

# **Engineering Software**

P.O. Box 1180, Germantown, MD 20875

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Web Site: http://www.engineering-4e.com

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**Acknowledgments**

## **Engineering Software**

P.O. Box 1180, Germantown, MD 20875

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### ***Introduction***

***Serving the Engineering and Academic (Postgraduate, Graduate, Collegiate and Secondary Level) Communities and Government Agencies with Computer Modeling and Fine Software for Your Energy Conversion (Power and Propulsion Systems) Needs!***

Dear Prospective Customer:

**Engineering Software** is proud to introduce to you its current product line: Power and Propulsion Systems Analysis 1.1, Power Systems Analysis 1.1, Gas Dynamics 1.1, Physical Properties 1.1, Energy Conversion 1.1 and Steam Approximations 1.1

These Windows based software packages quickly, easily and reliably calculate thermodynamic and transport properties of gaseous, liquid and solid species, contain coefficients for the calculation of physical properties -- the user has the capability to use the coefficients to carry out independent engineering calculations involving physical properties of various species, steam approximations for both saturated and superheated areas, analyze power cycles, power cycle components/processes and compressible flow.

Enclosed find material describing the **Engineering Software** software packages. Free demo version can be downloaded directly from the **Engineering Software** web site: <http://www.engineering-4e.com>.

For free technical and product support, send an e-mail to [info@engineering-4e.com](mailto:info@engineering-4e.com) or call (301) 540-3605.

## **Hardware Requirements and Software Compatibility:**

**For 16 Bit Applications:** 386 or higher microprocessor, 4 MB RAM, 4-8 MB hard drive, Microsoft® Windows 98®, Windows 2000®, Windows ME® and Windows XP®

**For 32 Bit Applications:** 486 or higher microprocessor, 16 MB RAM, 10 MB hard drive, Microsoft® Windows 98®, Windows 2000®, Windows ME®, Windows XP® and Windows Vista®

To place an order, fill out the **Engineering Software** Order Form or go through the **Engineering Software** distributors: CambridgeSoft, Cetrus, Coggnos, Digital River, Engineering-Software.com(KRC Technologies), Gulf Publishing Company, Open Channel Foundation, PDHengineer.com, Petris Technology, Protexis and RedVector.com.

In case there is a problem with your order or if you would like to speed up and simplify the ordering process, you can always contact **Engineering Software directly** -- send an e-mail to **info@engineering-4e.com** or call **(301) 540-3605**.

Demo and pay (full) versions of the software packages can be bought/downloaded directly over the Internet through Digital River.

**Engineering Software** support sites can help you with ordering and download questions.

**Engineering Software** products are delivered to you with a "30 Day Money Back Guarantee" policy. Academic, Government, network, multiple users and volume price discounts available!

**Engineering Software** newsletter containing information on new releases, upgrades, updates, promotional offers etc. will be sent electronically to those interested on a quarterly basis. If you would like to get on the **Engineering Software** mailing list, send an e-mail with your return e-mail address or visit the **Engineering Software** web site and fill out the form.

**Engineering Software** would like to thank you for making this inquiry about its products/product line and ask you to visit **Engineering Software** web site regarding future special offers, product developments, enhancements and updates.

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### ***Claim Sheet***

**Engineering Software** products allow quick and reliable calculation of thermodynamic and transport properties of gaseous, liquid and solid species, contain coefficients for the calculation of physical properties, steam approximations for both saturated and superheated areas, analyze power cycles, power cycle components/processes and compressible flow.

