

| HAZARD RATING | |
|----------------|------|
| HEALTH | 3 |
| FLAMMABILITY | 1 |
| REACTIVITY | 2 |
| SPECIAL NOTICE | Acid |



TELEDYNE BATTERY PRODUCTS MATERIAL SAFETY DATA SHEET LEAD-ACID NONSPILLABLE BATTERY

| SECTION 1: CHEMICAL PRODUCT & COMPANY INFORMATION | |
|---|--|
| MANUFACTURER'S NAME: | TELEDYNE BATTERY PRODUCTS |
| ADDRESS: | 840 WEST BROCKTON AVENUE, REDLANDS, CA 92374 |
| TELEPHONE: | 909-793-3131 |
| 24-HOUR EMERGENCY CONTACT: | INFOTRAC 1-800-535-5053, CUSTOMER ID: 78604 |
| PRODUCT NAME: | LEAD ACID, NONSPILLABLE BATTERY |
| TRADE NAME: | TELEDYNE BATTERY, GILL AIRCRAFT BATTERY, CENTURION AND SILTRON |
| SYNONYMS: | 12B90R, 690R, 691R, G-25S, G-30S, G-35S, G-6381ES, G-639ES, G641S, G242S, G243S, G230S, G250S |
| CHEMICAL FAMILY: | LEAD AND LEAD COMPONENTS |
| FORMULA: | NOT APPLICABLE |
| INTENDED USE: | VALVE REGULATED/LEAD-ACID BATTERIES FOR AIRCRAFT, EMERGENCY LIGHTING, GROUND SUPPORT, ENGINE STARTING EQUIPMENT AND CABLE TV/TELECOMMUNICATIONS. |

| SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS | | | | | |
|---|-----------|----------|------------------------|------------------------|----------------------|
| MATERIAL OR COMPONENT | CAS # | WEIGHT % | OSHA PEL | ACGIH TLV | OSHA ACTION LEVEL |
| LEAD AND LEAD COMPOUNDS | 7439-92-1 | <95 | 50 µg/m ³ | 0.15 mg/m ³ | 30 µg/m ³ |
| ANTIMONY | 7440-36-0 | <1.1 | 0.5 mg/m ³ | 0.5 mg/m ³ | Not Applicable |
| ARSENIC | 7440-38-2 | <0.1 | 10 µg/m ³ | 0.2 mg/m ³ | 5 µg/m ³ |
| BARIUM SULFATE | 7727-43-7 | <0.2 | 5 mg/m ³ ** | 10 mg/m ³ | Not Applicable |
| CALCIUM COMPOUNDS | 7440-70-2 | <0.1 | 5 mg/m ³ * | 2 mg/m ³ * | Not Applicable |
| CARBON BLACK EXTRACTS | 1333-86-4 | <0.1 | 3.5 mg/m ³ | 3.5 mg/m ³ | Not Applicable |
| MAGNESIUM SULFATE | 7487-88-9 | <0.3 | N/A | N/A | Not Applicable |
| NICKEL SULFATE | 7786-81-4 | <0.1 | 0.1 mg/m ³ | 0.1 mg/m ³ | Not Applicable |
| SODIUM SULFATE | 7757-82-6 | <0.3 | 10 mg/m ³ ^ | 10 mg/m ³ ^ | Not Applicable |
| SELENIUM | 7782-49-2 | <0.1 | 0.2 mg/m ³ | 0.2 mg/m ³ | Not Applicable |
| SULFURIC ACID (ELECTROLYTE) | 7664-93-9 | <22 | 1 mg/m ³ | 1 mg/m ³ | Not Applicable |
| TIN COMPOUNDS | 7440-31-5 | <0.3 | 2 mg/m ³ | 2 mg/m ³ | Not Applicable |

