



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Banche dati per l'ingegneria

Rosalia Miceli

Biblioteca Interdipartimentale di
Ingegneria e Architettura

Diario di bordo



- Dizionario Tecnico Marolli e Manuale dell'ingegnere Nuovo Colombo su piattaforma eLexico
- ASTM Compass
- SAE Mobilus
- ASM handbooks

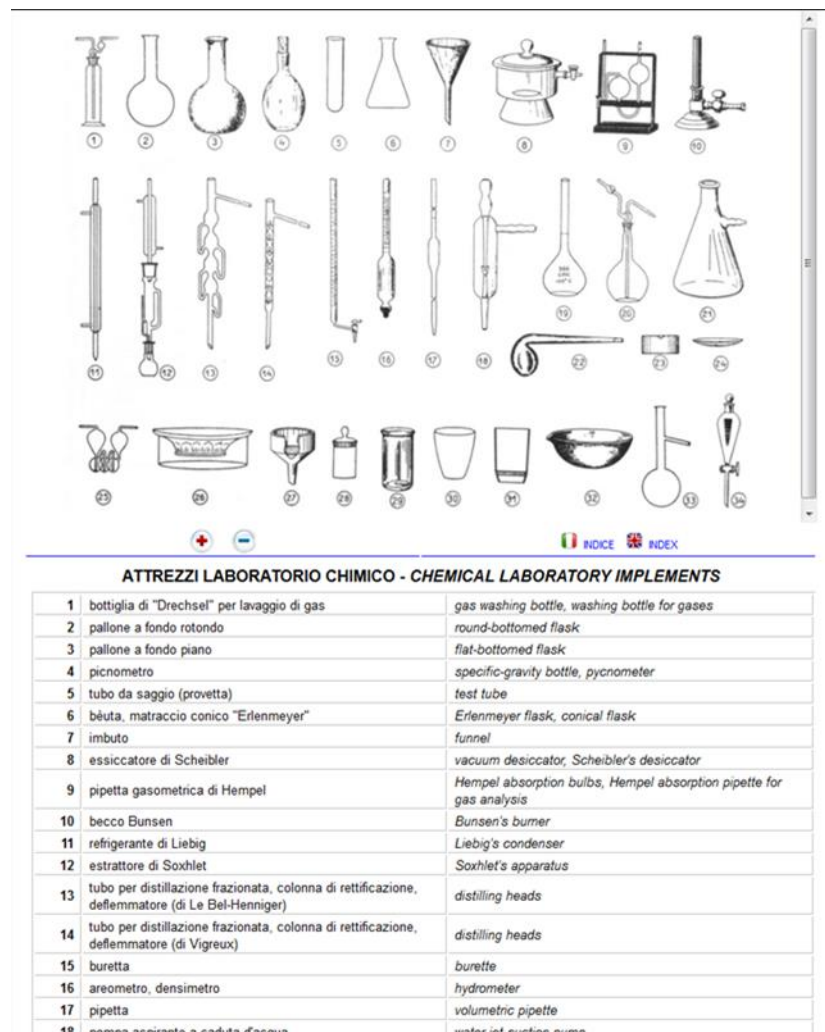


Manuale dell'ingegnere 2.0 e Dizionario tecnico Nuovo Marolli



Nuovo Marolli

- 215.000 lemmi
- selezione della terminologia di base riguardante i settori commerciale, amministrativo e aziendale
- 40 tavole grafiche online con nomenclatura specialistica



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Cerca una voce

cloruro

clorato

clorazione

cloridrina

clorite

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cloro

clorobenzolo

clorocaucciù

clorofenolo

clorofluorocarburo

cloroformio

cloroprene

clorurare

clorurato

clorurazione

cloruro

close

closed

closed-captioned

closed-circuit

closed-cycle

closedown

close-grained

close-hauled

closet

close (to)

close-up

closing

closure

clot

cloth

clothbound

clothing

clothworker

clotoide

clotting

clot (to)

cloud

GRANDE DIZIONARIO TECNICO INGLESE HOEPLI

TAVOLE ONLINE

cloruro

• (chim.), chloride.

cloruro d'ammonio (NH₄Cl) (chim.), ammonium chloride, salt ammoniac.

cloruro d'argento (AgCl) (chim.), silver chloride.

cloruro di calcio (CaCl₂), calcium chloride.

cloruro di etile (C₂H₅Cl) (med. - chim.), ethyl chloride.

cloruro di metile (CH₃Cl) (chim.), methyl chloride.

cloruro di platino (chim. fot.), platinochloride.