The aforementioned engineering calculations are valid under the following assumptions:

#### **Thermodynamic and Transport Properties**

Single specie consideration

Ideal gas approach is used ( $pV=RT$ )

Specific heat is not constant

Coefficients describing thermodynamic and transport properties were obtained from the NASA Glenn Research Center at Lewis Field in Center in Cleveland, OH -- such coefficients conform with the standard reference temperature of 298.15 K (77 F) and the JANAF tables

#### **Power Cycles**

Single specie consideration -- fuel mass flow rate ignored and its impact on the properties of the working fluid

Basic equations hold (continuity, momentum and energy equations)

Specific heat is constant

#### **Power Cycle Components/Processes**

Single specie consideration

Basic equations hold (continuity, momentum and energy equations)

Specific heat is constant

#### **Compressible Flow**

Single specie consideration

Basic equations hold (continuity, momentum and energy equations)

Specific heat is constant

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### ***Background/History, Mission and Vision***

Background/History: **Engineering Software** was established in May of 1996. It is a small scale engineering IT company providing engineering e-material, e-solutions, e-courses and e-seminars for energy conversion systems -- power and propulsion systems for simple and basic cycles.

Mission: To provide affordable/low cost engineering e-material, e-solutions, e-courses and e-seminars that help users quickly, easily and reliably do their work and carry out engineering calculations related to energy conversion systems -- thermodynamic and transport properties of gaseous, liquid and solid species, coefficients for calculation of physical properties, steam approximations for both saturated and superheated areas, power cycles, power cycle components/processes and compressible flow.

Vision: To be a recognized source for affordable/low cost cost engineering e-material, e-solutions, e-courses and e-seminars that help the users (government agencies, industry and academia, collegiate and secondary level) more quickly, easily and effectively do their work, explore more options, save time and provide more confidence in carrying out engineering calculations.

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### ***Reviews/Press Releases of the Product Line***

**PETRIS TECHNOLOGY ANNOUNCES - PETRISWINDS NOW!  
- A NEW ON-DEMAND (ASP/VSP) APPLICATIONS AND  
WEB-SERVICES PLATFORM FOR THE ENERGY INDUSTRY**

HOUSTON, 22 January 2002 - Petris Technology, Inc., a leader in data management, application integration, collaboration and information solutions, announces the release of its newest offering, PetrisWINDS NOW! - an on-demand (ASP/VSP) software application and services platform for the energy industry.

PetrisWINDS NOW! - will help oil and gas companies shorten project cycle times and increase productivity on core business functions by providing easy access to best-in-class applications via the Internet.

PetrisWINDS NOW! includes software available on a monthly subscription (ASP/VSP) basis from independent software vendors (ISV) in the areas of Geology, Geophysics, Reservoir Engineering, Production, Asset & Inventory Management, Economics, Process Engineering and Construction. Also being released is PetrisWINDS Plan-IT, a new enterprise collaboration software package that applies the power of the Internet to quickly support collaborative teamwork, workflow and communication issues.

Don Humphries, PetrisWINDS NOW! Product Manager states, "By entering into a single contract with Petris, an oil & gas company, service company, marketing firm or consultant can have affordable and immediate access to needed software anywhere their employees may reside with minimal up-front capital expenditures. This agreement ensures companies always have the latest versions of their critical applications available allowing them to concentrate on core business needs and not on software related issues."

ISV software offered through PetrisWINDS NOW! includes applications from Cossey & Associates Inc (Turbidite Field & Reservoir Database); Ensyte Energy Software Int'l (Prophet, an economics model; iTREX, an asset and inventory management system and Gastar IV, a gas marketing package); Edinburgh Petroleum Services (Wellflo, a well flow and pipeline

modeling program and PanSystem, a well test simulator); **Engineering Software (Energy Conversion, a thermodynamic simulator)**; Resolve GeoSciences (SeisShow, a 2D/3D seismic viewer); TERRASCIENCES (TerraStation II, a geological & petrophysical interpretation package); and Ultramarine (MOSES, an offshore structure simulator).

The energy and utility sectors are estimated to experience an 8.5% increase in IT spending in 2002 outpacing the predicted 3.8% rise among industries overall, according to Gartner Dataquest. "The future looks bright for on-demand applications outsourcing (ASP) and web services and Petris will lead the way," says Jim Pritchett chief executive officer, Petris Technology, Inc.

