

CCS Web-Based Systems

NONMUNITION

1. • GC-DDS (“green” chemical)
2. • GP-CAS (“green” product)
3. • G-PACS (“green” process)
4. • G-WACS (“green” waste)
5. C2D (data/CAS #)
6. Regulatory Queries
7. Chem-NET (regulatory list QC)
8. MISS (MSDS Creation)
9. • MRS-PHI (MSDS-product)
10. • MRS-CHI (MSDS-chemical)
11. • MRS-CEPPA (MSDS-“green”)
12. MIE-CPRS (export-import)
13. • COC (chemicals of concern)
14. • C-CAS (chemical tracking)
15. • CHEMS (hazard & equivalent material)

16. • G-PEAS (“green” process engineering) [*pending*]
17. C-HoSS (homeland security) [*concept*]
18. BBP-CAS (biobased) [*concept*]

• Utilizes our 44 ecological, health & safety “green” endpoint criteria

MUNITION

1. MACS-1 (demil)
2. MACS-2 (ranges)
3. MACS-3 (theoretical compliance)
4. • G-MACS (“green”)
5. • GM-PACS (“green” process)
6. • GM-WACS (“green” waste)
7. INC-FRCS (incinerator)
8. RISK (emission dispersion)
9. TRACS (hazardous waste)
10. • MACS-COC (constituents of concern)
11. MACS-PRA (permit repository)
12. MACS-ERA (emissions risk assessment)
13. MACS-HRA (health risk assessment)
14. MACS-EnRA (environmental risk assessment)
15. MACS-OBODM (plume height)
16. MACS-AERMOD (air dispersion & deposition)
17. MACS-MODFLOW (groundwater dispersion)
18. MACS-GIS (site pollutant impact)

19. • GM-PEAS (DfD “green” process engineering) [*pending*]

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CCS Nonmunition Web-Based Systems ^a

All CCS nonmunition Web-based systems utilize information from our centralized Relational Chemical and Product Database (R-CPD). R-CPD is the largest and most accurate hazardous material repository in the world. R-CPD is estimated to include over 75 million data elements for more than 275,000 chemicals, over 1 million chemical and munition products, and 700 regulatory lists (local, state, federal, international, and nongovernmental organization [NGO-i.e., ACGIH]). CCS started compiling and purifying this data in 1985 and currently draws data from over 1,000 public sources and incorporates numerous data elements of our own invention/calculation. R-CPD is currently composed of more than 250 fields for each chemical, as data is available, and new fields are added each month, to fulfill customer requests.

◆ Modules currently available on the World Wide Web

● Modules currently with submitted proposals

✂ Modules in the defined concept stage

1. ◆ GC-DDS: "Green" Chemical Data Delivery System GC-DDS is a Web-based system that utilizes 45 ecological, health and safety endpoint criteria to quantitatively and objectively evaluate the "greenness" of individual chemicals and/or alternatives for the intended chemical application (i.e., solvent, acid, base, oxidizer, etc.). GC-DDS provides the supportive data for the "green" ratings and for evaluating alternative chemicals.

2. ◆ GP-CAS: "Green" Products Compliance Analytical System GP-CAS is a Web-based system that utilizes 45 ecological, health and safety endpoint criteria to quantitatively and objectively evaluate the "greenness" of products during their design and transportation/usage/storage, the first and third stages of the product life cycle. GP-CAS, in combination with G-PACS (see #3), and G-WACS (see #4), evaluates the "greenness" of all four stages of the product life cycle. GP-CAS also utilizes 112 state, federal and international lists to assess the regulatory impact of each product constituent, and identifies alternative constituents for those that are the least "green," or have the worst regulatory impact.

