

CBP Laboratory Topics

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U.S. Customs and
Border Protection

So What? Who Cares?

- Mission: To safeguard America's borders thereby protecting the public from dangerous people and materials while enhancing the Nation's global economic competitiveness by enabling legitimate trade and travel
 - *Materials: prohibited and legal ...*
 - *Entry: borders, airports, shipping ports*
 - *Conveyances: Rail, car, ship, plane ...*
- Problems needing solutions
 - *Detecting and identifying controlled substances*
 - *International Mail screening (~1 million parcels per day per facility)*
 - *Trade commodities origin, characterization, and composition*
 - *Remote and satellite laboratory operations*
- Methods for people with solutions to work with CBP
 - *DHS Science & Technology – the R&D arm of the Department!*
 - *LSSD-sponsored studies*



Scope

Employed:

- 59,178 Men and Women, including:
 - 23,079 CBP officers
 - 2,423 CBP Agriculture specialists
 - 19,437 Border Patrol agents
 - 610 Air Interdiction agents (pilots)
 - 337 Marine Interdiction agents
 - 256 Aviation Enforcement agents
 - 883 Trade Personnel
 - 250 Chemists and Forensic Scientists

Processed Daily:

- 1,088,300 passengers and pedestrians
- 283,664 incoming privately owned vehicles
- 78,137 truck, rail, and sea containers
- \$6.5 billion worth of imported products
- 90,959 entries of merchandise at our air, land, and sea ports of entry
- \$120.5 million in duties, taxes and other fees, including more than \$94.8 million in duties

Seized Daily:

- 5,863 pounds of narcotics
- \$265,205 in undeclared or illicit currency
- \$3.3 million worth of products with Intellectual Property Rights violations

FY 2017 Data



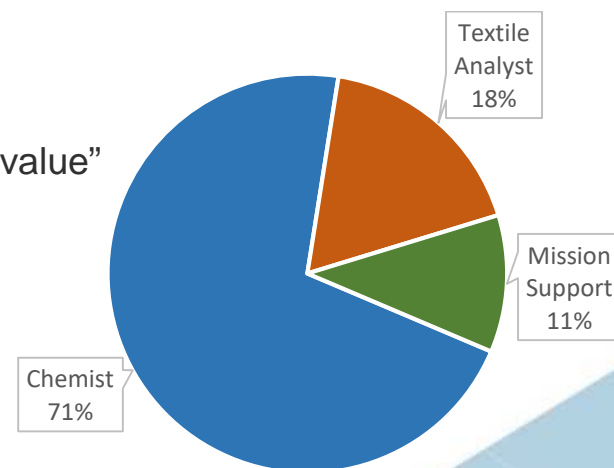
U.S. Customs and
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Vigilance ★ Service to Country ★ Integrity

The CBP Labs

The scientific, technical, and forensic arm of CBP

- Law Enforcement
 - Forensics
 - WMD detection and support
- Trade enforcement
 - Anti-Dumping/ Countervailing Duties
 - Sells a product in the US at a price that is below “normal value”
 - Counterfeit and illegitimate goods
 - Tariff assignment
 - Import safety
 - Trade agreements
- Commercial Gauger/Laboratory Accreditation and Inspection
- Scientific Advice and Assistance



Inorganic

- Country of Origin of Agricultural Products
- Steel
- Tempered Glass
- Fasteners
- Building Stone
- Leaded Crystal
- Ceramics
- Porcelain/Stoneware/ Earthenware
- Au/Ag Money Laundering
- Tableware suitable for food or drink contact



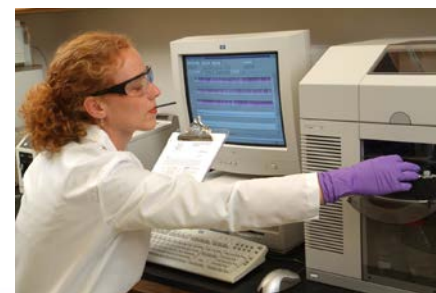
Special Products

- Raw Sugar (Quota)
- Counterfeit Perfume
- Surface-Active Agents
- Candles (Petroleum)
AD/CVD
- Plastics (Monomer Content)
- Rubber (Natural v. Synthetic)
- Toys:
 - Lead Paint
 - Crayons



Food and Organics

- Antidumping and countervailing duties (AD/CVD)
- Antibiotics in Aquaculture
- Saccharin AD/CVD
- COO Honey
- DNA Barcode Species ID
- Food Import Safety
- Vegetable Oil Adulteration
- Animal Origin of Cheese
- Organic Intermediates and Finished Products
- Finishing Agents for Textile, Paper or Leather
- Dyes/Pigments/Inks
- Pharmaceuticals
- Pesticides
- Fertilizers
- Photographic Prods
- Petroleum Products
- Lube Oil Additives
- CFCs



Textiles, Apparel, Coatings, and ...