Future release plans are already in the works and will include additional software from Computer Modelling Group (Reservoir Engineering & Simulation); Data Management Solutions (Gas Marketing); Ensyte Energy Software Int'l (Production Data Management); Kernel Technologies Ltd (Seismic Interpretation); Maurer Technology Inc (Drilling); Theta Enterprises, Inc (Production Engineering); TERRASCIENCES (Bore Hole Imaging) and Invensys SIMSCI (Process Engineering). Additional software and services will be added as demand increases from Petris' user community.

Additional releases will also include adapters built with the above software vendors tying their applications to PetrisWINDS Enterprise to make finding, accessing and using data a much easier process than exists today. Petris will not only make many of these applications available over the Internet but plans to install select applications behind a client's firewall leveraging a company's intranet infrastructure.

Petris Technology is a data and applications management, integration, collaboration and information solutions company focused on the needs of the energy industry. Formed in 1994, the company develops and markets customized and web-enabled software products and services. Petris is privately held and headquartered in Houston, Texas.

January 2002

American Hydrogen Association: "**Engineering Software** company has developed new software for engineers, thermodynamic analysts, and others that want to know about power and propulsion systems. Power and Propulsion Systems Analysis is a Windows based software package for such work. It is quick and reliable for calculating thermodynamic and transport properties of gaseous, liquid and solid species, analyzes power cycles, power cycle components/processes and compressible flow. We have tried this software package and found it to be a good tool

for designing power and propulsion systems.

Editor's Note: Thank you **Engineering Software** for creating this compilation in the effort to achieve sustainable prosperity."

Vol. 8, No. 1  
January 1997

CASTI Publishing: "**Engineering Software** demo version of the Energy Conversion 1.1 program has been selected for inclusion on our CD ROM featuring "The 100 Best Engineering Shareware Programs"."

July 1998

Control: "Measurement Software -- Power Systems Analysis 1.0 and Gas Dynamics 1.0 are Windows based solutions that allow speedy, precise calculation of thermodynamic and transport properties of gaseous, liquid and solid species, and also check power cycles, power cycle components and compressible flow. System requirements include any flavor of Windows, a 386 or higher CPU, 4 MB RAM and 4-8 MB of free disk space."

January 1997

Desktop Engineering: "Energy Conversion Systems Manager -- For engineers designing, operating and managing energy conversion systems, **Engineering Software** (Germantown, MD) offers Energy Conversion 1.1 for Windows 3.X or Windows '95.

Energy Conversion calculates thermodynamic and transport properties of gaseous, liquid and solid species as well as steam approximations for both saturated and superheated areas. It also analyzes power cycles, power cycle components/processes and compressible flow.

Version 1.1 offers such features as physical properties of available species for assigned two-state values, including temperature and pressure, enthalpy and pressure and entropy and pressure. Additionally, steam approximations and steam table calculations are available for both saturated and superheated areas."

July 1997

Desktop Engineering: "Power Systems and Gas Dynamics (Thermodynamic and Transport) Analyses -- **Engineering Software** (Germantown, MD) has two new Windows products: Power Systems Analysis 1.0 and Gas Dynamics 1.0.

Power Systems Analysis calculates thermodynamic and transport properties of gaseous, liquid and solid species (temperature and pressure, enthalpy and pressure and entropy and pressure), analyzes power cycles (Carnot, Brayton, Rankine, Otto and Diesel) and power cycle components and processes (compression, combustion and expansion).

Gas Dynamics calculates thermodynamic and transport properties of gaseous, liquid and solid species (temperature and pressure, enthalpy and pressure and entropy and pressure), analyzes power cycles (Carnot and Brayton), power cycle components and processes (compression, combustion and expansion) and compressible flow (velocity of sound, Mach number, properties, nozzle, normal shock, diffuser and thrust).