* As CaO

** Respirable

^ Total nuisance dust

SECTION 3: HAZARD IDENTIFICATION

ROUTES OF EXPOSURE

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| INHALATION | INHALATION OF ELECTROLYTE CAN CAUSE BURNS IN THE UPPER RESPIRATORY TRACT. LUNG IRRITATION AND PULMONARY EDEMA MAY OCCUR. LEAD DUST, VAPOR OR FUME MAY BE ABSORBED BY THE RESPIRATORY SYSTEM AND CAN RESULT IN BOTH ACUTE AND CHRONIC OVEREXPOSURE AS WELL AS RESPIRATORY IRRITATION. |
| SKIN CONTACT | ELECTROLYTE MAY CAUSE BURNS OR LOCALIZED IRRITATION. LEAD IS NOT READILY ABSORBED THROUGH THE SKIN. |
| EYE CONTACT | ELECTROLYTE MAY CAUSE IRRITATION, CORNEAL BURNS AND CONJUNCTIVITIS. BLINDNESS OR SEVERE OR PERMANENT INJURY MAY RESULT. LEAD DUST, VAPOR OR FUME MAY CAUSE IRRITATION. |
| INGESTION | ELECTROLYTE MAY CAUSE BURNS TO THE MOUTH, ESOPHAGUS AND STOMACH. LEAD DUST, VAPOR OR FUME MAY BE ABSORBED THROUGH THE DIGESTIVE SYSTEM AND CAN RESULT IN BOTH ACUTE AND CHRONIC OVEREXPOSURE. |

| CARCINOGENICITY | IARC | NTP | OSHA |
|-----------------|------|-----|------|
| LEAD | X | | X |
| SULFURIC ACID | X | | X |
| ARSENIC | X | X | X |

SECTION 4: FIRST AID MEASURES

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| EYES | (DRY OXIDE OR ACID) WASH IMMEDIATELY WITH LARGE AMOUNTS OF WATER, LIFTING THE LOWER AND UPPER LIDS CONTINUOUSLY. GET MEDICAL ATTENTION. |
| SKIN | NOT A DIRECT ROUTE OF ENTRY FOR LEAD AND LEAD COMPOUNDS. FOR ACID EXPOSURE, IMMEDIATELY FLUSH THE EXPOSED AREA OF THE SKIN WITH LARGE AMOUNTS OF WATER. REMOVE ANY CONTAMINATED CLOTHING AND SHOES (THIS CAN BE DONE WHILE UNDER SHOWER). GET MEDICAL ATTENTION FOR ACID EXPOSURE. |
| INHALATION | FOR LEAD AND LEAD COMPOUNDS EXPOSURE, REMOVE EMPLOYEE FROM AREA OF EXPOSURE AND GET MEDICAL ATTENTION. FOR ACID EXPOSURE, REMOVE EMPLOYEE TO FRESH AIR. IF PERSON IS NOT BREATHING AND HAS NO PULSE, PERFORM CPR. KEEP VICTIM WARM AND AT REST. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET IMMEDIATE MEDICAL ATTENTION. |
| INGESTION | FOR LEAD EXPOSURE, GET MEDICAL ATTENTION. FOR SULFURIC ACID, GIVE EMPLOYEE LARGE AMOUNTS OF WATER IF CONSCIOUS. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION. FOR LEAD, GET IMMEDIATE MEDICAL ATTENTION. |

SECTION 5: FIRE FIGHTING MEASURES

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| FLASH POINT | N/A FOR LEAD | 675 °F FOR POLYPROPYLENE CASE |
| AUTO IGNITION TEMPERATURE | N/A | |
| FLAMMABLE LIMITS IN AIR (% BY VOL) | N/A | |
| EXTINGUISHING MEDIA | USE HALON, DRY CHEMICAL EXTINGUISHER. BATTERY CASE WILL BURN. | |
| SPECIAL FIRE FIGHTING PROCEDURES | USE OF WATER IN EXTINGUISHING BURNING BATTERIES MAY CAUSE SPLATTERING DUE TO THE PRESENCE OF MOLTEN LEAD. | |
| UNUSUAL FIRE AND EXPLOSION HAZARD | WHILE BATTERY IS BEING CHARGED, HYDROGEN GAS IS PRODUCED. BATTERY MAY EXPLODE IF HYDROGEN GAS IS TRAPPED INSIDE THE BATTERY CASE. KEEP IGNITION SOURCES AWAY. | |