- Metallized yarns
- Leather (Plastic Coating)
- Water Resistance
- Fiber Content
- Method of Manufacture
- Knitting
- Pile v. non-pile
- Commercial Fraud

- Footwear
- Paper
- Wood
 - Country of origin
 - Species
- Pulp
- Coatings
- Printing Processes

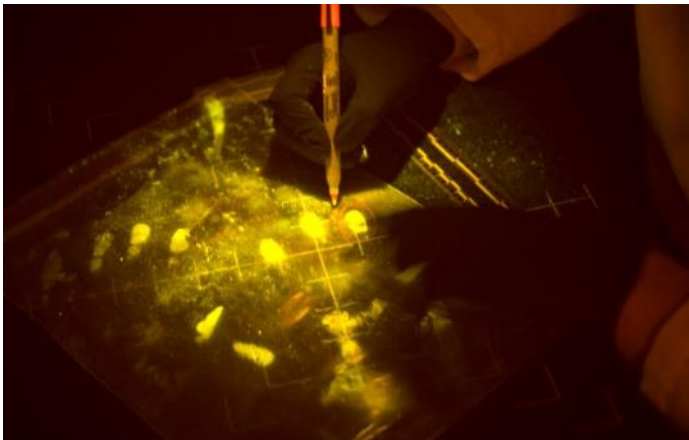
National Petroleum Chemist

- Country of Origin of Crude and Distillate
- Gauger/Laboratory Accreditation and Inspection
- Foreign Trade Zone (FTZ) Evaluation



Forensics and WMD Operations

- Controlled Substances
- Crime Scene Processing and Documentation
- Digital Forensics
- Latent Print Development
- Latent Print Comparison
- Photography
- Radiation Detection and Identification
- Explosive Detection
- Chemical/Biological Agent Detection
- Segregation of contaminated cargo
- Mobile Operations



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Lab Instrumentation (partial)

AccuTOF-DART	DNA sequencer	Inductively coupled plasma (ICP) mass spectrometry	Protein quantification	Spark Optical Emission Spectrometry
Alpha-beta meter	Dumas protein nitrogen analyzer	ICP- optical emission spectrometry	Radiation pagers	Stereo Microscope
Automatic hydraulic press machine	Energy-dispersive X-ray spectroscopy	Image Analyzer	Radseeker	Tensile Tester
Carbon-Sulfur Analyzer	Enzyme-linked immunosorbent assay (ELISA) kits	Ion mobility spectrometry	Radio isolation chamber	Thermocycler
Liquid handling system	Fourier-Transform Infrared spectroscopy	IR Microscope	Refractometer	Thermogravametric analyzer
Cyvac (cyanoacrylate fuming chamber)	Gas chromatography mass spectrometry	Liquid chromatography–mass spectrometry	RMX Handheld Raman	Titrimeter
Direct analysis in real time (DART) MS	GC/MS Q-TOF (Time of Flight)	Forensic duplicator	Rockwell hardness and microhardness	UV-Vis
Diffuse Brightness Meter	GC-Flame ionization detector	Nitrogen Analyzer	Vehicle mounted Gamma Spectrometers	Dosimeters
Digital Microscope	GC-IR Spectrometry	High-Purity Ge Detector	Saccharimeter	X-ray Diffraction
Directional Brightness Meter	Hazmat 360 FT-IR	Polarimeter	Scanning electron microscope	X-ray Fluorescence
	High Performance Liquid Chromatography (HPLC)	Polarized Microscope	Soxhlet extractor	



So What? Who Cares?

- Problems needing solutions
 - *Detecting and identifying controlled substances, synthetics, and analogues*
 - *Rapid and Accurate Screening – presumptive analysis*
 - *Rapid and Accurate Identification – confirmatory analysis*
 - *International Mail screening*
 - *Screening suspicious packages for analysis*
 - *Trade commodities origin, characterization, and composition*
 - *Country of Origin*
 - *Remote and satellite laboratory operations*
 - *Construct full forensics lab in/at a...*
 - *Warehouse*
 - *Van*
 - *Remote location*
 - *Wherever we want*





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