Both programs require Windows 3.X or Windows '95, a 386 or higher system, 4 MB of RAM and 4 MB of hard drive space. Free evaluation copies are available."  
December 1996

IEEE Spectrum: "Power Systems Analysis 1.0, introduced by **Engineering Software**, Germantown, MD, is a Windows based software program for investigating the behavior of heat engines with any of five power cycles - Carnot, Brayton, Rankine, Otto or Diesel. It analyzes power cycle components and processes (compression, combustion and expansion) and calculates the thermodynamic and transport properties (temperature and pressure, enthalpy and pressure and entropy and pressure) of gaseous, liquid and solid species. Two versions of the software are obtainable, one being intended for Windows '95, the other for Windows 3.X."

December 1996

Industrial Computing: "**Engineering Software** has developed a new Windows based software package, Power Systems Analysis 1.0, which calculates thermodynamic and transport properties of gaseous, liquid and solid species and analyzes power cycles and power cycle components. The software package "should be a good tool for anyone who is involved at various levels of designing, operating and managing power systems. It should provide the user with the opportunity to more effectively do his/her work, explore more options, save time and give more confidence in carrying out engineering calculations," according to company sources. A free evaluation copy of the program is available."

March 1997

Mechanical Engineering: "Propulsion Systems Calculations -- Gas Dynamics performs engineering calculations typically encountered in the design, operation and management of propulsion systems. The program calculates thermodynamic and transport properties (temperature and pressure, enthalpy and pressure and entropy and pressure) of gaseous, liquid and solid species. It also computes power cycles (Carnot and Brayton) as well as power cycle components and processes (compression, combustion and expansion). Compressible flow calculations performed include the velocity of sound, Mach number, properties (stagnation and static), nozzle, normal shock, diffuser and thrust.

Hardware: IBM-compatible 386 PC or higher with 4 MB of RAM and 4 MB of free hard-disk space, operating in Windows 3.X or Windows '95.

Developer: **Engineering Software**, P.O. Box 1180, Germantown, MD 20875; Phone/FAX: (301) 540-3605; E-Mail: [info@engineering-4e.com](mailto:info@engineering-4e.com)."

Vol. 119, No. 7  
July 1997

NASA Tech Briefs: "**Engineering Software**, Germantown, MD, has introduced Power Systems Analysis 1.0 power system design and management software, which calculates thermodynamic and transport properties of gaseous, liquid and solid species and analyzes power cycles and power cycle components and processes. Physical properties of available species are provided in U.S. and international units. The program runs with Windows 3.X or Windows '95 and requires 4 MB of RAM and 4 MB of hard disk space."

Vol. 21, No. 2  
February 1997

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## ***Power and Propulsion Systems Analysis 1.1-A***

ISBN 1-58514-000-7 for 16 Bit -- ISBN 1-58514-100-3 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Power and Propulsion Systems Analysis, that quickly, easily and reliably calculates thermodynamic and transport properties of gaseous, liquid and solid species, analyzes power cycles, calculates power cycle components/processes and compressible flow.

### **Thermodynamic and Transport Properties**

Temperature and Pressure ( $270\text{ K} < T < 5,000\text{ K}$ )

Enthalpy and Pressure

Entropy and Pressure

### **Power Cycles**

Carnot

Brayton (Power and Propulsion)

Rankine

Otto

Diesel

### **Power Cycle Components/Processes**

Compression

Combustion (Coal/Oil/Gas)

Expansion

### **Compressible Flow**

Velocity of Sound

Mach Number

Properties (Stagnation and Static)

Nozzle

Normal Shock

Diffuser

Thrust

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of power and propulsion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations.

To find out more about how you can profit or benefit from this software package, please send an e-mail to [info@engineering-4e.com](mailto:info@engineering-4e.com) or call **(301) 540-3605**.