SECTION 6: ACCIDENTAL RELEASE MEASURES

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| SPIILLED OR RELEASED | SHOULD A BATTERY BREAK OPEN, ISOLATE THE AREA. PICK UP AND CONTAINERIZE ALL BATTERY PARTS AND MATERIALS. LIMIT PERSONAL EXPOSURE WITH GLOVES, EYE AND FACE PROTECTION. ELECTROLYTE SHOULD BE ABSORBED WITH A NON-ORGANIC TYPE ABSORBENT SUCH AS DRY SAND OR EARTH. AVOID DILUTION WITH WATER. LEAD SPILLED FROM THE BATTERY SHOULD BE HEPA VACUUMED OR WET MOPPED, DO NOT DRY SWEEP OR USE COMPRESSED AIR. |
| NEUTRALIZING CHEMICALS | USE SODA ASH OR BAKING SODA TO NEUTRALIZE THE ELECTROLYTE. |

SECTION 7: HANDLING AND STORAGE

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| HANDLING AND STORAGE | EXERCISE CAUTION IN HANDLING AND STORAGE DUE TO WEIGHT OF UNITS. |
| OTHER PRECAUTIONS | DO NOT ALLOW METAL OR OTHER CONDUCTIVE MATERIAL TO SHORT CIRCUIT TERMINALS. HEAT, SPARK, DAMAGE TO ELECTRICAL CIRCUITS, AND FIRE MAY RESULT FROM SHORT CIRCUITING. PRACTICE GOOD HYGIENE TO MINIMIZE PERSONAL EXPOSURE. BATTERY MAY RELEASE HYDROGEN DURING CHARGING OR IF EXPOSED TO HIGH TEMPERATURES. DO NOT STORE IN AIR TIGHT CONTAINER. |
| VENTILATION REQUIREMENTS | BATTERY CHARGING AREAS MUST BE ADEQUATELY VENTILATED TO PREVENT HAZARDOUS CONCENTRATIONS OF FLAMMABLE GAS OR ACID MIST. DESIGN CRITERIA FOR VENTILATION SYSTEMS ARE CONTAINED IN THE INDUSTRIAL VENTILATION MANUAL PUBLISHED BY THE ACGIH. |

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

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| RESPIRATORY | UNDER NORMAL CONDITIONS OF USE RESPIRATORY PROTECTION IS NOT REQUIRED. HOWEVER, SHOULD CONDITIONS ARISE WHERE RESPIRATORS ARE NEEDED, USE ONLY NIOSH/MSHA RESPIRATORS APPROVED FOR DUST, FUME AND MIST. |
| EYE | CHEMICAL GOGGLES, FULL FACE SHIELD. |
| SKIN | GLOVES APPROVED FOR SULFURIC ACID. |
| OTHER | ACID RESISTANT APRON. |

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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| BOILING POINT | LEAD | 3164 °F (1740 °C) @ 760 mm Hg |
| | ELECTROLYTE | 203 °F (95 °C) |
| MELTING POINT | LEAD | 621 °F (327.43 °C) |
| | ELECTROLYTE | N/A |
| | POLYPROPYLENE | 320 °F (160 °C) |
| SPECIFIC GRAVITY | LEAD | 11.34 |
| | ELECTROLYTE | 1.285 |
| VAPOR PRESSURE | LEAD | NEGLIGIBLE |
| | ELECTROLYTE | 10 @ 18 °F |
| VAPOR DENSITY | LEAD | N/A |
| | ELECTROLYTE | >1 |
| SOLUBILITY | LEAD | INSOLUBLE IN WATER |
| | ELECTROLYTE | 100% |
| % VOLATILES BY VOL | LEAD AND ELECTROLYTE | NEGLIGIBLE |
| %EVAPORATION RATE | LEAD | N/A |
| | ELECTROLYTE | <1 |
| APPEARANCE AND ODOR | NO ODOR. BATTERY CASE IS PINK, CREAM, CLEAR, OFF-WHITE, OR BLACK. ELECTROLYTE IS A CLEAR AND ODORLESS LIQUID. | |

