



DESIGN LIBRARY SPECIAL COLLECTIONS

2nd INTERNATIONAL THERMIONIC CONFERENCE (STRESA) COLLECTION

Collection #: MS MSS 6

Location: STORAGEARCH SPECIAL

Papers: 1968

No. of Items: 1 box, 1 cubic ft.

Background

During the period May 27-31, 1968 the Second International Conference on Thermionic Electrical Power Generation met in Stresa, Italy. A thermion is an electrically charged particle emitted by an incandescent substance; hence thermionics is a branch of physics dealing with such phenomena. The conference in Stresa attracted a great number of scientists from around the world, many of whom prepared papers on their research in the field. The papers were collected by Samuel Rousso, Assistant Atomic Energy Scientific Representative at the American Embassy in Paris, France.

Scope and Content Note

This collection of papers submitted for presentation at the Stresa conference consists of a single series, Reports. Within that series are 11 different subseries that, with the exception of 11) Miscellany, reflect original

categories of arrangement by Samuel Rousso. Within each subseries individual folders contain the reports/papers addressing various aspects of thermionic energy research.

Subseries within the collection include: 1) Converter Performance, 2) Integrated Systems, 3) In-pile Testing, 4) Heat Pipe Systems, 5) Materials, 6) Converter and System Design Analysis, 7) Ignited Mode Diode, 8) Converter Performance Analysis, 9) Plasma Properties, 10) Surface Phenomena and 11) Miscellany. Reports found within the collection are written in both English and French.

Container List

Box 1

Series 1 Reports, 1968

Subseries 1 Converter Performance

Folder 1 Characteristics of a Thermionic Converter with a Chloride Vapor Deposited Tungsten Emitter and a Nickel Collector

Folder 2 Essais D'Un Convertisseur Du Type Nucleaire Muni D'Un Reservoir De Cesium A Adsorption

Folder 3 L'Examen Des Couches Refractaires Pyrolytiques Au Moyen Du Microscope Electronique Secondaire a Balayage

Folder 4 Thermionic Converter Technology

Folder 5 Some problems of Solar Energy Thermionic Converters

Folder 6 High Pressure Caesium Thermionic Converter With a Cold Region

Folder 7 Convertisseur Thermonique Chauffe Par Flamme

Folder 8 Arc-Mode Thermionic Converter Performance: Measurements and Interpretation

Folder 9 Technologie Des Convertisseurs Thermioniques Plans Et Cylindriques

Folder 10 Investigation on Combined Operation of Thermionic and Thermoelectric Converters

Folder 11 Investigation of a Ne-A Thermionic Converter

Subseries 2 Integrated Systems (Reactor and Isotopic)

Folder 1 The Incore Thermionic Reactor as a Space Power Source

Folder 2 Results of Studies on Various Fast and Thermal Thermionic Reactor Systems

Folder 3 In-Reactor Thermionic Converter Testing Experience at General Electric

Folder 4 Thermionic Electric Propulsion System Characteristics and Capabilities

Folder 5 Thermionic Reactors for Electric Propulsion-Parametric Studies

Folder 6 External Fuel Thermionic Reactors

Folder 7 Uninsulated In-core Thermionic Diode Concept

Folder 8 A Heat Pipe Thermionic Reactor Concept

Folder 9 Out-of Core Thermionic Space Power

Folder 10 Stability and Control Considerations for Thermionic Reactors

Folder 11 SNAP-13 Generator Development Program

Folder 12 Design and Characteristics of an Actinium Fueled Thermionic Generator

Folder 13 A Miniature Atomic Battery Based on Thermionic Conversion

Folder 14 Thermionic Electrical Power Generation From Reentry Plasmas

Subseries 3 In-Pile Testing

Folder 1 Converter SD-4 Design and Summary of Test Results

Folder 2 Long Term Operations of In-Pile and Out-of Pile Thermionic Converters

Folder 3 Retention of Fission Gases in the UO₂ Phase of Mo UO₂ Cermets Irradiated at High Temperatures