Free Technical and Product Support  
30 Day Money Back Guarantee

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## ***Power and Propulsion Systems Analysis 1.1-B***

ISBN 1-58514-001-5 for 16 Bit -- ISBN 1-58514-101-1 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Power and Propulsion Systems Analysis, that quickly, easily and reliably analyzes power cycles, calculates power cycle components/processes and compressible flow.

### **Power Cycles**

- Carnot
- Brayton (Power and Propulsion)
- Rankine
- Otto
- Diesel

### **Power Cycle Components/Processes**

- Compression
- Combustion (Coal/Oil/Gas)
- Expansion

### **Compressible Flow**

- Velocity of Sound
- Mach Number
- Properties (Stagnation and Static)
- Nozzle
- Normal Shock
- Diffuser
- Thrust

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of power and propulsion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations.

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## ***Power Systems Analysis 1.1***

ISBN 1-58514-002-3 for 16 Bit -- ISBN 1-58514-102-X for 32 Bit

**Engineering Software** has developed a new Windows based software package, Power Systems Analysis, that quickly, easily and reliably calculates thermodynamic and transport properties of gaseous, liquid and solid species, analyzes power cycles, and calculates power cycle components/processes.

### **Thermodynamic and Transport Properties**

Temperature and Pressure ( $270\text{ K} < T < 5,000\text{ K}$ )

Enthalpy and Pressure

Entropy and Pressure

### **Power Cycles**

Carnot

Brayton (Power and Propulsion)

Rankine

Otto

Diesel

### **Power Cycle Components/Processes**

Compression

Combustion (Coal/Oil/Gas)

Expansion

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of power systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations.

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Web Site: <http://www.engineering-4e.com>

## ***Gas Dynamics 1.1***

ISBN 1-58514-003-1 for 16 Bit -- ISBN 1-58514-103-8 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Gas Dynamics, that quickly, easily and reliably calculates thermodynamic and transport properties of gaseous, liquid and solid species, analyzes power cycles, calculates power cycle components/processes and compressible flow.

### **Thermodynamic and Transport Properties**

Temperature and Pressure ( $270\text{ K} < T < 5,000\text{ K}$ )

Enthalpy and Pressure

Entropy and Pressure

### **Power Cycles**

Carnot

Brayton (Power and Propulsion)

### **Power Cycle Components/Processes**

Compression

Combustion (Coal/Oil/Gas)

Expansion

### **Compressible Flow**

Velocity of Sound

Mach Number

Properties (Stagnation and Static)

Nozzle

Normal Shock

Diffuser

Thrust

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of propulsion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations.

To find out more about how you can profit or benefit from this software package, please send an e-mail to [info@engineering-4e.com](mailto:info@engineering-4e.com) or call **(301) 540-3605**.

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Web Site: <http://www.engineering-4e.com>

## ***Physical Properties 1.1***

SBN 1-58514-004-X for 16 Bit -- ISBN 1-58514-104-6 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Physical Properties, that quickly, easily and reliably calculates thermodynamic and transport properties of gaseous, liquid and solid species.

### **Thermodynamic and Transport Properties**

Temperature and Pressure ( $270\text{ K} < T < 5,000\text{ K}$ )

Enthalpy and Pressure

Entropy and Pressure

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of power and propulsion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations.

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## ***Power and Propulsion Systems Analysis 1.1-C***

ISBN 1-58514-005-8 for 16 Bit -- ISBN 1-58514-105-4 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Power and Propulsion Systems Analysis, that quickly, easily and reliably analyzes power cycles, calculates power cycle components/processes and compressible flow.

### **Power Cycles**

Carnot

Brayton (Power and Propulsion)

Rankine

### **Power Cycle Components/Processes**

Compression

Combustion (Coal/Oil/Gas)

Expansion

### **Compressible Flow**

Mach Number

Nozzle

Normal Shock

Diffuser

Thrust

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of power and propulsion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations. To find out more about how you can profit or benefit from this software package, please send an e-mail to [info@engineering-4e.com](mailto:info@engineering-4e.com) or call **(301) 540-3605**.