SECTION 10: STABILITY AND REACTIVITY

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| CONDITIONS CONTRIBUTING TO INSTABILITY | NONE |
| INCOMPATIBILITY | CONTACT OF ELECTROLYTE WITH ORGANIC MATERIAL. ALSO CONTACT OF LEAD WITH STRONG OXIDIZERS MAY LIBERATE HYDROGEN GAS. |
| HAZARDOUS DECOMPOSITION PRODUCTS | SULFURIC ACID MIST, SULFUR DIOXIDE AND CARBON MONOXIDE MAY BE RELEASED WHEN ELECTROLYTE DECOMPOSES. NO DECOMPOSITION FOR LEAD AND LEAD COMPOUNDS. |
| CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION | WILL NOT OCCUR |

SECTION 11: TOXICOLOGICAL INFORMATION

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| ACUTE OVEREXPOSURE | SULFURIC ACID MAY CAUSE IRRITATION TO THE EYES, NOSE AND THROAT. DIFFICULTY IN BREATHING MAY BE EXPERIENCED. ACID SPLASHED IN THE EYES OR ON THE SKIN MAY CAUSE BURNS OR IRRITATION. ACUTE UNTREATED OVEREXPOSURE TO LEAD MAY LEAD TO WEAKNESS, VOMITING, LOSS OF APPETITE, UN-COORDINATED BODY MOVEMENTS, CONVULSIONS, STUPOR AND POSSIBLY COMA. |
| CHRONIC OVEREXPOSURE | REPEATED PROLONGED EXPOSURE TO DILUTE SULFURIC ACID MAY CAUSE IRRITATION OF THE SKIN. REPEATED OR PROLONGED EXPOSURE TO MIST OR VAPORS OF SULFURIC ACID MAY CAUSE EROSION OF THE TEETH, CHRONIC IRRITATION OF THE EYES OR CHRONIC INFLAMMATION TO THE NOSE, THROAT AND BRONCHIAL TUBES. UNDER NORMAL CONDITIONS OF USE, EXPOSURE TO LEAD OR LEAD CONTAINING COMPOUNDS DOES NOT OCCUR. CHRONIC UNTREATED EXPOSURE TO LEAD MAY CAUSE WEAKNESS, INSOMNIA, HYPERTENSION, SLIGHT IRRITATION TO SKIN AND EYES, METALLIC TASTE IN MOUTH, ANEMIA, CONSTIPATION, HEADACHE, MUSCLE AND JOINT PAINS, NEUROMUSCULAR DYSFUNCTION, POSSIBLE PARALYSIS, ENCEPHALOPATHY AND PNEUMOCONIOSIS. LEAD EXPOSURE CAN POSE RISK TO DEVELOPING FETUSES AND MAY ALSO IMPAIR THE REPRODUCTIVE SYSTEMS IN BOTH MEN AND WOMEN. DAMAGE TO THE KIDNEYS, HEMATOPOIETIC AND/OR CENTRAL NERVOUS SYSTEM MAY OCCUR. |

SECTION 12: ECOLOGICAL INFORMATION

LEAD IS PERSISTENT IN THE ENVIRONMENT AND ACCUMULATES IN SOILS AND SEDIMENTS THROUGH DEPOSITION FROM AIR SOURCES, DIRECT DISCHARGE OF WASTE STREAMS TO WATER BODIES, MINING, AND EROSION. ECOSYSTEMS NEAR POINT SOURCES OF LEAD DEMONSTRATE A WIDE RANGE OF ADVERSE EFFECTS INCLUDING LOSSES IN BIODIVERSITY, CHANGES IN COMMUNITY COMPOSITION, DECREASED GROWTH AND REPRODUCTIVE RATES IN PLANTS AND ANIMALS, AND NEUROLOGICAL EFFECTS IN VERTEBRATES.