3. ◆ G-PACS: "Green" Process Analytical Compliance System G-PACS is a Web-based system that utilizes 45 ecological, health and safety endpoint criteria to quantitatively and objectively evaluate the "greenness" of processes during the manufacture of a product, the second stage of the product life cycle. G-PACS, in combination with GP-CAS (see #2), and G-WACS (see #4), evaluates the "greenness" of all four stages of the product life cycle. G-PACS also utilizes 112 state, federal and international lists to assess the regulatory impact of each process, and identifies alternative constituents for those that are the least "green," or have the worst regulatory impact.

4. ◆ G-WACS: "Green" Waste Analytical Compliance System G-WACS is a Web-based system that utilizes 50 ecological, health and safety endpoint criteria to quantitatively and objectively evaluate the "greenness" of chemical wastestreams from product manufacture and/or disposal, the fourth stage of the product life cycle. G-WACS, in combination with GP-CAS and G-PACS (see #2 & #3), evaluates the "greenness" of all four stages of the product life cycle. G-WACS also utilizes 112 state, federal and international lists to assess the regulatory impact of each wastestream.

5. ◆ C2D: Chemical Classification Data C2D is a Web-based system that provides a broad spectrum of reference data for a specific chemical. Data elements that can be selected include: synonyms and ecological, health, safety, or physical/chemical values. C2D also provides regulatory impacts for 112 state, federal and international lists and DOT Safety Sheets.

6. ◆ Regulatory Queries This Web-based system enables a user to enter a chemical name or CAS number and determine whether the chemical is impacted by any of the 700 local, state, federal, international, or nongovernmental organization regulatory lists.

7. ◆ Chem-NET: Chemical Nomenclature Evaluation Tool Chem-NET is a Web-based system that provides access to our Chemical Cross Reference Dictionary composed of more than 550,000 synonyms and numeric chemical identifiers for over 275,000 chemical and munition products. Chem-NET allows regulatory agencies and Material Safety Data Sheet developers to accurately identify their constituent chemicals.

8. ◆ MISS: MSDS Information Synthesis System MISS is a Web-based system that facilitates the creation of a new product MSDS. The user enters raw material MSDS and other data that is then merged with MISS chemical reference, regulatory and R/S-statement databases to create an MSDS. MSDSs in the system can easily be updated, electronically transferred to any of our three MSDS retrieval systems (see #9, #10 and #11) or printed as a hardcopy at any location with customer-specific MISS approved access codes/passwords.

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^a Except where otherwise noted

9. ♦ **MRS–PHI: MSDS Retrieval System for Product Hazard Information**

MRS–PHI is a Web-based capability that either makes imaged manufacturer MSDSs electronically available to their customers, or employers' MSDSs available to their employees. MRS–PHI can receive electronic MSDSs from MISS (see #8) or from manufacturer files.

10. ♦ **MRS–CHI: MSDS Retrieval System for Chemical Hazard Information**

MRS–CHI is a Web-based capability that not only provides product MSDS images (as in MRS–PHI) but also provides an MSDS for each product constituent chemical, four chemical reference files (i.e., synonyms, physical/chemical properties, formulas, and DOT Guides), and an expanded index and search engine.

11. ♦ **MRS–CEPPA: MSDS Retrieval System for Chemical and Environmentally Preferable Product Analyses**

MRS–CEPPA is a Web-based system that includes the capabilities of MRS–PHI and MRS–CHI, but also includes 112 of the most critical state/federal/international regulatory lists (from #1-4), "green" ratings based upon 45 ecological/health/safety endpoint criteria, a compendium of chemical replacement alternatives for solvents (i.e., alcohols, VOCs, and SVOCs), acids (i.e., organic and inorganic), bases, oxidizers, chelators, surfactants, metals and their compounds, alloys (i.e., steel, brass, aluminum, etc.), and a comprehensive analytical capability.

12. ♦ **MIE–CPRS: Manufacture Import Export Chemical Product Regulatory System**

MIE–CPRS is a Web-based capability that enables an organization to identify import and/or export requirements for a chemical product. MIE–CPRS also identifies regulatory constraints for the product or manufacturing process, provides required notification forms, and chemical/chemical constituent hazard data. MIE–CPRS has also integrated the "green" analytical capabilities (see #1-4).