Ricerca istantanea: "cloruro"

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elettrici per es.) (chim. -

it.

monomer, vedi CVM.

) (chim. - mft. carta - ecc.),

Posizione nella lista: 9940 / 30917

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edgewater

GRANDE DIZIONARIO TECNICO INGLESE HOEPLI

ONLINE PLATES

edgewater

(min.), acqua sottostante i giacimenti di petrolio.

Selezione degli ambiti

accumulatori

acustica

aerodinamica

aeronautica

aeronautica militare

aerotecnica

agricoltura

amministrazione

animazione, cinema

apparati, dispositivi

architettura

assicurazione

astrofisica

astronautica

astronomia

atmosferico

atomo, atomico

attrezzatura, equipaggiamento

audiovisivi

automazione

automobilismo

biochimica

1 voce trovata

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Tavole online

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GRANDE DIZIONARIO TECNICO INGLESE HOEPLI

aeroplano

1 (aer), aeroplane (Brit.), airplane, plane.

2 vedi anche *aereo, apparecchio, velivolo*.

aeroplano a comandi riuniti (aer), combined control plane.

aeroplano a corto raggio (aer), short range airplane.

aeroplano ad ala a inclinazione variabile (aer), tilt wing airplane.

aeroplano ad ala alta (aer), high-wing airplane.

aeroplano ad ala anulare (aer), annular-wing aircraft.

aeroplano ad ala bassa (aer), low-wing airplane.

aeroplano ad ala fissa (aer), fixed-wing aircraft.

aeroplano ad ala media (aer), vedi *aereo ad ala media*.

aeroplano ad ala rotante (aer), rotary-wing aircraft, rotating-wing aircraft, rotorcraft, rotor plane.

aeroplano ad ali ripiegabili (aer), folding wing airplane.

aeroplano ad autoretore (aer), ramjet airplane.

aeroplano a decollo corto (aer mit), short takeoff aircraft.

aeroplano a decollo e atterraggio verticale (aer), vertical take-off and landing airplane, VTOL airplane.

aeroplano a decollo verticale (aer), vertical takeoff aircraft, VTOL aircraft.

aeroplano ad elica propulsiva (aer), pusher airplane.

aeroplano ad elica trattiva (aer), tractor plane.

aeroplano ad energia atomica (aer), atom-powered airplane.

aeroplano a doppia fusoliera (aer), double fuselage airplane.

aeroplano a elica (aer), propeller aircraft, propeller airplane.

aeroplano a fusoliera larga (aer), wide body airplane, wide body plane.

aeroplano a geometria variabile (aeroplano che può variare l'angolo di freccia) (aer), variable geometry aircraft.

aeroplano a getto (aer), jet plane.

aeroplano a grande autonomia (aer), long-range plane.

aeroplano a lungo raggio (aer), long range airplane.

aeroplano a medio raggio (aer), medium range airplane.

aeroplano anfibo (aer), amphibian.

aeroplano anfibo a galleggianti (aer), float amphibian.

aeroplano anfibo a scafo (aer), boat amphibian.

aeroplano antincendio (aer), firefighting airplane, water bomber airplane, vedi anche *aeroplano con prelievo a sfioro*.

aeroplano a pattini (aer), airplane on skis.

aeroplano appartenente ad una nave portaerei (aer), carrier airplane.

aeroplano a razzo (aeroplano con propulsione a razzo) (aer), rocket plane.

aeroplano a reazione (ad ossigeno atmosferico) (aer), jet plane.

25 voci trovate



Dizionario eLessico.com

TAVOLE ONLINE

From Aviation Magazine - ex Jean PERARD - Paris

INDEX

AEROPLANO - AIRCRAFT

Aereo FIAT G 91 T	FIAT type G 91 T aircraft
1 apparecchi fotografici	cameras
2 presa d'aria reattore	jet engine air intake
3 apparecchiature radio e di navigazione	navigation equipment
4 corazzatura anteriore	armor plate, front
5 pedaliera	rudder pedals
6 sportello vano gamba carrello anteriore	nose gear door
7 fari di atterraggio e rullaggio	landing and taxiing lights
8 carrello anteriore	nose gear
9 martinetto comando carrello anteriore	nose gear actuating cylinder
10 leva a squadra comando equilibratore	elevator linkage bell-crank lever
11 asta di comando aliettoni	aileron system push-pull rod
12 condotto aria	air duct
13 correttore aliettoni	aileron trim actuator
14 freni aerodinamici	air brakes
15 tronco centrale ala	central wing section
16 attacco superiore semiala	wing upper attachment
17 bordo d'attacco	leading edge
18 longherone anteriore	wing front spar
19 carrello principale	main gear



Manuale dell'ingegnere ieri e ...

