

# GSR, Serial Number Restoration & Trace Metal Detection

## GSR, Serial Number Restoration & Trace Metal Detection

According to the National Institute for Justice (NIJ), 467,321 persons were victims of a crime committed with a firearm in 2011. The impact felt by communities where explosive devices were used to commit crimes can be immeasurable. Criminals try to stay one step ahead of the law by attempting to remove the serial numbers from the weapons they have used or the items they have stolen. Law enforcement officers need reliable, high quality tools that help them to investigate those especially heinous crimes where guns, explosives, weapons, or loss of property were involved.

Sirchie provides reliable tests for gun shot and explosives residue, serial number restoration, and trace metal detection to aid the investigator in the pursuit of justice.



*In this section you will find reagents and equipment for:*

- *Detection and collection of firearms discharge and gunpowder particles*
- *Explosive nitrate residue screening*
- *Detection of trace metal contact*
- *Restoration of erased or destroyed serial numbers and ID marks*

### **EDUCATION OPPORTUNITY!**

We offer a 40-hr, onsite course that teaches law enforcement professionals the essentials of the collection, processing, and preservation of evidence.



*For more information see the Training Section of this catalog or visit our website at [www.sirchie.com](http://www.sirchie.com)*

## DETECTING FIREARM DISCHARGE RESIDUE



1. Swab the entire palm surface of suspect's hand for any residue.



2. Swab back side of suspect's hand for residue.

### SUMMARY OF AAA100 TESTING RESULTS\*

ITEM	MICROGRAMS	
	BARIUM	ANTIMONY
5% HNO (6 drops)	0.00	0.00
Cotton Swab**	0.02	0.00

\*Testing performed by the forensic staff of the national office laboratory.  
\*\*Average of 5 analyses.

#### LABORATORY CONCLUSION:

"From the above values, the materials are quite pure and will be ideal for use in production-run kits."

### AAA100 CONTENTS:

(10 Tests Containing)

- 1- KCP123 Dispenser, 5% Nitric Acid w/ Controlled Flow Applicator and Cap, 3ml
- 6- AAA1001-AAA1006 Vials, Contaminant-Free w/12mm Polypropylene Closures w/ Polyethylene Specimen Swabs, 2.5" (6.3cm)
- 1- EIL021 Police Seal Warning Label
- 1- SF00761 Latex, Powder Free Glove Pair
- 1- KCP120 Case, Molded Styrene; Dimensions: 4.625" x 3.5" x .875" (11.7cm x 8.9cm x 2.2cm)

## PRIMER RESIDUE TRACES

When a weapon is fired, gunpowder residues are propelled toward the target. Primer and gunpowder residues are also blown back in the direction of the shooter. In most cases, trace amounts of these residues are deposited on the shooter's firing hand. The detection of these trace residues can give valuable information regarding whether or not a particular individual has recently fired a weapon. The collection of primer residues deposited on the hand of the shooter—normally on the thumb web and the back of the hand holding the weapon, is accomplished through sampling for SEM or AAA analysis. Determining whether or not a person has fired a weapon is normally accomplished by measuring the amount of barium, lead, and antimony on the suspect's hands. Atomic absorption spectrophotometry analysis has proven to be very successful in identifying these trace residues.



## ATOMIC ABSORPTION ANALYSIS

Atomic Absorption Analysis is considered to be a highly sensitive method for the detection of firearm discharge residue on the skin or clothing of a suspect. The AAA process has been accepted in federal and state courts as admissible evidence in numerous cases.