13. ♦ COC: Chemicals of Concern The Web-based COC module integrates five standardized, objective and quantitative criteria, including the ecological/health/safety criteria (from #1-4), to rank/prioritize pure or product constituent COCs. This automated, Web-based module ranks COCs on the basis of quantities processed, regulatory, ecological, health and safety impacts, overall "concerns," and identifies the Level of Concern (LOC) for each COC. This module is equivalent to the MACS–COC module (see CCS Web-Based Systems -Munition) that has been utilized to assess COCs on ranges and at demil sites.

14. ♦ C–CAS: Chemical Compliance Analytical System This state-of-the-art Web-based chemical/product container tracking system is based upon individual container bar codes that can be captured manually with a scanner, or utilizing automated scales and scanners. C–CAS captures over 20 potential data elements for each container, adds a dozen product data elements, and maintains this real time data in the C–CAS Master Product Inventory File. In addition, C–CAS identifies each product constituent chemical and maintains a real time Master Chemical Reference file, derived from our separate

Relational Chemical and Product Database (R–CPD), that includes customer-specific regulatory impact List of Lists, ecological, health, safety, physical/chemical, hazard classification, handling, and generic dictionary data elements. C–CAS can generate container bar code labels and literally hundreds of analytical compliance reports. C–CAS container bar codes can flow directly into a waste module. Finally, C–CAS was the software template for our MACS–1 module (see #1, under CCS Web-based Systems–Munition) and can also serve as the software template for over a dozen identified, customer-specific modules (e.g., Industrial Hygiene, Air Toxics, Storage Tanks, Solid Waste, etc.).

15. ♦ **CHEMS: Chemical Hazard and Equivalent Material System**

CHEMS is a Web-based capability that functions either as a standalone analytical system, or as an enhancement within GP–CAS (see #2), G–PACS (see #3) or MRS–CEPPA (see #11). CHEMS identifies alternative chemicals within generic classes (i.e., solvents [alcohols, VOCs, SVOCs], acids [organic and inorganic], bases, oxidizers, chelators, surfactants, metals and their compounds, and alloys [steel, brass, aluminum]), etc., and provides appropriate ranking/assessment data (e.g., redox potential for oxidizers, pKa values for acids, etc.), and "green" scores for all chemicals within the selected class.

16. ● **G–PEAS: "Green" Process Engineering Compliance Analytical System**

G–PEAS quantitates and normalizes the five green engineering factors stipulated in the ANSI/GCI 355 Greener Chemicals and Processes Information standard on the same 0-100% scale as our other green modules. This enables G–PEAS to quantitatively integrate process chemical utilization efficiency, water usage, energy consumption, biobased carbon content, and process safety, with ecological, health and chemical safety across the entire life cycle of a chemical product.

17. ✕ C–HoSS: Chemical Homeland Security System C–HoSS utilizes existing chemical/product inventory data and unique, quantitative chemical hazard ranking and grading criteria to rank resident chemical hazards, security risks, and mortality risks to identify three different types of inventory concerns. Addition of high risk container accessibility constraints enables C–HoSS to rank container vulnerabilities and identify container accessibility constraints that eliminate any/all vulnerabilities. Thus, C–HoSS assures that vulnerabilities to terrorist utilization of chemical inventories to create weapons of mass destruction are effectively controlled and eliminated.

18. ✕ **BBP–CAS: Biobased Products Compliance Analytical System**

BBP–CAS is a Web-based system that integrates the 45 endpoint "green" criteria (see #1-4) with similarly normalized biomass, regulatory impact and economic performance scores. Thus, BBP–CAS similarly provides a quantitative and objective evaluation of the biobased value of a product that can be quantitatively and objectively compared to a similarly functioning product. BBP–CAS can also be combined with G–PACS (see #3) and G–WACS (see #4) to provide a life cycle assessment.

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