Folder 4 Experiences De Conversion Thermo-ioni que "Sirene" En Pile et Examens Apres Irradiation Du Convertisseur "Sirene 302"

Folder 5 Laboratory Life Test and In-Pile Irradiation Studies of Cylindrical Thermionic Converters

Folder 6 Post Irradiation Investigations of UO₂-Fueled Thermionic Emitters

Subseries 4 Heat Pipe Systems

Folder 1 Heat Pipe Research in Europe

Folder 2 Advances in Heat Pipe Technology

Folder 3 High Temperature Lithium Heat Pipes

Folder 4 Pressure Balance and Maximum Power Density at the Evaporation Gained From Heat Pipe Experiments

Folder 5 Determination Theorique Et Experimentale De La Puissance Thermique Limite Transferee Par Des Caloducs A Sodium

Folder 6 Heat Pipe Design Theory

Folder 7 Liquid Vapour Interaction and Evaporation in Heat Pipes

Folder 8 Resultats Preliminaires D' Une Etude Sur les Caloducs Haute Temperature

Subseries 5 Materials

Folder 1 Chemical Vapor Deposition of Tungsten Emitters of (110) Preferred Crystal Orientation (U)

Folder 2 Fuel and Fission Product Transport Through Chemically Vapor Deposited Fluoride Tungsten (U)

Folder 3 Depots par Decomposition Thermique en Phase Vapour de Tungstene, Rhenium et Niobium et D' Alliage Niobium Tungstene

Folder 4 Deposition of Tungsten-Layers on Molybdenum and Interdiffusion

Folder 5 Metal-to-Ceramic Seals for Thermionic Converters

Folder 6 Scellements Ceramique-Metal

Folder 7 Multi-Foil Thermal Insulation Using Oxide Particle Layer Separation

Folder 8 Insulating Materials of Thermoemission Converters

Folder 9 On the Effect of Barium on Converter Materials

Folder 10 Utilisation Des Alliages De Titane En Conversion Thermolonique

Folder 11 A Low-Swelling, Oxide Fueled Thermionic Emitter

Folder 12 High Temperature Compatibility of Refractory Metals in Contact with Refractory Materials

Folder 13 Etude De Soudure Par Diffusion Du Molybdene

Folder 14 Investigation of Diffusion Interaction and Structural Stability of Cathode Material

Folder 15 Cermets as Material for Thermionic Emitters

Folder 16 Cesium Sorption in Materials for Thermionic Converters

Folder 17 Sur Les Applications, Aux Etudes Des Emetteurs Thermoloniques, D'Un Nouveau Reactif Du Molybdene

Subseries 6 Converter and Systems Design Analysis

Folder 1 Theory of Thermionic Converter Operation with Applications to Thermionic Reactor Analysis

Folder 2 Comparison of Methods for Calculating Radiative Heat Transfer

Folder 3 Methods of Calculation and Optimization of Thermionic Electrogenerating

Element

Folder 4 Thermionic Converter Electrical Characteristics with Matrix Circuit Connections

Folder 5 Dynamic Characteristics of a Thermionic Converter Fuel Element

Folder 6 Estimation of Volt-Current Characteristics, Temperature Fields, and Optimal Heat Generating Profile for Long Current Generating Cells

Folder 7 Influence of Current Leakage On the Output Parameters of Thermionic Converter

Folder 8 Failure Models and Reliability Analysis of Thermionic Converter Component Parts

Folder 9 Analysis and Optimization of "Full-Length" Diodes

Subseries 7 Ignited Mode Diode

Folder 1 The Spacing Effect in the Ignited Mode Diode

Folder 2 Theory of Low Voltage Arc in the Cesium Thermionic Converter

Folder 3 The Voltage Drop of the Ignited Mode as a Function of Current Density

Folder 4 Theoretical Considerations of the Ignited Mode

Folder 5 On the Theory of Electrode Layer of Plasma

Folder 6 On Low Voltage Arc in Cesium Vapor

Folder 7 Two Types of Potential Distribution in Collisionless Mode of Thermionic Converter Operation in the Presence of Transverse Magnetic Field