SECTION 13: DISPOSAL CONSIDERATION

BATTERY PARTS MAY BE RECYCLED BY AN EPA-PERMITTED SECONDARY LEAD SMELTING FACILITY OR DISPOSED OF AS HAZARDOUS WASTE PURSUANT TO RCRA REQUIREMENTS. ELECTROLYTE SHOULD BE HAULED TO A PERMITTED TREATMENT FACILITY. CONTACT LOCAL AND/OR STATE ENVIRONMENTAL OFFICIALS REGARDING DISPOSAL INFORMATION. DISPOSE OF HAZARDOUS WASTE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

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| US DOT DESCRIPTION FOR GROUND TRANSPORT: | NONSPILLABLE BATTERY THE DEPARTMENT OF TRANSPORTATION REQUIREMENTS ARE CONTAINED IN TITLE 49 OF THE CODE OF FEDERAL REGULATIONS, CHAPTER 1, SUBCHAPTER C, PARTS 106 THROUGH 180. THE BATTERIES ARE EXCEPTED FROM ALL OTHER REQUIREMENTS OF SUBCHAPTER C (SHIPPING PAPERS; MARKING; LABELING; AND PLACCARDING) AS THEY MEET THE REQUIREMENTS OF 49 CFR 173.159 (d)(1-3)(I-ii) AS ALLOWED FOR ' BATTERIES, WET, NONSPILLABLE ' IN 49 CFR 172.101. 49 CFR 173.159 (d) STATES (1) THE BATTERY MUST BE PROTECTED AGAINST SHORT CIRCUITS AND SECURELY PACKAGED. (2) THE BATTERY AND OUTER PACKAGING MUST BE PLAINLY AND DURABLY MARKED ' NONSPILLABLE OR NONSPILLABLE BATTERY ', AND (3) THE BATTERY MUST BE CAPABLE OF WITHSTANDING THE VIBRATION AND PRESSURE DIFFERENTIAL TEST AS REQUIRED IN 49 CFR 173.159 (d)(3). OUTSIDE INDEPENDENT CERTIFIED TEST REPORTS ARE ON FILE AT TELEDYNE BATTERY PRODUCTS. |
| IATA / ICAO: | THIS NOTICE IS TO CLARIFY TO SHIPPERS AND TRANSPORTERS THAT BATTERIES MARKED ' NONSPILLABLE OR NONSPILLABLE BATTERY ' ARE PACKED AND MARKED IN ACCORDANCE TO 49 CFR 173.159 (d)(2) AND ARE DETERMINED TO BE IN COMPLIANCE WITH THE INTERNATIONAL CIVIL AERONAUTICS ORGANIZATION (ICAO) AND THE INTERNATIONAL AIR TRANSPORTATION ASSOCIATION (IATA), IN ACCORDANCE WITH A67 "NOT RESTRICTED", PACKING INSTRUCTIONS 806 . THEREFORE, THESE BATTERIES ARE NOT RESTRICTED FOR SHIPMENT BY AIR OR ANY OTHER MEANS OF TRANSPORTATION. |

SECTION 15: REGULATORY INFORMATION

PROPOSITION 65 WARNING

BATTERY POSTS, TERMINALS AND RELATED ACCESSORIES CONTAIN LEAD AND LEAD COMPOUNDS, CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND REPRODUCTIVE HARM. **WASH HANDS AFTER HANDLING.**