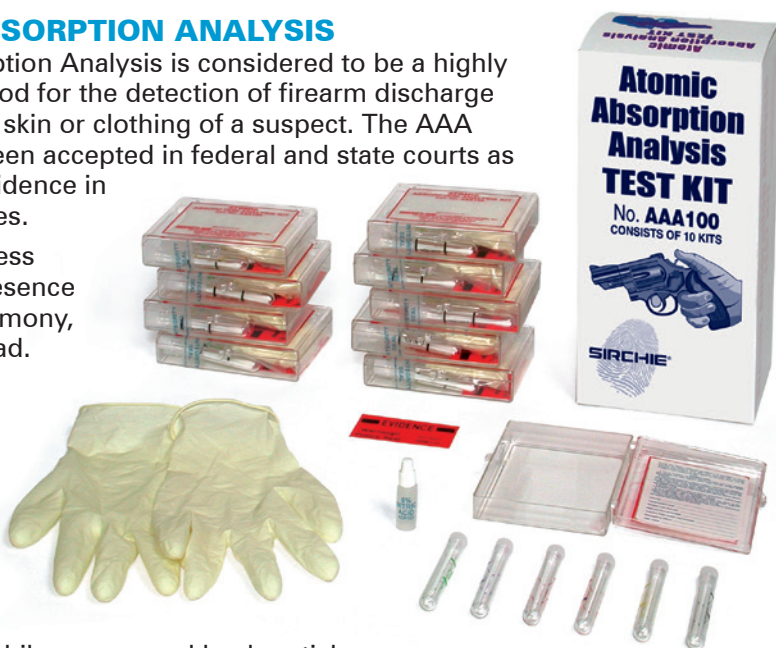
The AAA process detects the presence of barium, antimony, copper, and lead.

Barium and antimony are present in the primers of most United States-made and some European brands of

ammunition, while copper and lead particles originate from cartridge cases and projectiles. Upon detonation of a cartridge, these elements are deposited on the shooter's hands. The AAA100 kits are used to swab the entire surface of the suspect's hands or clothing (see photos on left). The samples taken are then submitted for laboratory analysis.

Due to the extreme sensitivity of atomic absorption analysis, the swabs, preservation tubes, nitric acid solution, and container must be free from contamination.

The AAA100 kit contains 10 individual test kits and the components of each are handled under controlled conditions to ensure absolute minimum contamination.



### CATALOG NO.

AAA100

### DESCRIPTION

Atomic Absorption Analysis Test Kit/10 Test Kits



### PRICE

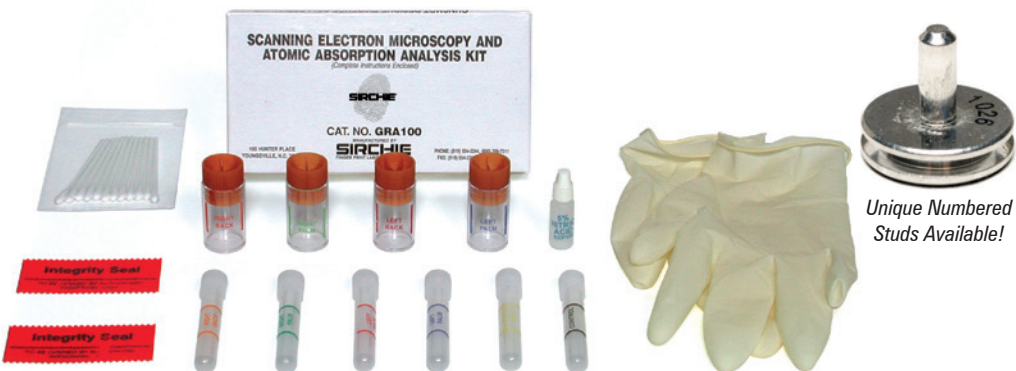
# Primer Residue Collection Kits



## KIT FOR ANALYSIS BY SCANNING ELECTRON MICROSCOPY (SEM)

This trace residue collection kit contains all the necessary items for the uniform recovery of primer residue from a suspected shooter's hand. Access to a (SEM) scanning electron microscope is the only prerequisite.