Folder 8 Effect of Cesium Pressure On Thermionic Stability

Subseries 8 Converter Performance Analysis

Folder 1 Calorimetric Measurements with a Heat Pipe Thermionic Converter

Folder 2 The Characteristics of Thermionic Converters Filled with Vapor Mixture

Folder 3 Unignited Mode Converter Diagnostics with Regard to Emitter Work Function Patches

Folder 4 Some Peculiarities of I-V Curves of the Thermionic Converters in Cesium Vapour

Folder 5 Experimental Verification on the Rasor Phenomenological Theory of the Arc Mode Regime of a Cesium Thermionic Converter

Folder 6 Ionization State of Cesium Thermionic Converter Plasma

Folder 7 On the Development of a Low Voltage Arc In a Thermionic Diode with Extended Electrodes

Folder 8 Kinetic Theory of Knudsen Arcs in the Mixture of Inert Gases With Cesium Vapour

Folder 9 Current Oscillations and Electromagnetic Radiation In Low Pressure Thermionic Converters

Folder 10 Low Mixture Arc in the Cesium Barium Mixture

Folder 11 Low Voltage Arc in the Cesium Inert Gas Mixture

Folder 12 Investigations on Noble Gas Converters

Folder 13 Effect of Cathodic Surface Geometric Increase on Volt Amper Characteristics of Thermionic Converter

Folder 14 Low Voltage Cesium Arc in Thermionic Converter with Extended Cathode Surface

Folder 15 Electron Scattering In Thermionic Converters by Xenon, Krypton, and Argon

Folder 16 Pulse Investigation on Thermionic Converters

Folder 17 Pre-Ignition Characteristics of Cesium Thermionic Diodes

Subseries 9 Plasma Properties

Folder 1 Theoretical and Experimental Investigation of Low-Voltage Arc in Thermionic Converter

Folder 2 The Electron Energy Distribution Function and the Rate of Non-Equilibrium Ionization in the Near Cathode Layer of the Thermionic Converter

Folder 3 The Probe and Spectral Investigations of Dense Plasma Thermionic Converters

Folder 4 On the Plasma Sheath Theory

Folder 5 An Investigation of the Ionization Mechanisms in the Ignited Mode Cesium Thermionic Converter

Folder 6 Spectroscopic Investigations in a Thermionic Converter Plasma

Folder 7 Spectrum of the Low-Voltage Discharge in a Caesium Filled Diode

Subseries 10 Surface Phenomena

Folder 1 Quantum-Thermodynamic Meaning of Electronegativity and Work Function

Folder 2 A New Interpretation of the Thermionic Emission from Bare and Covered Metal Surfaces

Folder 3 The Cathode Materials of the Thermoemission Converters Research

Folder 4 Work Function Measurements of Refractory Metals in a High Pressure Cesium Plasma for Low Probe Temperature Range

Folder 5 Preparation and Investigation of Tungsten Surfaces with Preferred Orientations

Folder 6 Recherche De Surfaces De Tungstene A Travail De Sortie Eleve

Folder 7 Evaluation of Semiconducting Collector Surfaces in Thermionic Converters

Folder 8 Wetting of Some Refractory Metals by Cesium, Potassium, and

Sodium

Folder 9 Etude De L'Adsorption Du Cesium Sur Des Monocristaux De Tungstene

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Folder 11 Work Functions of Polycrystalline W and RE in an Atmosphere of Cesium and Oxygen

Folder 12 A Critical Experiment on the Nature of Adsorbed Cesium Files

Folder 13 Etude Au Microscope A Emission De Surfaces Refractaires En Presence De Vapeur De Cesium

Subseries 11 Miscellany

Folder 1 Miscellaneous Documents

Finding aid by Paul G. Hubbard (March 1994)

Revised by Harold Housley (June 2016)