SARA TITLE III

THE CHEMICALS LISTED BELOW ARE TOXIC CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

THIS LEAD-ACID BATTERY IS CLASSIFIED AS A MANUFACTURED ARTICLE (40 CFR 372.3) AND THE HAZARDOUS MATERIALS (LEAD, ANTIMONY, ARSENIC AND NICKEL COMPOUNDS) CONTAINED WITHIN ARE NOT RELEASED UNDER NORMAL CONDITIONS OF USE. SINCE THESE CHEMICALS ARE NOT RELEASED DURING NORMAL USE THEY ARE EXEMPT FROM THE REPORTING REQUIREMENTS CONTAINED IN 40 CFR PART 372 SUBPART B. HOWEVER, SULFURIC ACID MAY BE RELEASED INTO THE ENVIRONMENT IF A BATTERY BREAKS AND THEREFORE MAY NOT BE EXEMPT FROM THE REPORTING REQUIREMENTS OF SARA TITLE III. SEE EXEMPTIONS, 40 CFR 372.38 (b).

SECTION 16: OTHER INFORMATION

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY TO VENDEE OR THIRD PERSON PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED. FURTHERMORE, VENDEE ASSUMES THE RISK IN THIS USE OF THE MATERIAL.

TBP NOTIFICATION

THIS PRODUCT DOES NOT CONTAIN THE ELEMENT MERCURY. THIS IS A **MERCURY-FREE PRODUCT**.

PRECAUTIONARY STATEMENTS

SHOULD A BATTERY BREAK OPEN AND A LEAD SPILL OCCURS, PRECAUTIONS SHOULD BE TAKEN TO PREVENT LEAD DUST FROM BECOMING AIR BORNE. INDIVIDUALS SHOULD WEAR RESPIRATORY PROTECTION, PROTECTIVE CLOTHING, RUBBER GLOVES AND EYE PROTECTION IF CONDUCTING A LEAD SPILL CLEAN-UP.

AVOID THE USE OF NON-INSULATED TOOLS. IF THEY ARE REQUIRED, TAKE CARE NOT TO MAKE A CONNECTION BETWEEN THE TWO BATTERY TERMINALS AS SEVERE SPARKING MAY OCCUR WHICH COULD RESULT IN AN EXPLOSION. RINGS, METAL WATCH BANDS, NECKLACES AND OTHER JEWELRY SHOULD BE REMOVED WHILE SERVICING BATTERIES.

SUFFICIENT VENTILATION SHOULD BE PROVIDED IN ALL WORK AREAS TO PREVENT A BUILD UP OF DANGEROUS GASES. IF THE BATTERY ROOM IS AIR CONDITIONED AS PART OF AN OVERALL BUILDING SYSTEM, THE EXHAUST AIR FROM THE BATTERY ROOM SHOULD NOT BE RETURNED TO THE AIR DISTRIBUTION SYSTEM. THE ROOM SHOULD HAVE ITS OWN EXHAUST SYSTEM CONNECTED DIRECTLY TO OUTSIDE AIR. HYDROGEN AND OXYGEN GASES ARE PRODUCED DURING NORMAL BATTERY OPERATION, ESPECIALLY DURING CHARGING. HYDROGEN GAS IS LIGHTER THAN AIR, COLORLESS, ODORLESS AND TASTELESS, THEREFORE IT IS DIFFICULT TO DETECT WITHOUT SPECIAL EQUIPMENT. ALWAYS ASSUME THAT SMALL AMOUNTS OF GASES ARE PRESENT AND TAKE ALL NECESSARY PRECAUTIONS.

THIS INFORMATION SHOULD BE INCLUDED IN ALL MSDS' THAT ARE COPIED AND DISTRIBUTED FOR THIS MATERIAL.

UPDATED BY: JESUS BUENO LUNA, ENVIRONMENTAL / HEALTH AND SAFETY SPECIALIST
AUGUST 2013