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## ***Energy Conversion 1.1-A***

ISBN 1-58514-006-6 for 16 Bit -- ISBN 1-58514-106-2 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Energy Conversion, that quickly, easily and reliably calculates thermodynamic and transport properties of gaseous, liquid and solid species, contains coefficients for the calculation of physical properties - the user has the capability to use the coefficients to carry out independent engineering calculations involving physical properties of various species, steam approximations for both saturated and superheated areas, analyzes power cycles, calculates power cycle components/processes and compressible flow.

### **Thermodynamic and Transport Properties**

Temperature and Pressure ( $270\text{ K} < T < 5,000\text{ K}$ )

Enthalpy and Pressure

Entropy and Pressure

Coefficients

### **Steam Approximations**

Saturated Area (Temperature and Pressure Dependent)

Superheated Area

### **Power Cycles**

Carnot

Brayton (Power and Propulsion)

Rankine

Otto

Diesel

Magnetohydrodynamics

Fuel Cell

### **Power Cycle Components/Processes**

Compression

Combustion (Coal/Oil/Gas)

Expansion

Heat Transfer

Mixing

### **Compressible Flow**

Velocity of Sound

Mach Number

Properties (Stagnation and Static)

Nozzle

Normal Shock

Diffuser

Thrust

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of energy conversion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options,

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## ***Steam Approximations 1.1***

ISBN 1-58514-007-4 for 16 Bit -- ISBN 1-58514-107-0 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Steam Approximations, that quickly, easily and reliably calculates thermodynamic and transport properties of steam for both saturated and superheated areas.

### **Steam Approximations**

Saturated Area (Temperature and Pressure Dependent)

Superheated Area

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of energy conversion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations.

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Web Site: <http://www.engineering-4e.com>

## ***Physical Properties & Steam Approximations 1.1***

ISBN 1-58514-008-2 for 16 Bit -- ISBN 1-58514-108-9 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Physical Properties & Steam Approximations, that quickly, easily and reliably calculates thermodynamic and transport properties of gaseous, liquid and solid species, steam approximations for both saturated and superheated areas, analyzes power cycles, calculates power cycle components/processes and compressible flow.

### **Thermodynamic and Transport Properties**

Temperature and Pressure ( $270\text{ K} < T < 5,000\text{ K}$ )

Enthalpy and Pressure

Entropy and Pressure

### **Steam Approximations**

Saturated Area (Temperature and Pressure Dependent)

Superheated Area

This software package should prove to be a good tool for those who are involved at various levels with design, operation and management of energy conversion systems. It should provide you with the opportunity to more quickly, easily and effectively do your work, explore more options, save time and give more confidence in carrying out your calculations.

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ISBN 1-58514-009-0 for 16 Bit -- ISBN 1-58514-109-7 for 32 Bit

**Engineering Software** has developed a new Windows based software package, Energy Conversion, that quickly, easily and reliably calculates thermodynamic and transport properties of gaseous, liquid and solid species, steam approximations for both saturated and superheated areas, analyzes power cycles, calculates power cycle components/processes and compressible flow.

### **Thermodynamic and Transport Properties**

- Temperature and Pressure ( $270\text{ K} < T < 5,000\text{ K}$ )
- Enthalpy and Pressure
- Entropy and Pressure

### **Steam Approximations**

- Saturated Area (Temperature and Pressure Dependent)
- Superheated Area

### **Power Cycles**

- Carnot
- Brayton (Power and Propulsion)
- Rankine
- Otto
- Diesel
- Magnetohydrodynamics
- Fuel Cell

### **Power Cycle Components/Processes**

- Compression
- Combustion (Coal/Oil/Gas)
- Expansion
- Heat Transfer
- Mixing

### **Compressible Flow**

- Velocity of Sound
- Mach Number
- Properties (Stagnation and Static)
- Nozzle
- Normal Shock
- Diffuser
- Thrust

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