2	1110	952	3 Coil - Posco	
Pass	TM026106-02	2022-09-27 12:33:49	2022-09-27 13:24:09	60.2	978	696	3 Coil - Posco	
Pass	TM026106-03	2022-09-27 12:33:49	2022-09-27 13:24:09	60.2	1010	263	3 Coil - Posco	
Review	TM026106 B	2022-09-27 12:14:16	2022-09-27 12:33:49	24.5	1150	791		
Pass	TM026106-01	2022-09-27 12:14:16	2022-09-27 12:33:49	24.5	885	292	3 Coil - Posco	
Review	TM026106-02	2022-09-27 12:14:16	2022-09-27 12:33:49	24.5	978	430	3 Coil - Posco	
Pass	TM026106-03	2022-09-27 12:14:16	2022-09-27 12:33:49	24.5	1013	69	3 Coil - Posco	
Pass	TM026106 B (*)	2022-09-27 12:08:57	2022-09-27 12:14:16	3.3	987	0		
Pass	TM026106-01 (*)	2022-09-27 12:08:57	2022-09-27 12:14:16	3.3	639	0	3 Coil - Posco	
Pass	TM026106-02 (*)	2022-09-27 12:08:57	2022-09-27 12:14:16	3.3	398	0	3 Coil - Posco	
Pass	TM026106-03 (*)	2022-09-27 12:08:57	2022-09-27 12:14:16	3.3	530	0	3 Coil - Posco	
Fail	TM026106 B	2022-09-27 12:06:25	2022-09-27 12:08:57	189.2	1140	1677		
Pass	TM026106-01	2022-09-27 12:06:25	2022-09-27 12:08:57	189.2	601	186	3 Coil - Posco	
Fail	TM026106-02	2022-09-27 12:06:25	2022-09-27 12:08:57	189.2	908	1431	3 Coil - Posco	
Pass	TM026106-03	2022-09-27 12:06:25	2022-09-27 12:08:57	189.2	518	60	3 Coil - Posco	
Pass	TM026106 A (*)	2022-09-27 12:03:58	2022-09-27 12:06:25	4.7	984	0		
Pass	TM026106-01 (*)	2022-09-27 12:03:58	2022-09-27 12:06:25	4.7	636	0	3 Coil - Posco	
Pass	TM026106-02 (*)	2022-09-27 12:03:58	2022-09-27 12:06:25	4.7	441	0	3 Coil - Posco	
Pass	TM026106-03 (*)	2022-09-27 12:03:58	2022-09-27 12:06:25	4.7	339	0	3 Coil - Posco	
Pass	TM026099 A	2022-09-27 10:57:25	2022-09-27 12:03:58	2393.3	990	1588		
Pass	TM026099-01	2022-09-27 10:57:25	2022-09-27 12:03:58	2393.3	788	363	3 Coil - Posco	
Pass	TM026099-02	2022-09-27 10:57:25	2022-09-27 12:03:58	2393.3	442	1059	3 Coil - Posco	
Pass	TM026099-03	2022-09-27 10:57:25	2022-09-27 12:03:58	2393.3	339	166	3 Coil - Posco	
Review	TM026099 A	2022-09-27 10:27:54	2022-09-27 10:57:25	2597.2	990	3110		
Pass	TM026099-01	2022-09-27 10:27:54	2022-09-27 10:57:25	2597.2	453	767	3 Coil - Posco	
Pass	TM026099-02	2022-09-27 10:27:54	2022-09-27 10:57:25	2597.2	442	2010	3 Coil - Posco	
Review	TM026099-03	2022-09-27 10:27:54	2022-09-27 10:57:25	2597.2	78	333	3 Coil - Posco	

Selected Pieces: 0/64

Find:

DEFECTS HAVE NO PLACE TO HIDE



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