Comunemente chiamato «il Colombo» tra gli ingegneri.

La prima edizione viene pubblicata da Giuseppe Colombo, direttore del Politecnico di Milano, nel 1877. Rappresenta il primo tentativo di predisporre un «*manuale di ingegneria succinto e tascabile*» in lingua italiana ... era 260 pagine

L'85ª edizione cartacea del Nuovo Colombo del 2012, redatta con i contributi di circa 240 esperti autori, contava 7000 pagine, con 4000 figure e 2000 tabelle e copriva tutti i principali argomenti necessari alla formazione dell'ingegnere



... oggi Nuovo Colombo digitale 2.0

Grande rinnovamento della storica opera prevede il progressivo e costante aggiornamento in base alle variazioni tecnologiche e normative, l'arricchimento con allegati tecnici e strumenti di calcolo forniti dagli autori

A partire dalla 85^a edizione, infatti, tutto il materiale (testo, tabelle, schemi e immagini) è stato digitalizzato e un team di autori – sotto la direzione dell'Ing. Pierluigi Riva – ne ha iniziato l'opera di aggiornamento, destinata a rivedere nel tempo l'intera struttura del Colombo.



Nuovo Colombo - Contenuti

- Matematica, topografia, estimo
- Ingegneria chimica
- Fisica applicata
- Ingegneria industriale
- Materiali e loro proprietà
- Elettrotecnica
- Scienza delle costruzioni
- Elettronica, telecomunicazioni
- Ingegneria edile
- Fonti energetiche rinnovabili
- Ingegneria meccanica
- Ingegneria gestionale
- Ingegneria dei trasporti
- Ingegneria ambientale
- Idraulica e costruzioni idrauliche
- Qualità, sicurezza



Nuovo Colombo – modalità di consultazione

- tramite l'uso del **sommario** generale e degli indici delle sezioni e dei capitoli, fino a individuare il documento corrispondente all'argomento scelto;
- tramite la ricerca nei campi **Tutto testo** e delle **Parole chiave** assegnate a ogni documento in base all'argomento trattato.
- Se vengono riempiti più campi, la ricerca viene soddisfatta dalle voci in cui compaiono tutte le condizioni poste.



Ricerche avanzate

- Per ricercare espressioni composte da più parole, racchiudere le parole tra virgolette.

Nel campo **“Tutto testo”**, per cercare un'intera frase è necessario racchiuderla tra virgolette; due o più parole (non racchiuse tra virgolette) separate da uno spazio sono considerate in OR tra loro (il risultato è formato dai documenti in cui compare almeno una delle parole); due o più parole (non racchiuse tra virgolette) separate dall'operatore **&&** sono considerate in AND tra loro (il risultato è formato dalle voci in cui compaiono tutte le parole).

Nel campo **“Parole chiave”**, più parole sono automaticamente considerate in AND tra loro (il risultato è formato dalle voci in cui compaiono tutte le parole chiave).

In ogni campo di input è possibile utilizzare i normali **caratteri jolly**: * (qualsiasi numero di caratteri) e ? (un solo carattere).



- Nella finestra del documento (in basso), le parole trovate sono evidenziate in giallo
- Cliccando con il pulsante destro del mouse su una qualsiasi parola si apre una piccola finestra di popup con i risultati della ricerca istantanea di quella parola in tutti i campi disponibili.
- I collegamenti ipertestuali tra i documenti o gli apparati sono indicati in blu e dal cambiamento nella forma del cursore del mouse.
- Figure e tabelle vengono visualizzate in due finestre di popup che si aprono cliccando il relativo collegamento.



