

Welcome



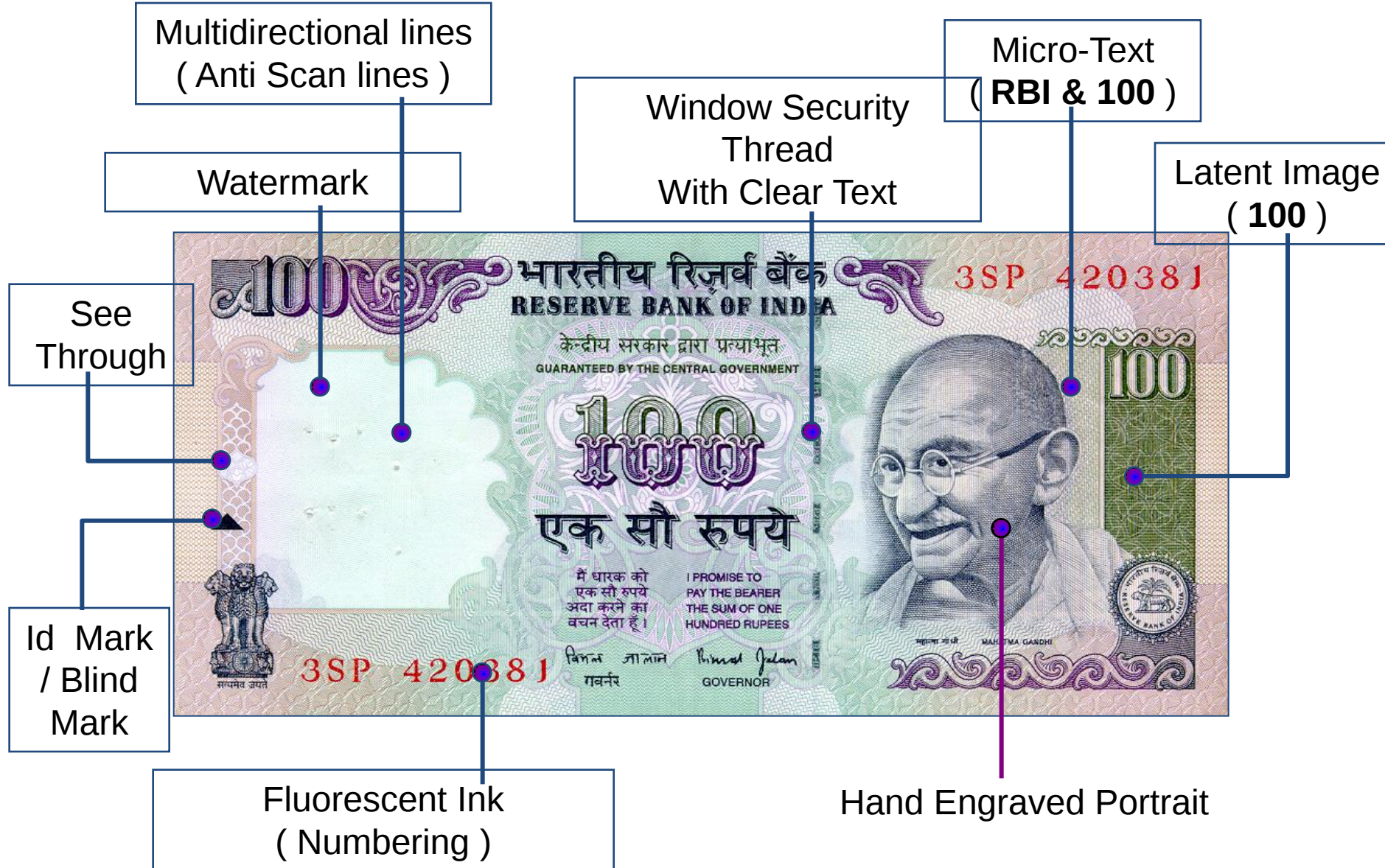
B. V. S. SIVA PRASAD
Assistant Director
AP Forensic Science Laboratory,
Mangalagiri

Forensic Physics

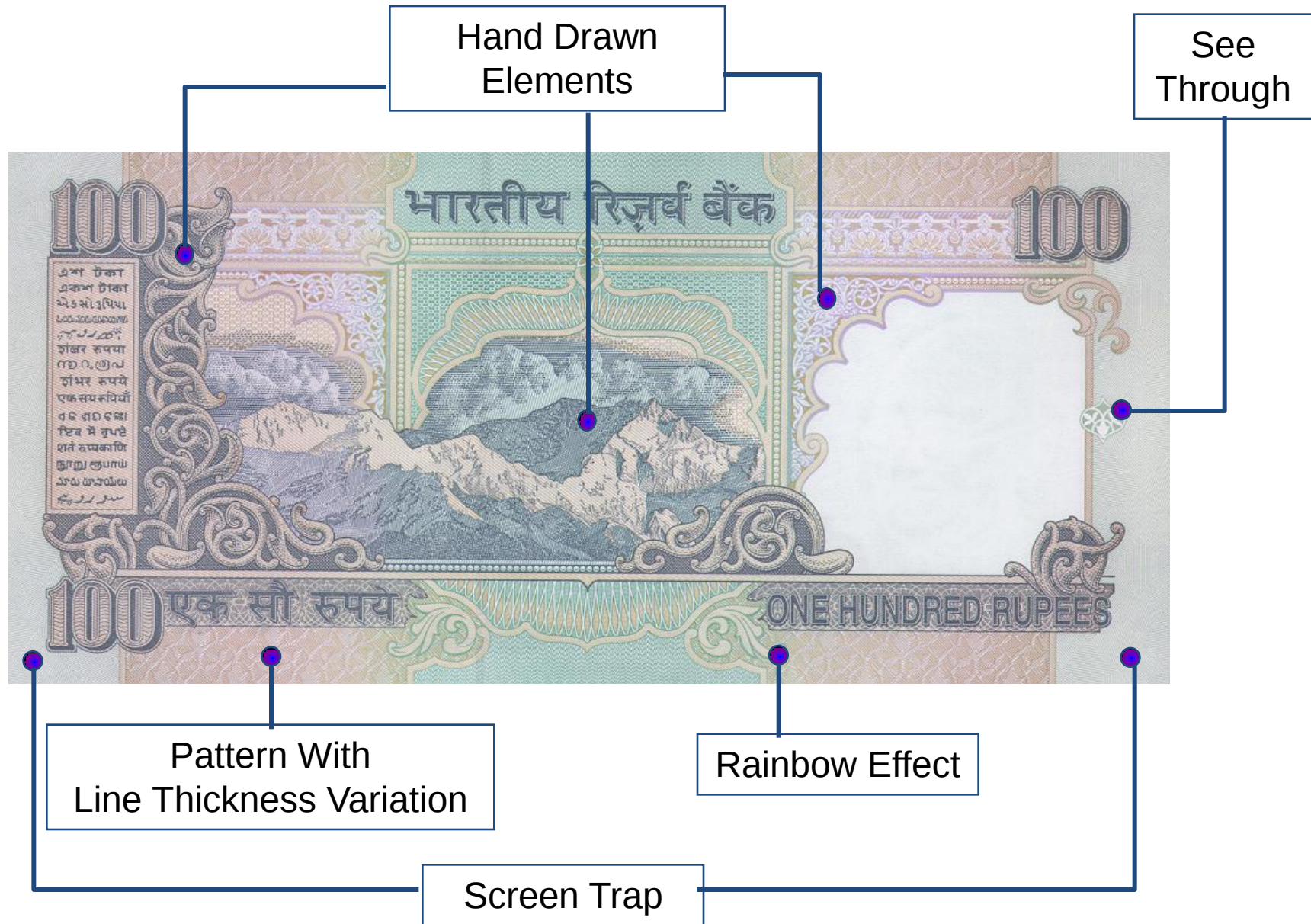
- Counterfeit currency notes and fake security documents
- Glass
- Paint
- Soil
- Spurious Articles (Automobile spares, engine oil bottles, printer cartridges, watches, branded apparel etc.)
- Tool marks
- Track marks – Footprints/footwear prints & tyre marks
- Restoration of erased numbers on Vehicles and fire arms
- Spurious metals (Gold, Platinum)
- Precious stones (Diamonds etc.,)
- Electrical wires/Fuses (short circuit cases)