CATALOG NO.	DESCRIPTION	PRICE
GRA200	Primer Residue Collection Kit for SEM	
GRA200S	Primer Residue Collection Kit for SEM with Numbered Studs	



## COMBINATION KIT FOR ANALYSIS BY SCANNING ELECTRON MICROSCOPY (SEM) AND ATOMIC ABSORPTION ANALYSIS (AAA)

Specifically designed for those departments with access to scanning electron microscopy and atomic absorption analysis. The GRA series gunshot residue analysis kits feature special alloy aluminum specimen mounts containing only trace levels of barium, lead or antimony—the most common constituents in primers. Simply remove the cap with carbon-covered metal stud, apply to the questioned hand area and return the metal stud to its original location in the holder. Specific and sensitive collection for gunshot residue in an economical and uncomplicated kit. Also included in the GRA100 are all the necessary components to collect primer residue for atomic absorption analysis.

CATALOG NO.	DESCRIPTION	PRICE
GRA100	Primer Residue Collection Kit for SEM and AAA	
GRA100S	Primer Residue Collection Kit for SEM and AAA with Numbered Studs	

## GSR, Serial Number Restoration & Trace Metal Detection



Technician collects residue for scanning electron microscopy.

### GRA200 CONTENTS:

- 1- GRA202 Gunshot Residue Collection Vial, Right Palm
- 1- GRA203 Gunshot Residue Collection Vial, Left Palm
- 1- GRA204 Gunshot Residue Collection Vial, Right Back
- 1- GRA205 Gunshot Residue Collection Vial, Left Back
- 1- GRA201 Test Data Label
- 1- Instruction Sheet
- 2- KCP118 Integrity Seals
- 1- SF00761 Latex, Powder-Free Glove Pair
- 1- KCP223 Plastic Box, 7" x 3.5" x 1" (17.8cm x 8.9cm x 2.5cm)



Technician collects residue for scanning electron microscopy.

### GRA100 CONTENTS:

- 1- GRA101 Gunshot Residue Collection Vial, Right Palm
- 1- GRA102 Gunshot Residue Collection Vial, Left Palm
- 1- GRA103 Gunshot Residue Collection Vial, Right Back
- 1- GRA104 Gunshot Residue Collection Vial, Left Back
- 1- KCP124 Vial, Left Back, Contaminant Free
- 1- KCP125 Vial, Right Back, Contaminant Free
- 1- KCP126 Vial, Left Palm, Contaminant Free
- 1- KCP127 Vial, Right Palm, Contaminant Free
- 1- KCP128 Vial, Cartridge Case, Contaminant Free
- 1- KCP129 Vial, Control, Contaminant Free
- 1- SF00761 Latex, Powder Free Glove Pair, Ambidextrous
- 1- KCP123 Polyethylene Dispenser, 5% Nitric Acid w/Controlled Flow Applicator and Molded Protective Cap, 3ml
- 2- KCP118 Integrity Seals
- 1- GRA100C Carton, 6.5" x 3.25" x 1.25" (16.5cm x 8.2cm x 3.2cm) w/Attached Integrity Seals
- 1- Instruction Sheet

## GSR, Serial Number Restoration & Trace Metal Detection

### GRA300 CONTENTS:

- 1 - Factory sealed, tamper-evident Kit Envelope, 6" x 9"
- 1 - Instruction Sheet
- 1 - GRA Information Form
- 1 - Pair, Disposable Latex Gloves
- 1 - Right Hand Vial with SEM Stud
- 1 - Left Hand Vial with SEM Stud
- 1 - Evidence Seal to insure Kit Integrity after Evidence Collection

### DETECTING RESIDUE ON CLOTHING WITH GPD100



1. Spray prepared reagent solution over entire surface of gunpowder detection contact paper and place directly over the area of clothing to be tested.