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Parole chiave

acciaio

Cerca

Sommario

- Elettrotecnica - Linee elettriche - Linee aeree
- Fisica applicata - Misure e regolazioni industriali - Misure
- Ingegneria dei trasporti - Costruzioni navali mercantili - Materiali da costruzione degli scafi metallici e loro collegamenti
- **Ingegneria dei trasporti - Trasporti su rotaia - Armamento**
- Ingegneria dei trasporti - Trasporti su rotaia - Linee di contatto per trazione elettrica

II NUOVO COLOMBO
Manuale dell'Ingegnere HOEPLI
Versione digitale 2.0

← ↑ ↺ ↓ →

Ingegneria dei trasporti
Trasporti su rotaia
Armamento

Sono: quercia lanuginosa, rovere, farnia, cerro, pino silvestre e pino silano. Le traverse in rovere e in farnia senza alborno sono generalmente messe in opera allo stato naturale, senza preventivo trattamento conservativo di speciale antisettico (*impregnazione*); questo trattamento è comunque sempre consigliabile; le altre traverse in essenze diverse dalle sopracitate devono essere impregnate. La forma, le dimensioni, le tolleranze dimensionali e di forma, le caratteristiche del legno e dell'olio di impregnazione, le modalità di esecuzione del trattamento, le condizioni tecniche della fornitura sono indicate nella sopraccitata UNI 7407.

Le traverse in acciaio

Hanno forma  con larghezza alla base di ≈ 120 mm; in Italia sono molto scarsamente impiegate; assai più usate all'estero, non consentono velocità superiori ai 100 km/h.

Le traverse in cemento armato

Sono impiegate dalle FS sono di tipo monoblocco in conglomerato cementizio precompresso, con armatura in tondini di 7 mm di diametro, in acciaio ad alto limite elastico, ai quali, all'atto della fabbricazione delle traverse, viene data una tensione iniziale prestabilita. Vengono costruite in due lunghezze di 2,30 m e 2,60 m. Sono usate in tutte le nuove costruzioni e nel rinnovo dell'armamento delle linee principali. Nelle gallerie di metropolitane va generalizzandosi l'uso del supporto cementizio, cioè le rotaie sono ancorate, con interposizione di mezzi elastici, direttamente all'arco rovescio della galleria; il fissaggio è fatto con spinotti ancorati al cemento tramite resine epossidiche (**Fig. 6** [in [Linee di contatto per trazione elettrica](#)]).

Materiale minuto d'armamento

Sono gli elementi con i quali le rotaie vengono collegate fra loro o fissate alle traverse; i primi comprendono: le *ganasce*, le *chiavarde di giunzione* e le *rosette elastiche*; i secondi comprendono: le *piastre*, i *piastroni*, le *piastrene di stringimento* e di *distanziamento*, le *chiavarde d'ancoraggio*, le *caviglie*, le *tavolette* e le *piastre di gomma sottorotaia*. Tutti i suddetti materiali sono unificati (norme UNI da 3551 a 3562 e 3572). Per le rotaie tranviarie a gola il materiale minuto consta di: *piastre*, *ganasce*, *caviglie*, *chiavarde per giunzione delle rotaie*, *traverse di scartamento* e *chiavarde per dette traverse* (UNI da 3694 a 3699); la tabella UNI 3562 indica i materiali minuti d'armamento da usare per le varie rotaie unificate.

Distanziamento delle traverse e sfalsamento delle giunzioni



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- [Ingegneria dei trasporti - Trasporti su rotaia - Armamento](#)
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Armamento

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Sono impiegate dalle FS sono di tipo monoblocco in **conglomerato** cementizio precompresso, con armatura in tendini di 7 mm di diametro, in acciaio ad alto limite elastico, ai quali, all'atto della fabbricazione, vengono applicate le *rosette elastiche*; i secondi comprendono: le *piastre*, le *caviglie*, le *tavolette* e le *piastre di gomma sottorotaia*. Per i suddetti materiali sono indicati (norme UNI da 3551 a 3562 e 3572). Per le rotaie tranviarie a gola il materiale minuto consta di: *piastre*, *ganasce*, *caviglie*, *chiavarde per giunzione delle rotaie*, *traverse di scartamento* e *chiavarde per dette traverse* (UNI da 3694 a 3699); la tabella UNI 3562 indica i materiali minuti d'armamento da usare per le varie rotaie unificate.

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Distanziamento delle traverse e sfalsamento delle giunzioni

Ricerca istantanea: "conglomerato"

Tutto testo	22
Parole chiave	1



Tabelle e disegni

Più visitati: Nuovo Colombo 2.0 - Mozilla Firefox

www.edigeo.it/hpccoi20/Tabelle/TG08-2_7.html

Tab. 7. Masse dei più importanti strumenti di navigazione.