100 RUPEES Note : Front



100 RUPEES Note : Back



Water Mark

Genuine



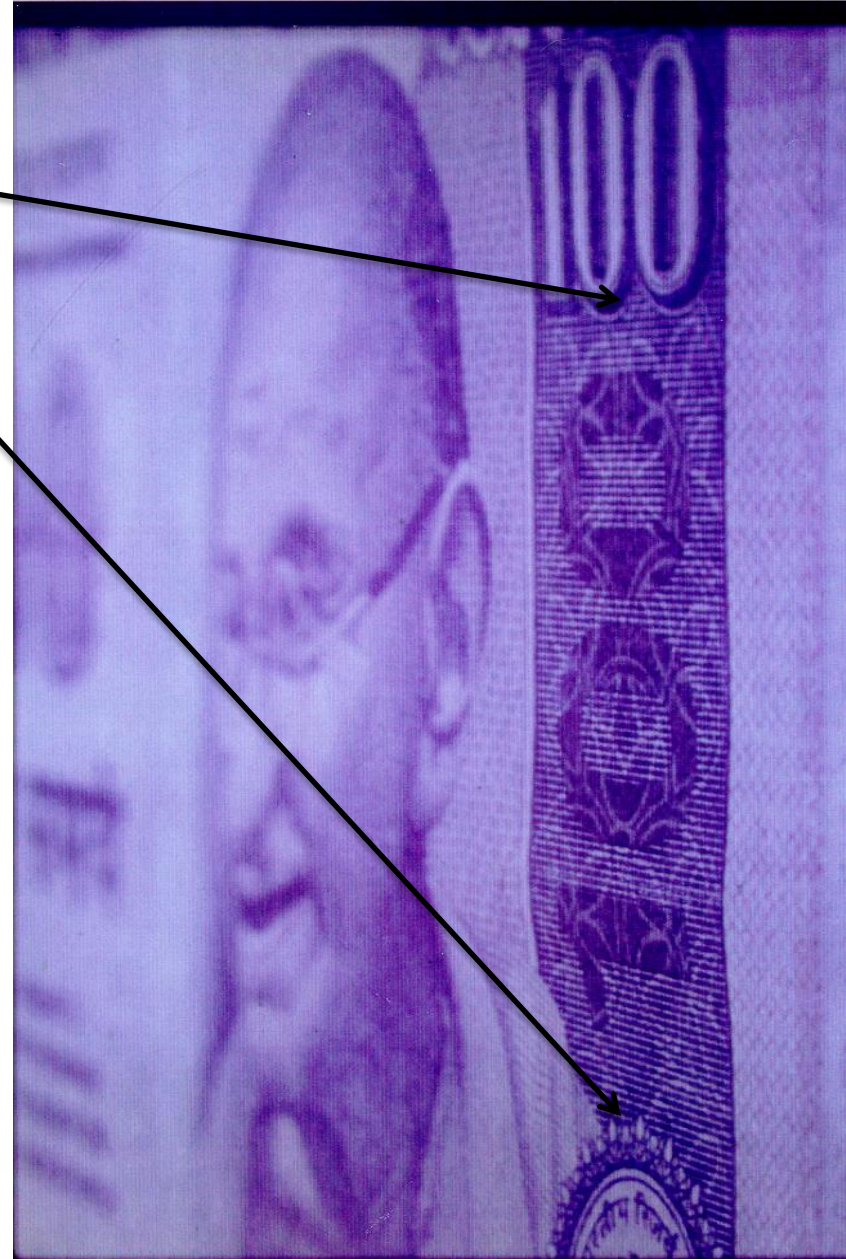
Fake



Micro-Lettering



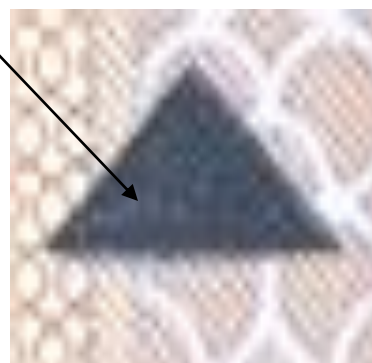
LATENT IMAGE



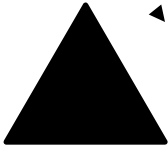
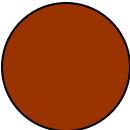
- Denomination “100” which is hidden in the vertical band is the **latent image** .
- The **latent image** “100” cannot be replicated by photocopiers .

Identification Mark

- Rs.20 and above
- Introduced in the note to help the visually impaired to identify the denomination
- Appears on the left of the watermark window
- This mark is in intaglio printing and it is in different geometrical shapes for various denomination
- To make the intaglio effect more prominent, the **engraving depth has been increased from 83 microns to 160 microns.**



Identification mark

Rs.100			TRIANGLE
Rs.200			Alphabet 'H'
Rs.500			CIRCLE
Rs.2000			RECTANGLE

Intaglio Printing



Genuine

Fake

12:38 07/04/2005 Lights=Flood 100%, Longpass=VIS, Bandpass=OFF, Mag=6.28
Auto Exposure (Integration=1/60, Iris=50%, Gain=0dB), Brightness=Auto, Contrast=Auto, Imaged width =58.60 mm

Denomination Design see-through

Front side



Back side



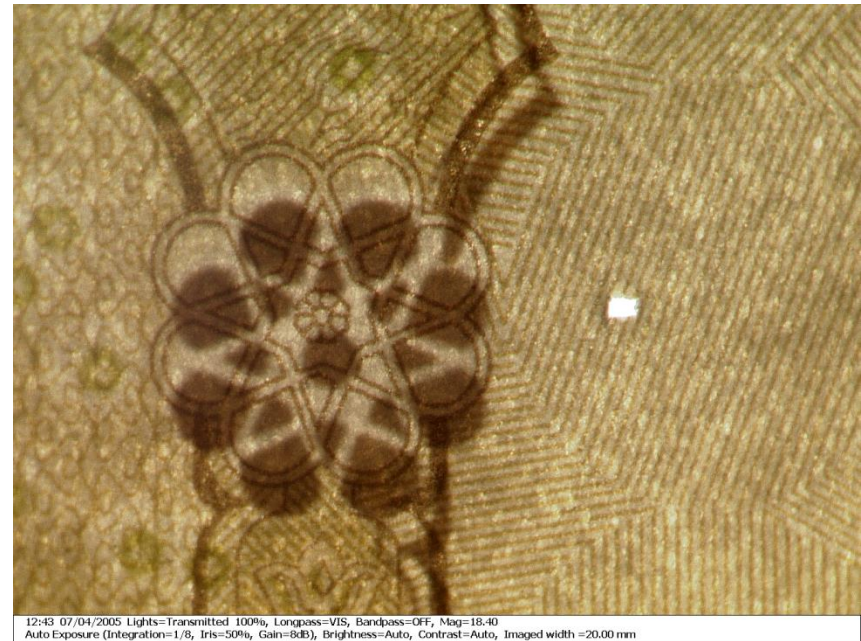
See-through

See Through Register

Genuine

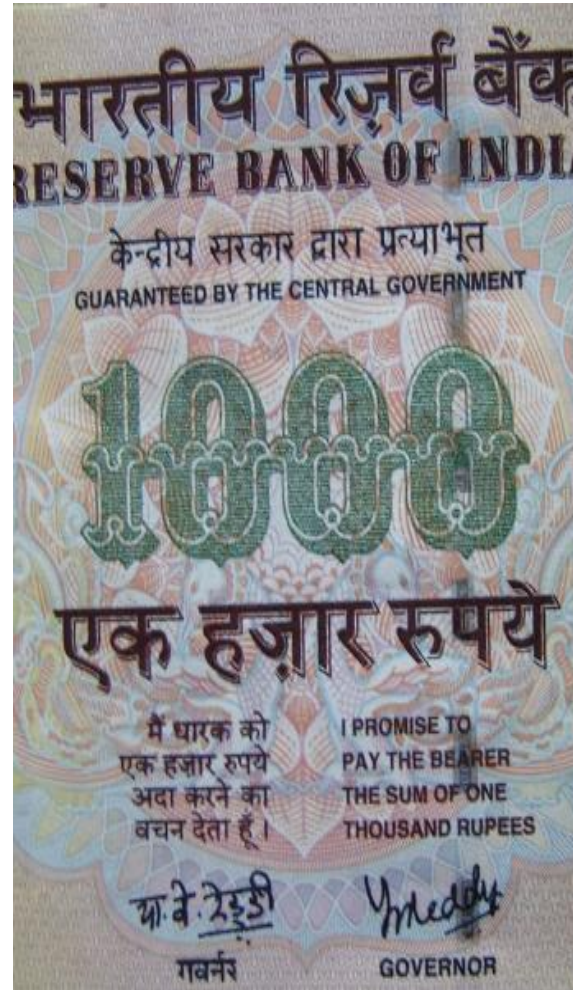


Fake



Optically Variable Ink (OVI) Effect

OV Ink is used to print the denomination at the centre of the face side of the note. When the note is viewed directly, the colour of denomination will be green and when it is tilted to an angle, it turns to blue.



भारतीय रिज़र्व बैंक
केन्द्रीय सरकार द्वारा प्रत्याभूत

दो हजार रुपये

0AA 000000

₹ 2000

SPECIMEN



MAYADRAM

0005

महामा आधी

MAHATMA GANDHI

SPECIMEN 006

RESERVE BANK OF INDIA

GUARANTEED BY THE CENTRAL GOVERNMENT

मैं भारत को
दो हजार रुपये
अदा करने का
घबने देता हूँ।
प्रति दो हजार रुपये
प्रति धारक को
नवंबर
प्रति दो हजार रुपये
प्रति धारक को
नवंबर

PROMISE TO
PAY THE BEARER
THE SUM OF TWO
THOUSAND RUPEES

GOVERNOR



2000

₹ 2000

गोष्ट किं तल्लुळ प्रकळ करु

0AA 000000

8105

रिजर्व बैंक
दो हजार रुपये



सत्यमेव जयते

भारतीय रिज़र्व बैंक पाँच सौ रुपये

केन्द्रीय सरकार द्वारा प्रत्याभूत

000 000000

500

500

₹ 500

₹ 500



महात्मा गांधी

MAHATMA GANDHI

MAHATMA GANDHI

0023

SPECIMEN 0213

RESERVE BANK OF INDIA

GUARANTEED BY THE CENTRAL GOVERNMENT

पाँच सौ रुपये
भारतीय रिज़र्व बैंक
केन्द्रीय सरकार द्वारा प्रत्याभूत
पाँच सौ रुपये
THE SUM OF FIVE
HUNDRED RUPEES
GOVERNOR



500

₹ 500

गोष्ठ कि तलखत मरक तप

0000000000

8105

रिज़र्व बैंक

भारतीय रिज़र्व बैंक
केन्द्रीय सरकार द्वारा प्रचलित

दो हजार रुपये

RESERVE BANK OF INDIA
GUARANTEED BY THE CENTRAL GOVERNMENT

0AA 000000

₹2000



महात्मा गांधी MAHATMA GANDHI

SPECIMEN

मैं धारक को
दो हजार रुपये
अदा करने का
बचन देता हूँ।
उत्तिष्ठ आर पश्यत
तवर्त

I PROMISE TO
PAY THE BEARER
THE SUM OF TWO
THOUSAND RUPEES


GOVERNOR



₹2000

0AA 000000

SPECIMEN 0061

INDIA RB 2000



Counterfeiting

- A person is said to ‘counterfeit’ who causes one thing to resemble another thing, intending by means of the resemblance to practice deception or knowing it to be likely that deception thereby will be practiced”
- Counterfeiting offence under Sec.489A to 489E of IPC
- any forensic laboratory, Bank note press, any security printing press (Devas/ Nasik) are authorized to examine the counterfeit currency notes.