2. Place sheet of untreated contact paper on top of treated sheet and apply pressure over entire area of sheet.



3. Positive test results for nitrate is indicated by the appearance of orange specks within 2 minutes of application.

### GPD100 CONTENTS:

- 6- GPD01 Gunpowder Particle Reagent A, 1/6 dram (0.6ml)
- 6- GPD02 Gunpowder Particle Reagent B, 1 oz. (30ml)
- 12- GPD03 Gunpowder Detection Paper
- 1- SB4 Spray Bottle, 4 oz. (118ml)
- 12- GPD05 Gunpowder Particle Removers
- 1- GPD100C Molded Copolymer Case w/Molded Plastic Inserts; Dimensions: 12.125" x 7.25" x 4.5" (30.8cm x 18.4cm x 11.4cm); Weight: 3.25 lbs. (1.5kg)

## Firearms Discharge Residue Analysis

### PRIMER RESIDUE COLLECTION KIT FOR SEM (2 STUB)

The GRA300 is designed for use by departments that anticipate submitting evidence for Scanning Electron Microscopy (SEM). The GRA series kits feature special alloy aluminum specimen mounts that contain only trace levels of barium, antimony, or lead—the most common constituents in cartridge residue. GRA tests are specific and sensitive for collection of gunshot residue using SEM techniques, are economical, and are not complex.



CATALOG NO.	DESCRIPTION	PRICE
GRA300	Primer Residue Collection Kit for SEM, 2 Stud	
GRA300S	Primer Residue Collection Kit for SEM, 2 Stud with Numbered Studs	

### GUNPOWDER PARTICLE DETECTION KIT

The distance of a firearm discharge is an important factor in crime scenes.

The close range firing in a suicide, murder, or other crime involving firearms can be determined by the detection of powder particles. A study of the scorching, blackening, and powder patterns on the object or victim at the crime scene can tell much about the distance and angle of firing. Dark rings around the bullet hole due to abrasion or dirt can be confused with charring and blackening resulting from discharge. Small gunpowder particles, however, may go unnoticed if a sensitive method is not used. Therefore, a chemical test for the nitrate (burned) particles of gunpowder is very useful in a study of crime scenes involving firearm discharges—both on the victim and the criminal.



The two-step reaction involved in the formation of orange dye is known as diazotization and coupling. It is this combination of reactions that is specific for nitrate ions. The GPD100 kit provides a sensitive and specific method for the detection of nitrite particles at the crime scene. The sensitivity of the test eliminates the possibility of omission and error attending visual examination of the crime scene. By utilizing this kit, it is possible to distinguish between close-range and distant firearm discharge. Close-range firing and approximate distances can be determined by the powder tattooing on the body or clothing of the victim. After the development of nitrate particles, test paper should be photographed for a permanent record of particle dispersion.

CATALOG NO.	DESCRIPTION	PRICE
GPD100	Gunpowder Particle Detection Kit	



# Firearms and Trace Metal Detection

## MASTER FIREARMS DETECTION KIT

This is a necessary kit for the investigation of any crime involving the use of firearms. Specific detection of primer residues (antimony and barium) and the determination of contact with a weapon (trace metal) can be performed. All the components are pre-measured, packaged, and contaminant-free for excellent sensitivity and unlimited laboratory testing.



CATALOG NO.	DESCRIPTION	PRICE
MFD200	Master Firearms Detection Kit	
MFD200R	Consumable Refill Pack (in Red)	

## TRACE METAL DETECTION KIT

The trace metal detection technique (TMDT) makes metal trace patterns visible on skin and clothing that has been treated with a test solution and then illuminated by shortwave ultraviolet (254nm) light. Examination allows an investigator to determine whether or not a suspect has been in contact with certain metal objects.



CATALOG NO.	DESCRIPTION	PRICE
TMDT100	Trace Metal Detection Kit	
TMDT100R	Consumable Refill Pack (in Red)	

## GSR, Serial Number Restoration & Trace Metal Detection

### Firearms Discharge Tests included in the MFD200 are:

- Atomic Absorption Analysis (AAA)
- Scanning Electron Microscopy (SEM) to test for: Barium, antimony, copper, and lead
- Trace Metal Detection Technique (TMDT) to test for: All metals