Strumenti vari	(kg)	Varie	(kg)
Bussola	0,9 - 3,17	Pilota	77
Anemometro	0,31 - 0,34	Paracadute	7
Altimetro	0,5 - 0,86	Apparato ricetrasmittente	12 - 15
Variometro	0,5 - 0,65	Apparecchiatura radar	85
Machmetro	0,4 - 0,5	Autopilota	18 - 80
Orizzonte artificiale	1,4 - 7	Sistema Doppler di navigazione	31 - 38
Vireobandometro	0,4 - 0,9	Air Data Computer	10 - 14
Contagiri	1,29 - 2	Sistema inerziale di navigazione	20 - 36
Teletermometro motore	0,31 - 0,41	Radioaltimetro	8,5 - 10
Manometro olio, carburante	0,44 - 1,56	Radioaltimetro	7 - 16
Flussometro	0,88 - 2,47		

an lega leggera (Gabrielli): massa ala = $(1/7800) N A b Q$
 prima definiti.
 fondamentali.
 velivoli militari (caccia) 30 - 50 kg/m².
 pi.
 ti 50 kg/m².
 al 4 al 6%.

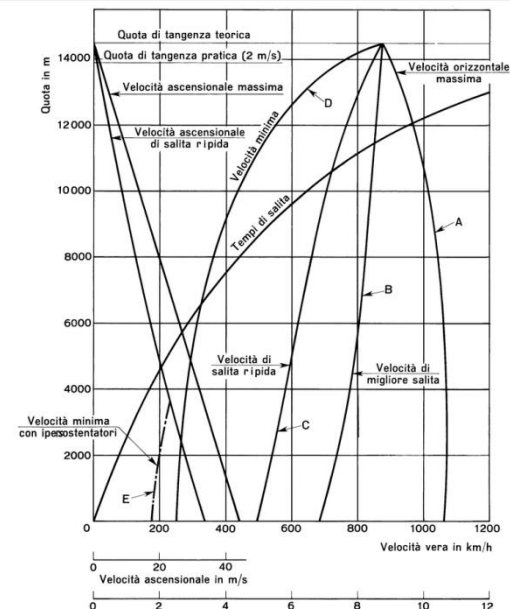
enti ai meno potenti. Per eliche e accessori v. Tab. 6.

apliche a p.v. in volo).

Motori a getto: 0,02 kg massa/N di spinta fornita.
 Massa serbatoi: in gomma 15 - 25 g/l, metallici 40 - 80 g/l.
 c) Attrezzature ed equipaggiamenti fissi (v. Tab. 7).
 Cruschetto (solo struttura) monomotore 2 - 4 kg, quadrimotore 36.

Tab. 7. Masse dei più importanti strumenti di navigazione.

Visualizza la tabella



- Nella colonna di sinistra si trovano sempre i seguenti pulsanti:



- ← collegamento al documento precedente nella cronologia dei documenti già visualizzati;
- ↑ collegamento al documento precedente nell'opera (all'interno di uno stesso capitolo);
- □ collegamento all'indice della sezione o del capitolo dal quale il documento discende;
- ↓ collegamento al documento successivo nell'opera (all'interno di uno stesso capitolo);
- → collegamento al documento successivo nella cronologia dei documenti già visualizzati

ASTM COMPASS



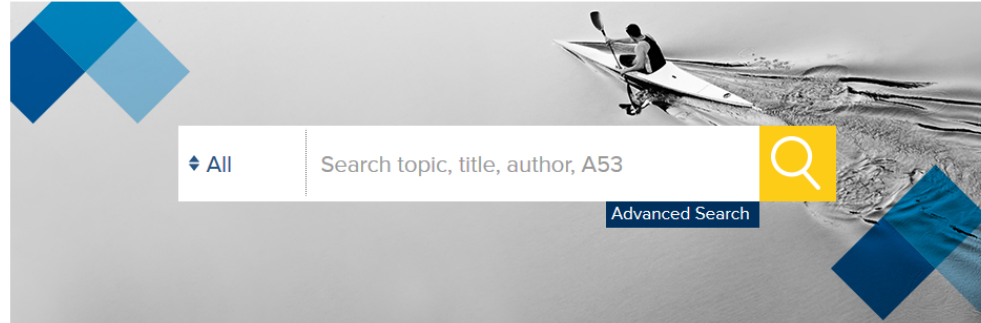
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Passport to Steel [↗](#)

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API

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MIL

Unified Numbering System (UNS)

UOP

E-LEARNING

TERMINOLOGY

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javascript: ga('send', 'event', 'Manuals', 'click', 'Open Manuals');



ALMA MATER STUDIORUM
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American Society for Testing and Materials