EXAMINATION OF GLASS

- Broken glass pieces / particles / fragments is a source of evidence in cases like burglary, vehicle theft, hit & run cases, automobile accidents
- When a window pane was broken by a projectile most of the fragments fly in the direction of blow but some tiny particles fly backwards and may be embedded in clothes of accused

EXAMINATION OF GLASS

Available forms:

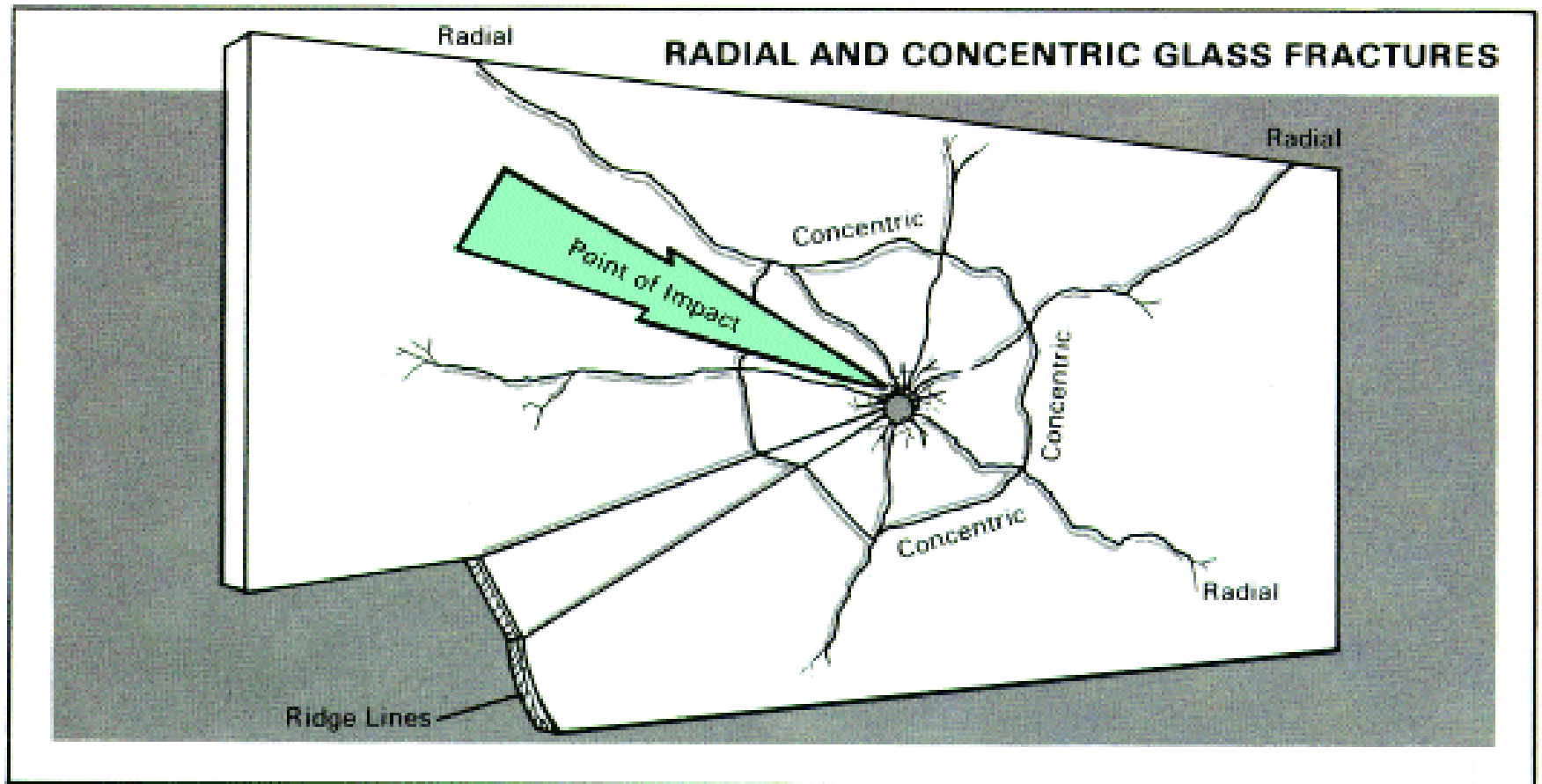
- Glass pieces, fragments, sheets of glass containing broken pattern etc.,
- Glass fractures
 - Radial fractures
 - Concentric fractures
 - Rib marks
 - Cone fracture
 - Sequence of bullets
 - Backward fragmentation

HOW IS GLASS INVOLVED IN CRIME?

- Small fragments can be used as **trace evidence** (link objects/people)
- Crime scene reconstruction



GLASS FRACTURES



GLASS FRACTURES



PHYSICAL MATCHING

Broken indicator dome pieces



EXAMINATION OF GLASS

■ METHODS OF EXAMINATION:

- Physical matching
- Microscopic examination
- Colour
- Ultra violet fluorescence
- Density
- Refractive Index
- Elemental composition (By instrumental methods)

EXAMINATION OF GLASS

- Certain metal oxides are used for specific characteristics of glass
Borex & aluminium oxide --- Heat resistant glass
Lead oxide ----- For absorption of radiation
- Impurities in raw materials act as trace elements and provide specific identifiable characteristics in glass.

EXAMINATION OF PAINT

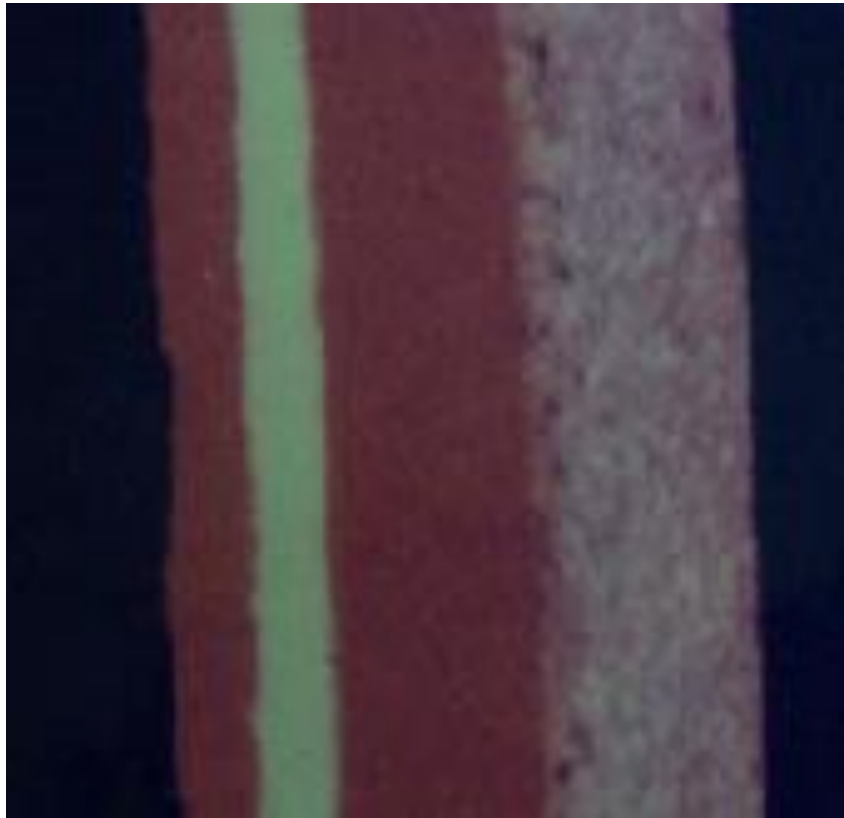
■ Available forms:

Chips, flakes, smears etc.,

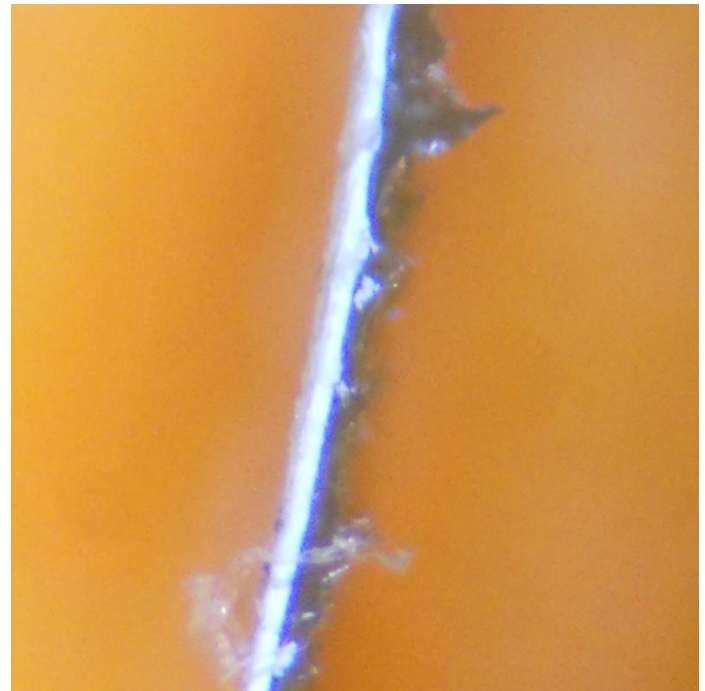
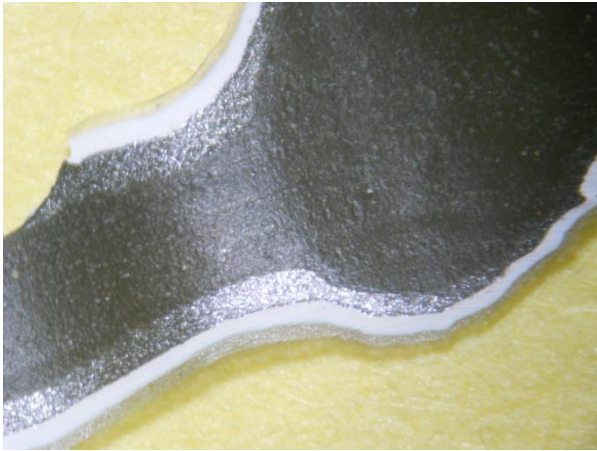
■ METHODS OF EXAMINATION:

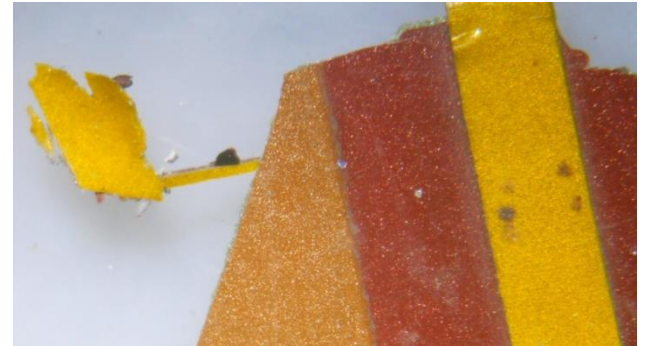
- Macroscopic examination
- Microscopic examination
- Ultra violet fluorescence
- Density Gradient analysis
- Instrumental analysis

CROSS SECTION OF A PAINT CHIP



Layers of a paint chip





EXAMINATION OF SOIL

■ Definition

Soil is a complex mixture. It contains mineral particles, plant materials, living organisms, decayed and other organic matter (humus), man-made particles etc.,

- Available forms:

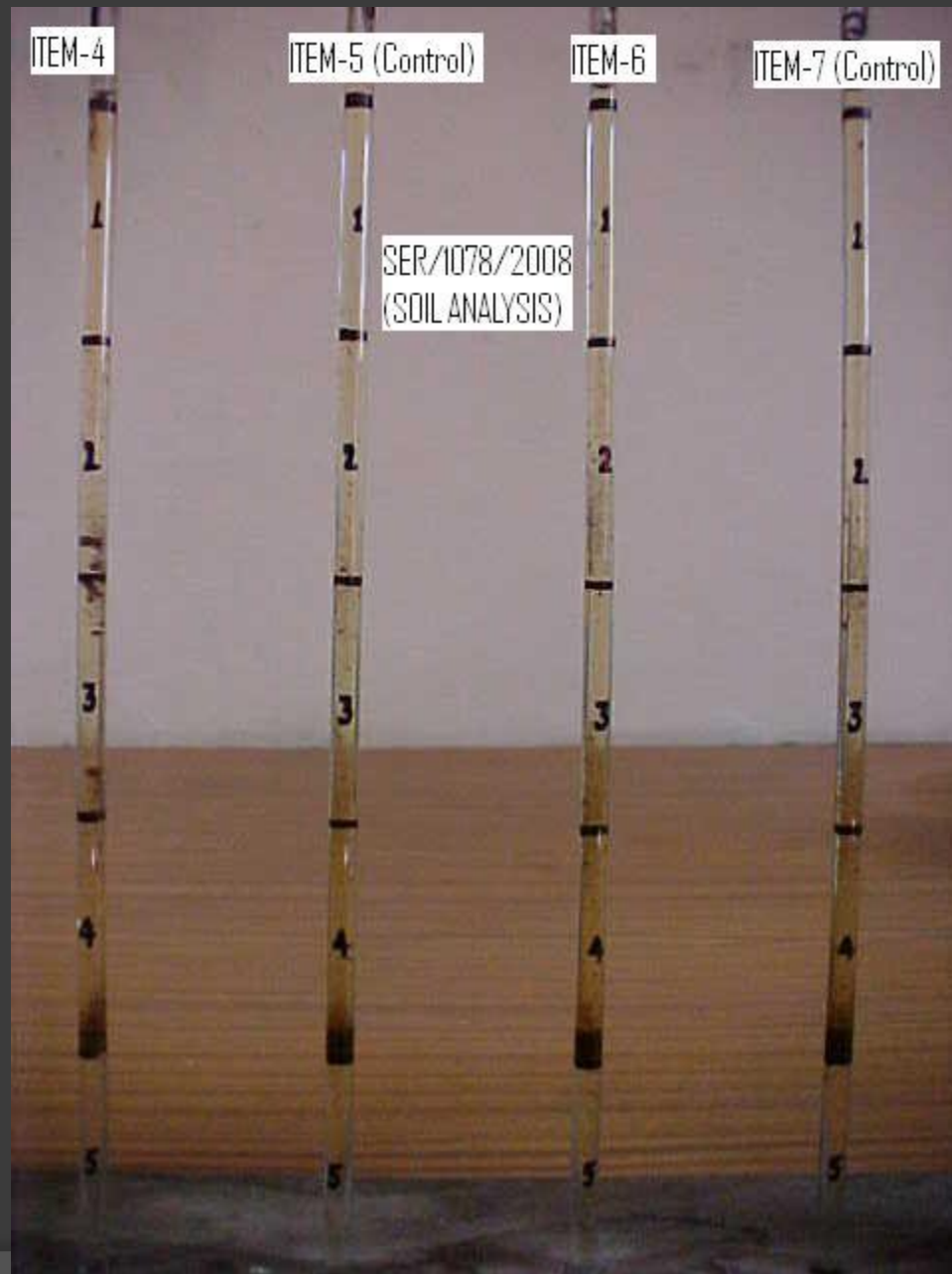
Soil, mud, dust and debris

EXAMINATION OF SOIL

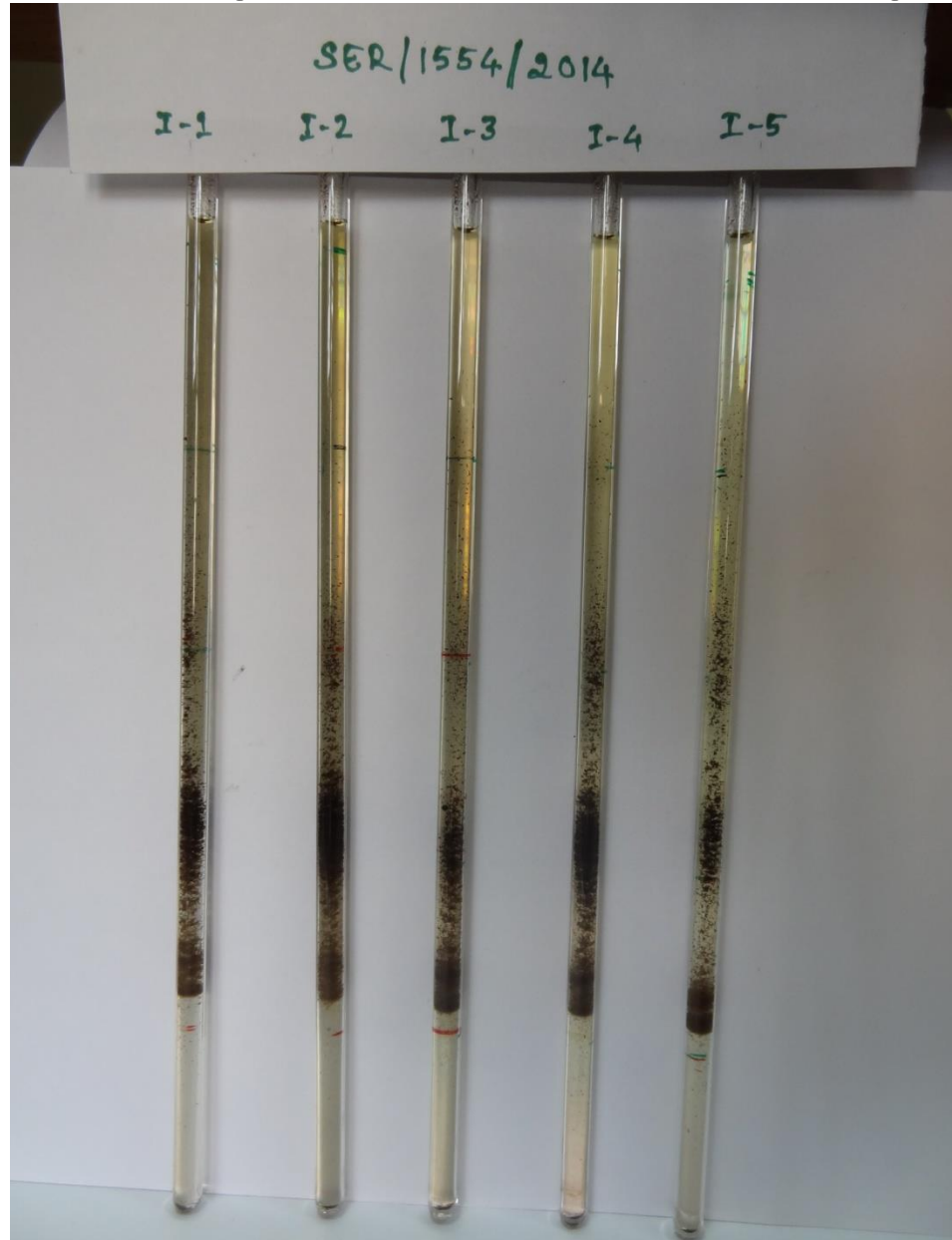
■ METHODS OF EXAMINATION:

- Macroscopic examination
- Microscopic examination
- Ultra violet fluorescence
- Particle size distribution
- Dry colour
- Ash colour
- Loss on Ignition
- Density Gradient analysis
- Instrumental analysis

Density Gradient analysis



Density Gradient analysis



SPURIOUS

ORIGINAL



SPURIOUS

ORIGINAL



SPURIOUS



ORIGINAL



DUPLICATE CASTROL



ORIGINAL CASTROL



Castrol

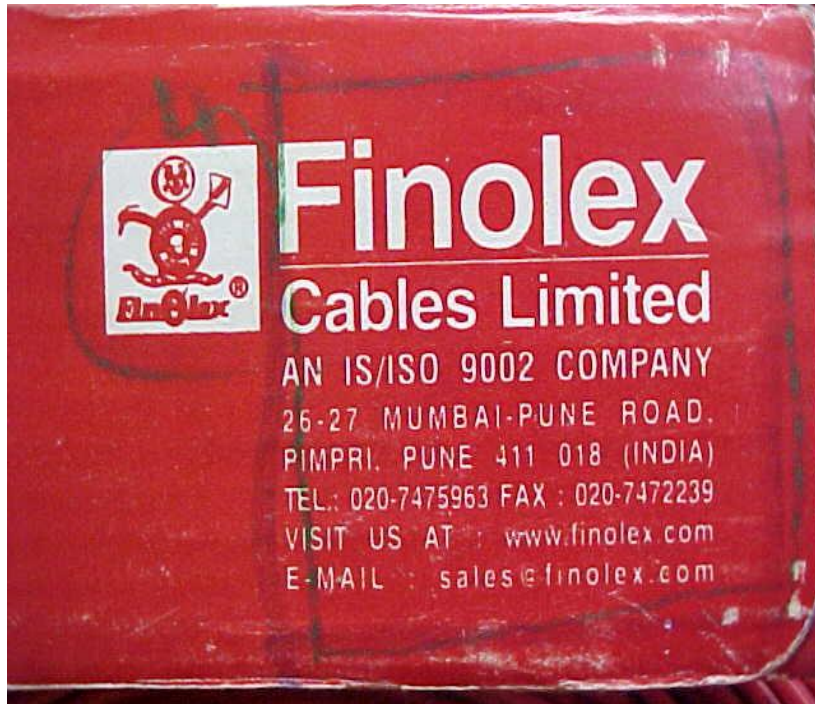
Castrol

SPURIOUS

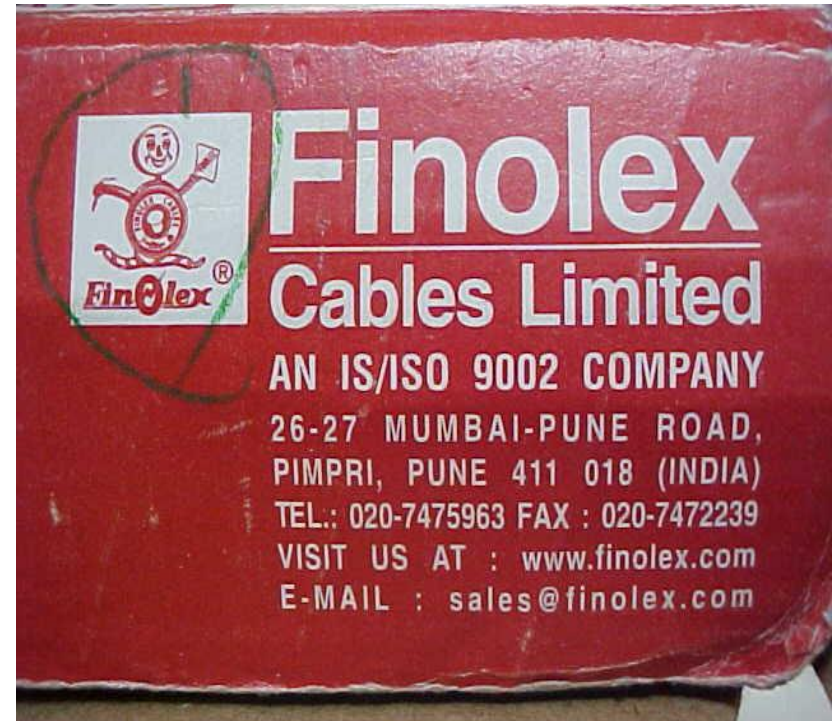
ORIGINAL



SPURIOUS



ORIGINAL

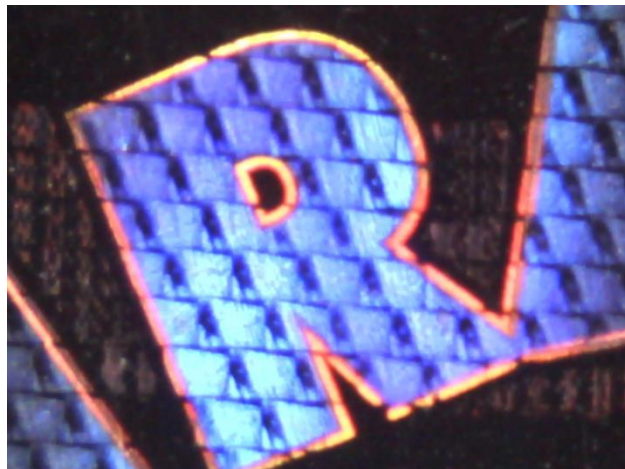
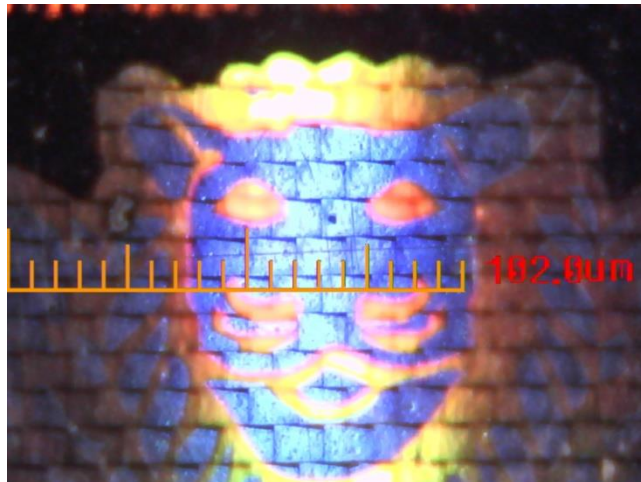




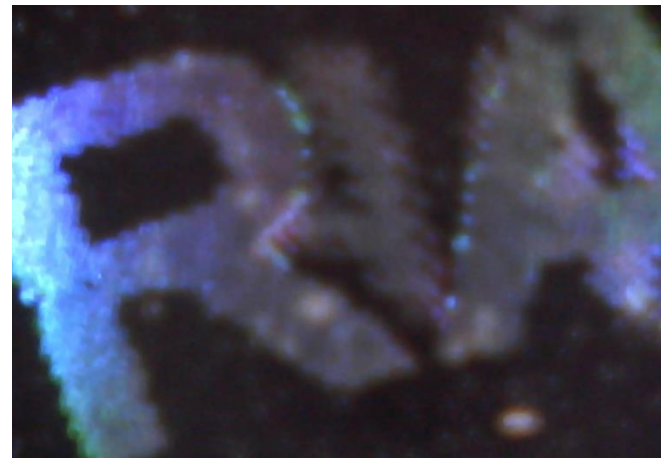
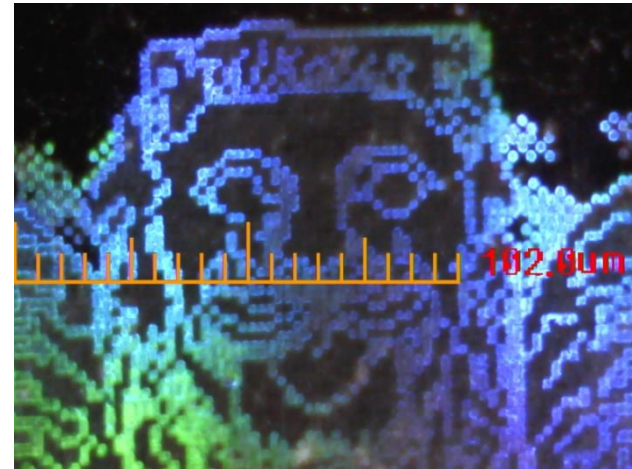