### MFD200 CONTENTS:

- 4- AAA10 Atomic Absorption Analysis Kits
- 4- SF00761 Latex, Powder-Free Disposable Glove Pairs, Ambidextrous
- 4- KCP230 AA-Cell Batteries, Alkaline
- 1- SB4 Spray Bottle, 4 oz. (118ml)
- 1- SWL100 Shortwave UV Light Source, 6V DC, 4-watt Bulb
- 3- TMDT01 Trace Metal Reagents, 1 oz. (30ml)
- 1- GRA200 (SEM) Scanning Electron Microscopy Collection Kit
- 1- MFD2001 Carrying Case, Molded Copolymer with Molded Plastic Inserts; Dimensions: 17.5" x 10.25" x 8.625" (44.4cm x 26cm x 21.9cm); Weight: 6 lbs. (2.7kg)



Suspect's hand before the reagent application.



After reagent application and shortwave UV exposure, trace metal is detected.

### TMDT100 CONTENTS:

- 12- FPT1 Super Cleaner Towelettes
- 4- KCP230 AA-Cell Batteries, Alkaline
- 1- SB4 Spray Bottle, 4 oz. (118ml)
- 1- SWL100 Shortwave Ultraviolet Light Source, 6V DC, 4-watt bulb
- 4- TMDT01 Trace Metal Reagents, 1 oz. (30ml)
- 1- TMDT1001 Carrying Case, Molded Copolymer w/Machined Plastic Insert; Dimensions: 12.125" x 7.25" x 5.5" (30.8cm x 18.4cm x 14cm); Weight: 3 lbs. (1.4kg)

## HOW TO USE:



1. A grain of suspect material is added to an extract retention vial.



2. Enough ER1 extract reagent is transferred to cover the material.



3. 290P2 reagent will turn blue or black if suspect material tests positive.

## ERTT10 CONTENTS:

- 20- 288DP Pipettes, Disposable, w/ Capillary and 3ml Bulb
- 10- 290P2 P2 Color Developing Reagent, Ampoules, 2ml
  - 1- ACN2 Acid Neutralizer, 2 oz (59ml)
- 3- EIL011 Evidence Identification Labels, "Crime Evidence"
- 10- ER1 Extract Reagent 1, Ampoules, 1ml
- 1- KCP139 Tweezers, Plastic, 4.75" (12.1cm)
- 1- KCP140 Spatula, Stainless, Micro
- 3- KCP173 Vial, Glass, 1/2 oz. w/Closure
- 10- KCP174 TLC Plates, Silica Gel 60A, 250µm Layer, 5cm x 10cm
- 1- KCP191 Box of 100 capillaries and holder
- 15- KCP217 Cotton Balls
- 10- KCP171 Vials, Glass, w/Closure, 1/2 dram
- 1- SF00771 Latex Powdered Glove Pair, Ambidextrous, .005" thick, Lg.
- 1- ERTT101 Carrying Case, Molded Copolymer, w/Latch; Dimensions: 16.25" x 7.25" x 8.625" (41.6cm x 21.9cm x 17.8cm); Weight: 4 lbs. (1.8kg)

## BV100 CONTENTS:

- 10- Crushable Ampoules
- 10- Gunpowder Particle Collection Lifters
- 1- Straight handle magnifier

## EXPLOSIVES RESIDUE TEST KIT

This kit provides rapid screening for explosive residue to verify the presence of nitrates. Due to improvements in testing technique, the process is extremely sensitive and ideal for field or lab use. Tests have been performed with debris the size of a grain of salt—while not conclusive for the presence of explosives, it is an effective screening tool for pinpointing "hot" locations.



### CATALOG NO.

ERTT10

### DESCRIPTION

Explosives Residue Test Kit

### PRICE



## GUNPOWDER PARTICLE TEST KIT

The BlueView™ Gunpowder Particle Test Kit is a fast, reliable field test for detection of trace nitrates found in gunpowder. When a weapon is fired, gunpowder is blown back in the direction of the shooter and trace amounts of these residues are deposited on the shooter's firing hand or clothing. Detection of these trace residues can give valuable information regarding whether or not a particular person may have recently fired a weapon.