- Costituita nel 1898, fondata da Charles B. Dudley, un chimico della Pennsylvania
- Nel 2001 cambia nome in ASTM International.
- E' un'organizzazione senza scopo di lucro che fornisce un forum per lo sviluppo e la pubblicazione di standard internazionali di consenso volontario per materiali, prodotti, sistemi e servizi
- I membri volontari, circa 30.000, rappresentano produttori, utenti consumatori, governi, Università di oltre 140 paesi. Appartengono a uno o più comitati di stesura degli standard, ognuno dei quali copre un'area tematica come acciaio, petrolio, dispositivi medici, prodotti di consumo, nanotecnologie e molti altri e sviluppano documenti tecnici che sono alla base della produzione, gestione, approvvigionamento, codici e regolamenti per decine di settori industriali.



Industry sectors

- Aerospace and Shipbuilding
- Agriculture
- Asset Management
- Automotive
- Building and Construction
- Chemicals
- Consumer Products
- Electronics
- Energy and Utilities
- Environment
- Food Processing
- Forensics
- Health Care and Medical Devices
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- Manufacturing
- Metals
- Mining and Mineral Processing
- Oil and Gas
- Pulp and Paper
- Quality
- Safety and Security
- Services
- Sports and Leisure
- Textiles and Leather
- Transportation and Logistics



Portali tematici



Water: Standardization for an Essential Resource and Precious Commodity

Water is becoming a prominent topic in global settings as drought and population pressures increase the need for abundant sources of water. Water is considered to be one of the biggest resources and most important commodities in the 21st Century. Population pressures and rising demand combined with declining fresh water supplies is creating a tension and stress on communities and businesses worldwide. As the effects of climate change become clearer the changes in water rainfall patterns are exacerbating this increasingly challenging situation.

As defined by ASTM Committee D19 on Water, the term "water" includes, but is not limited to, surface waters (rivers, lakes, artificial impoundments, runoff, etc.), groundwaters and springwaters, wastewaters (mine drainage, landfill leachate, brines, waters resulting from atmospheric precipitation and condensation (with the exception of acid deposition), process waters, potable waters, glacial melt waters, steam, water for subsurface injection and water discharges including waterborne materials and water-formed deposits.

In an effort to continue to meet the expanding need for standardized practices and methods for water testing, transport, recycling, and safety, ASTM has compiled a listing of its current portfolio of standards related to Water.

Within the topic of Water as a Resource and Commodity, ASTM has identified five areas of interest.

To visit the ASTM Water Portal relevant to your interests, click on the links below.



Environmental Preservation, Stewardship and Sustainable Use of Water Source



Testing and Maintenance of Water Quality



Extraction, Transportation, and Infrastructure for Water



ALMA MATER STUDIORUM
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Sezione Standards- contenuti disponibili per Unibo

- **Book of standards:** 15 sezioni

All Book of Standards
Section 1 - Iron and Steel Products
Section 2 - Nonferrous Metal Products
Section 3 - Metals Test Methods and Analytical Procedures
Section 4 - Construction
Section 5 - Petroleum Products, Lubricants, and Fossil Fuels
Section 6 - Paints, Related Coatings, and Aromatics
Section 7 - Textiles
Section 8 - Plastics
Section 9 - Rubber
Section 10 - Electrical Insulation and Electronics
Section 11 - Water and Environmental Technology
Section 12 - Nuclear, Solar, and Geothermal Energy
Section 13 - Medical Device and Services
Section 14 - General Methods and Instrumentation
Section 15 - General Products, Chemical Specialties, and End Use Products

- **Research Reports:** possono contenere un elenco di laboratori partecipanti, una descrizione dei campioni, una copia delle istruzioni di laboratorio, l'attrezzatura / l'apparecchio utilizzato, una copia dei dati grezzi, un riepilogo statistico e una copia della dichiarazione di precisione e di distorsione.



Numero
standard

This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

DESIGNATION: C1421 - 18

An ASTM designation number identifies a unique version of an ASTM standard.