Voter ID Hologram analysis

Genuine



Fake

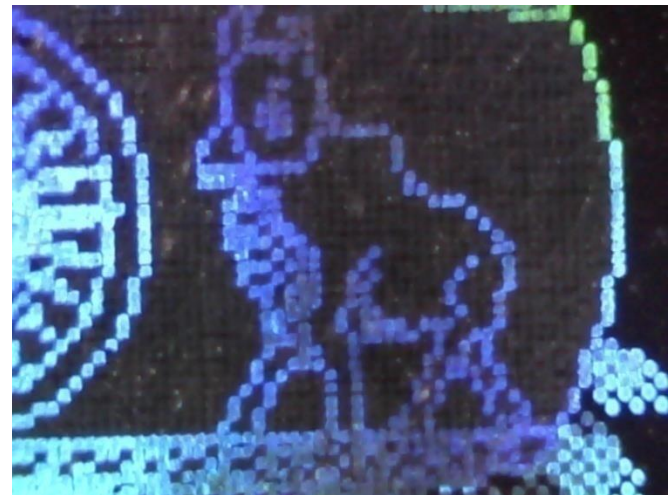


Voter ID Hologram analysis

Genuine



Fake

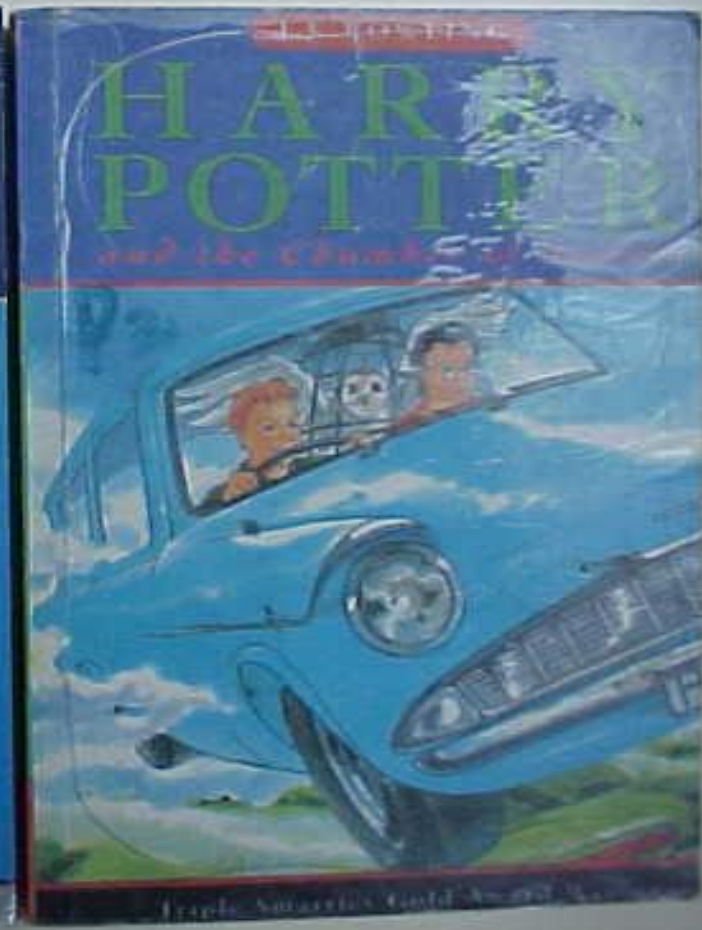
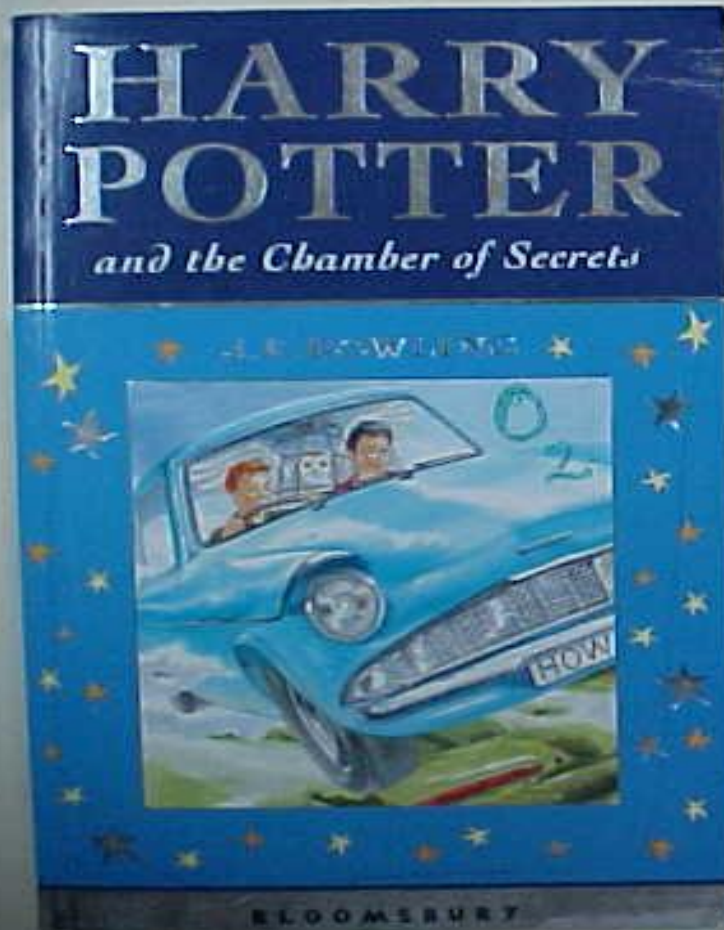


PRINTED DOCUMENTS

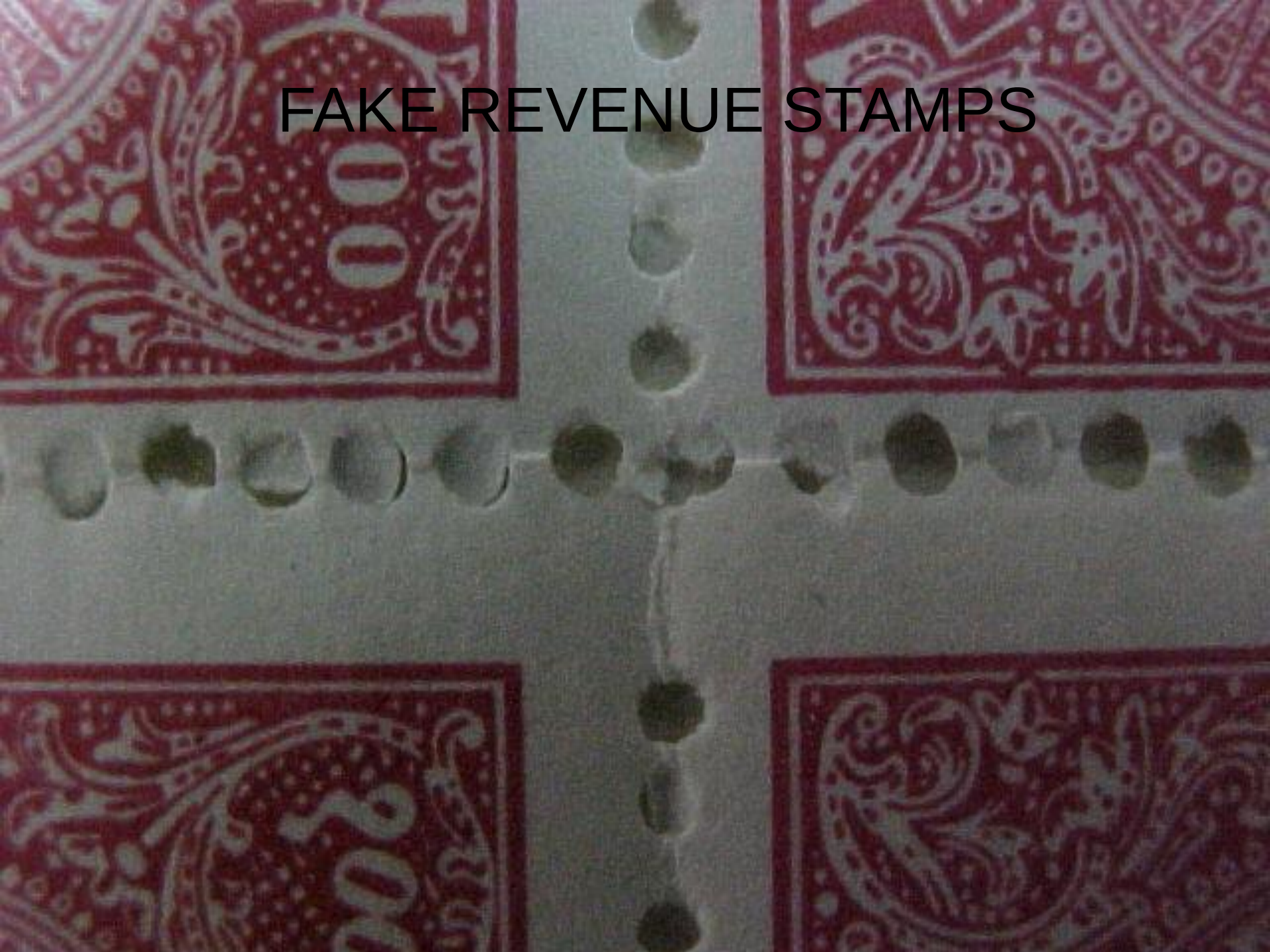
- FAKE PASSPORTS
- PIRATED TEXT BOOKS
- FAKE DEMAND DRAFTS
- FAKE WAY BILLS
- FAKE COURT FEE STAMPS
- FAKE REVENUE STAMPS
- FAKE “FOOD FOR WORK” COUPONS
- FAKE ‘C’ FORMS & VOUCHERS
- FAKE NON-JUDICIARY STAMP PAPERS
- FAKE RUBBER STAMPS &
STAMP IMPRESSIONS