**SIRCHIE®** offers this presumptive field test kit in a simple-to-use pouch format that can be deployed without any specialized training or equipment and results appear in seconds. This format will allow for presumptive on-the-spot testing at crime scenes or anywhere a suspect may be apprehended. Simply press the special collection lifter against the back and palm surfaces of both the suspect's hands or clothing. Place the included ampoule in the center of the lifter and return to the pouch. Fold over the top of the pouch, replace the clip and crush the ampoule. Shake well. If gunpowder particles are present, blue specks and/or smears will appear within a few seconds.

### CATALOG NO.

BV100

### DESCRIPTION

BlueView™ Gunpowder Particle Test Kit/Box of 10 Tests

### PRICE



# Serial Number Restoration

## GSR, Serial Number Restoration & Trace Metal Detection

### SERIAL NUMBER RESTORATION GEL

RESTOR-A-GEL™ enables investigators to perform restoration in the field on metal surfaces. The gel consistency of the reagent permits application with a spatula to either a vertical or horizontal surface. No damming or tear-down of engine is required; applies just like grease. Gel reagents have 50% more concentration for minimum etching time; also can be used with our 284A Accelerator.

CATALOG NO.	DESCRIPTION	PRICE
RAG1001	Restoration Gel for Steel, 1 oz., (30ml)	
RAG2001	Restoration Gel for Aluminum, 1 oz., (30ml)	
RAG3001	Restoration Gel for Copper, 1 oz., (30ml)	
NIA	Serial Number Restoration Liquid, Aluminum, 0.25 oz. (4ml)	
NIC	Serial Number Restoration Liquid, Copper, 0.25 oz. (4ml)	
NIS	Serial Number Restoration Liquid, Steel, 0.25 oz. (4ml)	



### RESTOR-A-GEL™ FEATURES:

- Gels for aluminum, copper, and steel
- Increased concentration
- Simplified application
- Use on horizontal or vertical surfaces
- Apply to surfaces previously impossible to etch
- Relatively inexpensive compared to liquid etching solutions

### RESTOR-A-GEL™ NUMBER RESTORATION KIT

This is a complete kit containing the necessary reagents to restore serial numbers and other identifying characteristics that have been destroyed—leaving no visible tracks. Obliterated marks on ferrous and non-ferrous metals can be restored to visibility with RESTOR-A-GEL™ compounds.



### RAG500 CONTENTS:

- 1- ACN2 Acid Neutralizer, 2 oz. (59ml)
- 6- KCP163 Emory Papers, 2" x 3" (5.1cm x 7.6cm)
- 1- KCP207 Vial, Amber, w/Snap-On Cap, 30 dram
- 6- KCP209 Stirrers, Wood
- 15- KCP217 Cotton Balls
- 2- RAG1001 RESTOR-A-GEL™ for Steel, 1 oz. (30ml)
- 2- RAG2001 RESTOR-A-GEL™ for Aluminum, 1 oz. (30ml)
- 2- RAG3001 RESTOR-A-GEL™ for Copper, 1 oz. (30ml)
- 1- RAG5003 Metal Surfacing Solution, 2 oz. (59ml)
- 1- RAG5004 Aluminum Surfacing Solution, 2 oz. (59ml)
- 1- SF00771 Latex Powered Glove Pair, Ambidextrous
- 1- KCP168 Bastard File
- 1- RAG500C Molded Copolymer Case w/Molded Plastic Inserts; Dimensions: 12.125" x 7.25" x 4.5" (30.8cm x 18.4cm x 11.4cm); Weight: 3.25 lbs. (1.5kg)

CATALOG NO.	DESCRIPTION	PRICE
RAG500	RESTOR-A-GEL™ Number Restoration Kit	
RAG500R	Consumable Refill Pack (in Red)	

### SERIAL NUMBER RESTORATION REAGENTS FOR PLASTICS

Restore the original manufacturer's stamped serial numbers on most commercially available plastics, including items such as TVs and stereo equipment with RESTO-PLAS™. Just apply the special reagent to the surface, air dry, then apply direct heat with a hot air dryer. Ground off numbers pop up for easy recording and photographing. Each reagent test unit includes 4 ml of plastic etching reagent in a resealable glass vial and four cotton-tip applicator swabs.