C1421 - 18

C = ceramic, concrete, and masonry materials

1421 = assigned sequential number

18 = year of original adoption (or, in the case of revision, the year of last revision)

Standard Test Method for Fracture Toughness of Ambient Temperature

Active Standard ASTM C1421

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[A2 PROCEDURES AND SPECIAL REQUIREMENTS FOR THE PRECRACKED BEAM METHOD](#)

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APPENDICES

[X1 PRECRACK CHARACTERIZATION, SURFACE CRACK IN FLEXURE METHOD](#)

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Standard Test Methods for Determination of Fracture Toughness of Advanced Ceramics at Ambient Temperature¹

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ASTM B470-02(2017) Standard Specification for Bonded Copper Conductors for Use in Hookup Wires for Electronic Equipment

Active Standard (Latest Version)

This specification covers stranded uninsulated bare, tin, or tin-lead alloy coated copper conductors in which wires in the strand are metallurgically bonded together by the application of heat additional tin, or tin-lead alloy for use in hookup wire for elect... More

Developed by Subcommittee B01.04 | Book of Standards Volume: 02.03

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ASTM B591-15 Standard Specification for Copper-Zinc-Tin and Copper-Zinc-Tin-Iron-Nickel Alloys Plate, Sheet, Strip, and Rolled Bar

Active Standard (Latest Version)

This specification covers the requirements for plates, sheets, strips, and rolled bars of copper-zinc-tin and copper-zinc-tin-iron-nickel alloys with Copper Alloy UNS Nos. C40500, C40810, C40850, C40860, C41100, C41300, C41500, C42200, C42500, C42520, C430... More

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DESIGNATION: D7510 - 10(2016)e1

Standard Practice for Performing Detection and Quantitation Estimation and Data Assessment Utilizing DQCALC Software, based on ASTM Practices D6091 and D6512 of Committee D19 on Water^{1, 2}

Active Standard ASTM D7510

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^{e1} NOTE—Reapproved with editorial change to 4.2.3 in December 2016.

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1.1 This software was developed to automate calculations within three ASTM standards: Practices [D2777](#) (outlier removal section), [D6091](#), and [D6512](#).

1.2 The program calculates detection estimates (DE) and quantitation estimates (QE) for the constant, straight-line, exponential, and hybrid (Rocke-Lorenzato) models of the variation of [inter or intra] laboratory standard deviation (ILSD) with concentration. Calculations are shown in the DE_QE

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DESIGNATION: E2590 - 15

Standard Guide for Conducting Hazard Analysis-Critical Control Point (HACCP) Evaluations

Active Standard ASTM E2590

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[Section 6 Basic Concepts of Hazard Analysis-Critical Control Point \(HACCP\) Evaluation](#)

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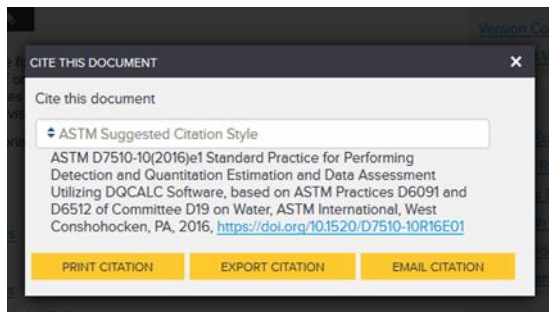
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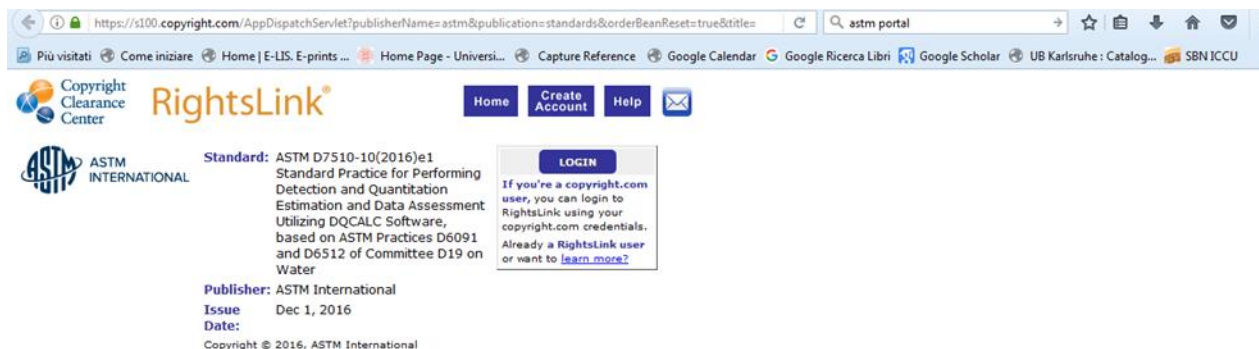
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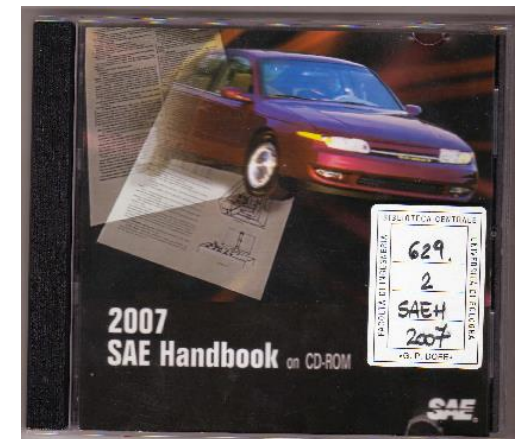
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☐ Methodology for Combustion Analysis of a Spark Ignition Engine Incorporating a Pre-Chamber Combustor