ORIGINAL

PIRATED



FAKE REVENUE STAMPS



GENUINE REVENUE STAMPS



FAKE WAY BILL

NUMBER

2854532

GENUINE WAY BILL

377869

DATE

MONTH

A SHEET OF PASSPORT REMOVED AND
PASTED WITH ANOTHER SHEET
(UNDER U-V LIGHT)

30 DEC 2002

15 OCT 2002

229 DEC 2002

DEPARTED
FROM NEWA

08 OCT 2002

15 OCT 2002

EMPLOYMENT PROHIBITED

8 OCT 2002

22 OCT 2002

15 OCT 2002

18

9

ERASURE MARK OBSERVED
BEFORE NUMERAL "8"

8

Ash Analysis



एस सी SC/
द. म. रे. S.C.R.

प्रथम श्रेणी मुफ्त पास
FIRST CLASS FREE PASS

विभाग Dept. T. P. दिनांक Date 01.7.03
पास Pass Mr. M. A. Azad

पास Pass along with white
only

पदनाम Designation Goods Dr (Net)
कार्यालय Office SSIN2B

From से
To तक

Via NRB MNR होकर
Over SC, C रेलों पर Rlys.

और वापसी में AND RETURN
Via Same होकर

To तक
Over रेबों पर Rlys.

Available upto अवधि 31.10.03..... तक
यात्रा विराम की अनुमति

Permission to B/J at
बहिर्यात्रा Outward Journey. N₂B₁J₁...

बापसी यात्रा Return Journey

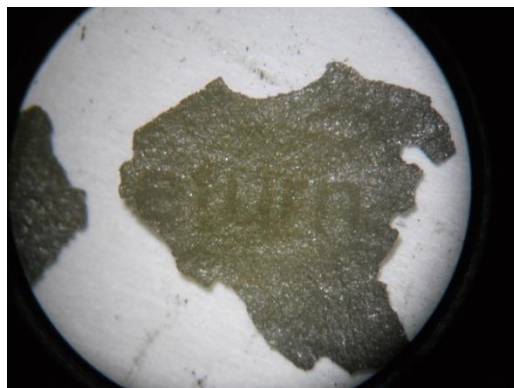
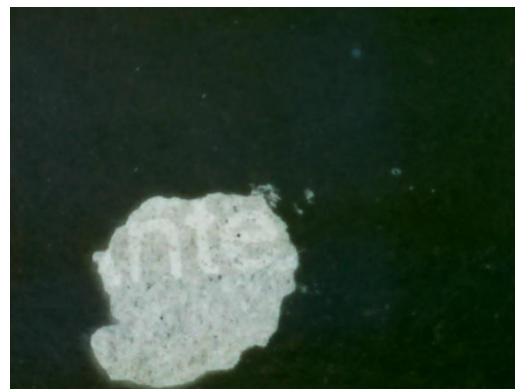
.....
 क्यों दिया गया Why Granted.....

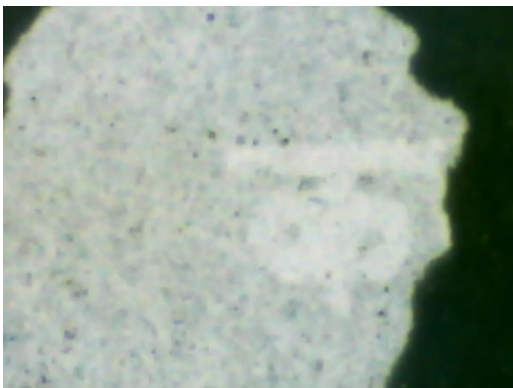
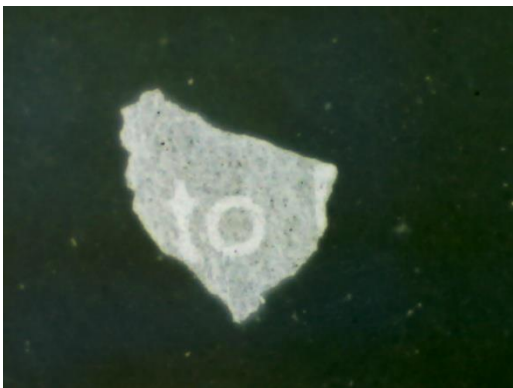
हस्ताक्षर Signature

पदनाम Designation.....

Station Superintendent
S. C. Ry. NIZAMABAD

Counter foil as control





Tool Mark



TOOL MARKS



FOOT PRINTS / TRACK MARKS

- ✓ Track marks can be defined as the prints or impressions left by the criminal, his vehicle in and around the crime scene during the commission of the offence.
- ✓ Found in both - bodily and property offences.

They are in the form of

- Foot prints,
- Footwear prints,
- Tyre marks,
- Skid marks of vehicles,
- Drag marks



Blood stained foot print at scene of offence



Suspected foot print taken from accused



Super imposition



Collected from scene of offence

Sample foot print of suspected person



Collected from scene of offence

Sample foot print of suspected person

Tyre marks:

- Tread marks are transferred to the surface when tyre comes in contact with the surface.
- With the help of these tyre marks we can trace the vehicle, so these tyre marks act as track marks.



Tyre marks:

■ Case Study:

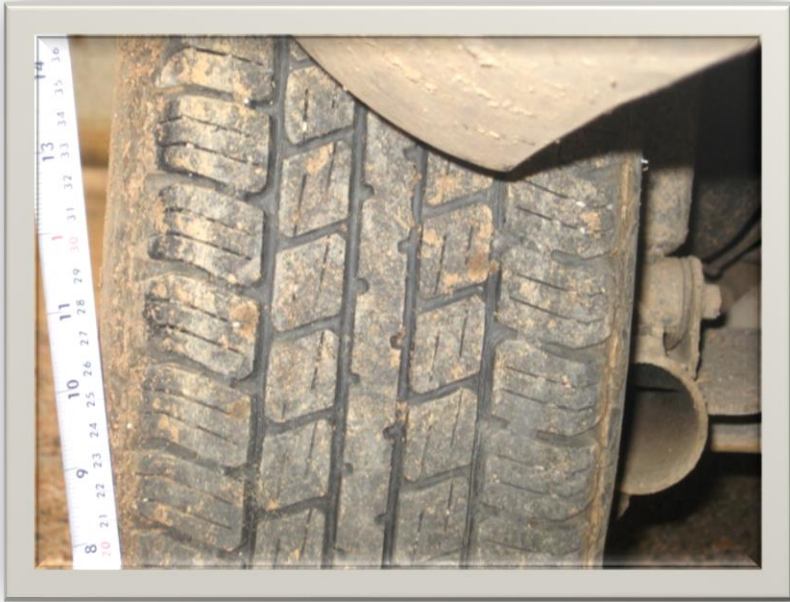
Police got a complaint that a person who is an employee in text book printing press is missing. In the police investigation they found a unknown dead body which face and head was damaged by big stone at city out skirts . The police doubted missing person's car driver and interrogated him.