CATALOG NO.	DESCRIPTION	PRICE
RPR1006	Restoration Reagents for Plastic, 6 pk.	



## 284A FEATURES:

- Battery-operated for convenience and portability
- Variable current (use MIN for copper, aluminum and other soft metals; use MAX for steel, iron and all very hard metals)
- Use with liquid or "gel" reagents

## 284A SPECIFICATIONS:

- Housing: Black, ABS injection molded
- Power Source: 4 "D" alkaline batteries
- Probe Cord: 3 ft. (91.4cm) Cord, one phone plug, one alligator clip
- Probe, Large: 2"L x .5"W (2.5cm x 1.3cm) brass electrode, phone plug adapter
- Probe, Small: 1"L x .5"W (2.5cm x 1.3cm) brass electrode, phone plug adapter
- Dimensions: 6.5"W x 4.25"D x 2.5"H (16.5cm x 10.8cm x 6.3cm)
- Weight (w/out batteries): .96 lbs. (.4kg)

## MNR100 CONTENTS:

- 1- 284A Field Model Restoration Accelerator
- 1- KCP168 File, Bastard
- 4- KCP235 D-Cell Batteries, Alkaline
- 3- 288DP Pipettes, Disposable, w/capillary and 3ml Bulb
- 1- ACN2 Acid Neutralizer, 2 oz. (59ml)
- 6- KCP163 Emory Papers, 2" x 3" (5.1cm x 7.6cm)
- 1- KCP197 Jar, 8 oz. (237ml) Polystyrene, 70/400
- 6- KCP209 Stirrers, Wood
- 15- KCP217 Cotton Balls
- 2- NIA Restoration Reagent for Aluminum, 1/8 oz. (3.7ml)
- 2- NIC Restoration Reagent for Copper, 1/8 oz. (3.7ml)
- 2- NIS Restoration Reagent for Steel, 1/8 oz. (3.7ml)
- 2- RAG1001 RESTOR-A-GEL® for Steel, 1 oz. (30ml)
- 2- RAG2001 RESTOR-A-GEL® for Aluminum, 1 oz. (30ml)
- 2- RAG3001 RESTOR-A-GEL® for Copper, 1 oz. (30ml)
- 1- RAG5003 Metal Surfacing Solution, 2 oz. (59ml)
- 1- RAG5004 Aluminum Surfacing Solution, 2 oz. (59ml)
- 1- SF00771 Latex Powdered Glove Pair, Ambidextrous
- 1- STM1003 Modeling Clay, 1/4 lb. (93g)
- 1- MNR100C Molded Copolymer Carrying Case with Molded Plastic Inserts  
Dimensions: 17.5" x 10.25" x 8.625"  
(44.4cm x 26cm x 21.9cm);  
Weight: 11.1 lbs. (5kg)

# Serial Number Restoration

## FIELD AND LAB RESTORATION ACCELERATOR

This electrolytic-acid etching accelerator is for use in restoring obliterated serial numbers and other identifying marks that have been removed by filing or grinding. It operates from self-contained dry cell 1.5 volt "D" batteries for maximum portability and flexibility. This compact, lightweight model is ideal for field or lab use.



CATALOG NO.	DESCRIPTION	PRICE
284A	Field and Lab Restoration Accelerator w/ Batteries	

## MASTER NUMBER RESTORATION KIT

This is a complete kit for use in the field or lab and permits the use of liquid etching reagents in resealable glass ampoules or the RESTOR-A-GEL® reagents. It includes all the necessary support equipment and the 284A restoration accelerator. Identifying marks on iron, steel, aluminum, copper, and their alloys may be restored with ease using this kit. Complete instructions with application recommendations are included.



CATALOG NO.	DESCRIPTION	PRICE
MNR100	Master Number Restoration Kit	
MNR100R	Consumable Refill Pack (in Red)	