4
CLUES

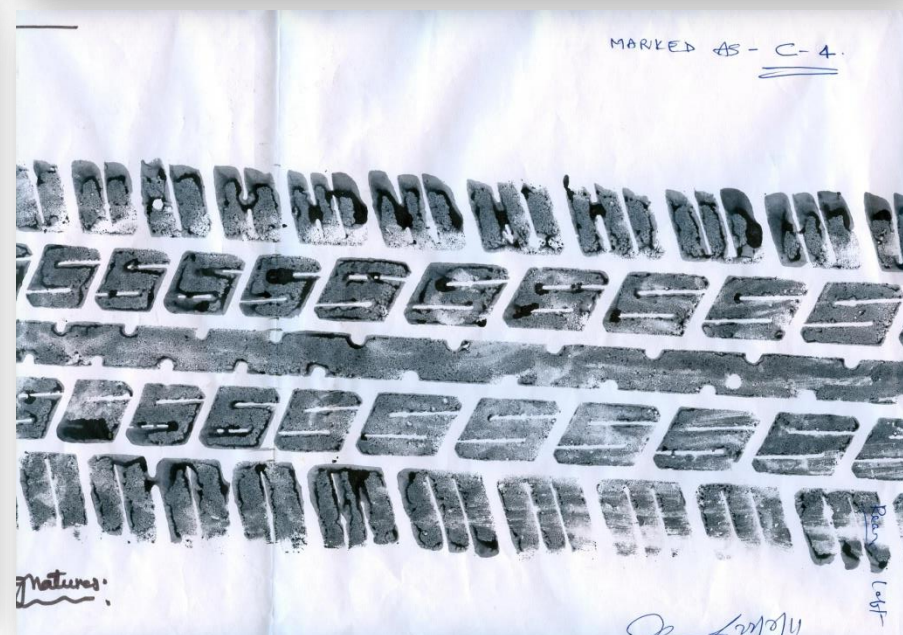
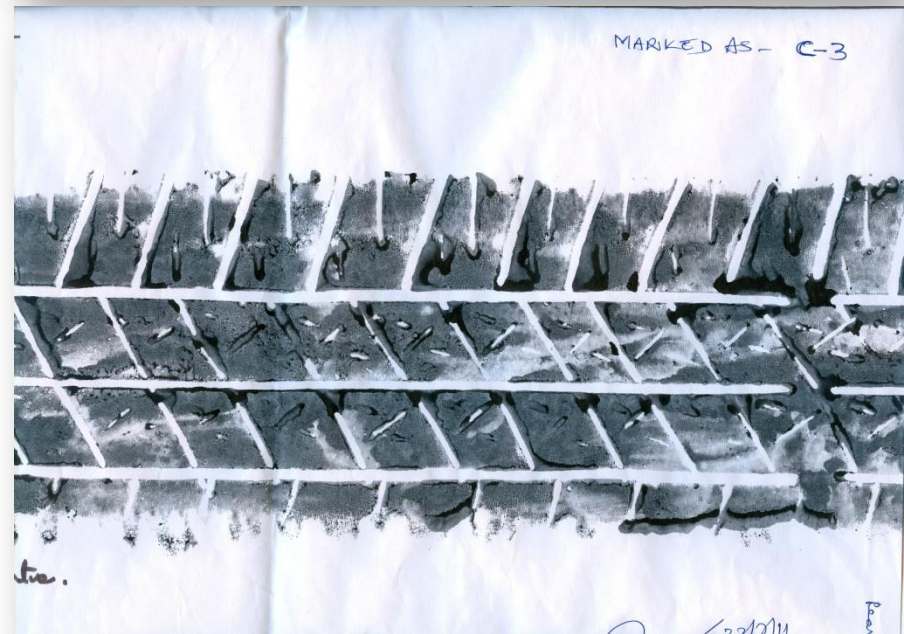


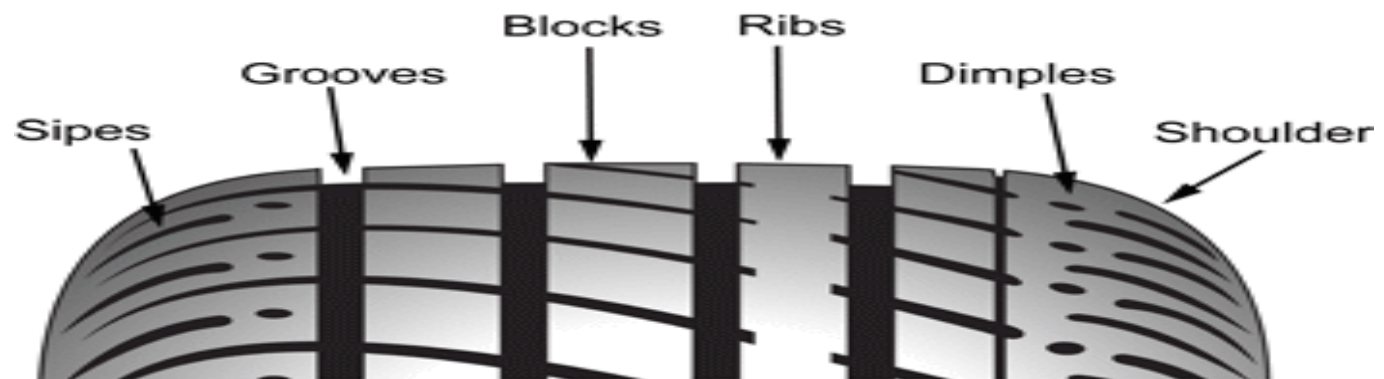
5
CLUES









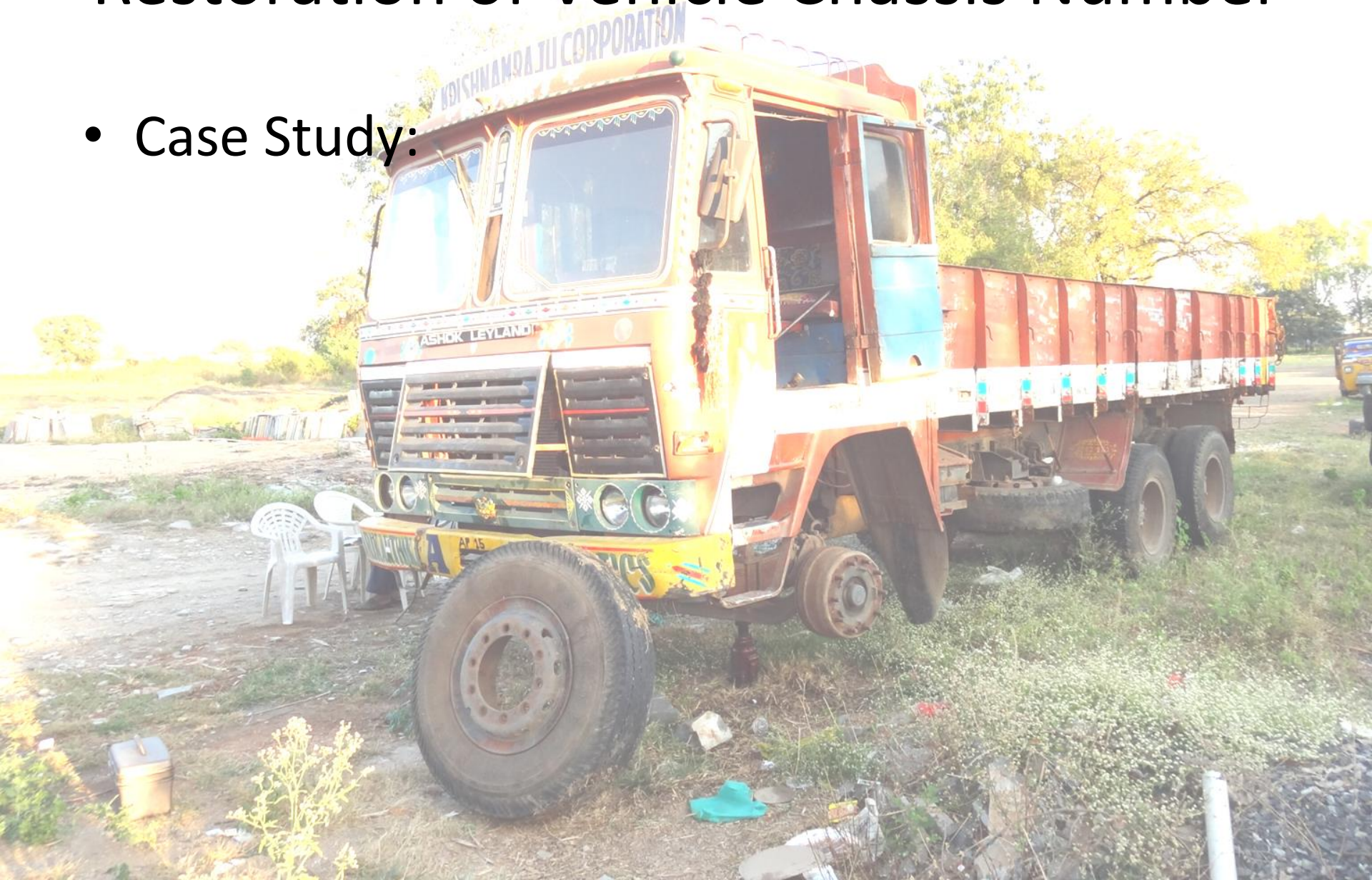


4
CLUES



Restoration of Vehicle Chassis Number

- Case Study:









Existing Chassis No. – **DWH090240**

Deciphered No. - **FPE608388**

EXISTING CHASSIS NUMBER

00C20C05830

CY NO. 208X170/02 . CC.5-18
RTY

AFTER APPLICATION OF ETCHING SOLUTIONS

0C05830

DECIPHERED CHASSIS NUMBER

00F20F01745

00C20C05830



0 1 2 3 4 5 6 7 8 9 &

A

A B C D E F G H I J K L M N O P Q ~~R~~ S
Q R

T U V W X Y Z



FORENSIC ENGINEERING / FAILURE ANALYSIS

- Derailment of train
- Building collapse
- Cement, mortar analysis etc.,

PIECE OF RAIL WITH CRIME CUT



OTHER PIECE OF RAIL WITH CRIME CUT



CROSS SECTION OF CRIME CUT



**CROSS SECTION SHOWING CUT WITH
IMPLEMENT AS WELL AS BROKEN AREA**



TEST CUT DONE BY HACK-SAW AND BROKEN
AT THE BOTTOM EDGE



TEST CUT MADE WITH POWER HACKSAW



GAS WELDING CUT





Thank You
Thank You
Thank You!!!!