MAHLE Powertrain LLC - Michael Bunce, Hugh Blaxill

DOI: <https://doi.org/10.4271/2014-01-2603>

Published 2014-10-13 by SAE International in United States

Technical Paper
2014-01-2603

With an increasing global awareness of the need to conserve fuel resources and reduce carbon dioxide emissions, the automotive sector has been seeking gains in engine efficiency. One such method for achieving these gains on a spark ignition (SI) engine platform is through lean burn operation. Ultra-lean operation ($\lambda > 2$) has demonstrated the ability to increase thermal efficiency and significantly reduce emissions of nitrogen oxides (NO_x) due primarily to lower mean gas temperatures. Turbulent Jet Ignition (TJI), a pre-chamber-based combustion system, is a technology that enables ultra-lean operation. TJI is also an effective knock mitigation system due to the distributed nature of main chamber ignition, resulting in rapid burn rates.

☐ The Effects of Turbulent Jet Characteristics on Engine Performance Using a Pre-Chamber Combustor

MAHLE Powertrain LLC - Michael Bunce, Hugh Blaxill

Spectral Energies LLC - Waruna Kulatilaka, Naibo Jiang

DOI: <https://doi.org/10.4271/2014-01-1195>

Published 2014-04-01 by SAE International in United States

Technical Paper
2014-01-1195

Increasingly stringent US fuel economy regulation has emphasized the need for automotive engines to achieve greater levels of efficiency. Lean operation in spark ignition engines has demonstrated the ability to increase thermal efficiency, but this is typically accompanied by increased nitrogen oxides (NO_x) emissions. Ultra-lean operation ($\lambda > 2$), however, has demonstrated increased thermal efficiency and the potential for significant reductions in NO_x . Turbulent Jet Ignition (TJI) enables ultra-lean operation by utilizing radical turbulent jets emerging from a pre-chamber combustor as the ignition source for main chamber combustion in a spark ignition engine. This study seeks to better understand the interaction between the pre-chamber and main chamber combustion events, specifically the effect that particular TJI design parameters have on this interaction.

☐ A Computational Study of the Effects of Spark Location on the Performance of a Turbulent Jet Ignition System

Michigan State University - Bruce Charles Thelen, Elica Toulkon



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☐ Overview of Diesel Engine Applications: Design Characteristics of Different Appl

Navistar, Inc. - Qianfan (Harry) Xin
DOI: <https://doi.org/10.4271/2011-01-2180>
Published 2011-09-13 by SAE International in United States

Technical Paper 2011-01-2180

Dual Fuel Natural Gas/Diesel Engines: Technology, Performance, and Emissions

Engine, Fuel, and Emissions Engineering, Inc. - Christopher S. Weaver, Sean H. Turner
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1D Simulation and Experimental Analysis of a Turbocharger Compressor for Automotive Engines under Unsteady Flow Conditions

Fabio Bozza - *Universita' di Napoli*; Vincenzo De Bellis - *Universita' di Napoli*; Silvia Marelli - *Universita' di Genova*; Massimo Capobianco - *Universita' di Genova*

DOI: <https://doi.org/10.4271/2011-01-1147>

Published April 12, 2011 by SAE International in United States

Journal Article
2011-01-1147

Sector: Automotive
Topic: Simulation and modeling, Compressors, Turbochargers, Spark ignition engines
Event: SAE 2011 World Congress & Exhibition
Citation: Bozza, F., De Bellis, V., Marelli, S., and Capobianco, M., "1D Simulation and Experimental Analysis of a Turbocharger Compressor for Automotive Engines under Unsteady Flow Conditions," *SAE Int. J. Engines* 4(1):1365-1384, 2011, <https://doi.org/10.4271/2011-01-1147>.
Language: English

References

Cited By

1. Fabio Bozza, Vincenzo De Bellis, "Map-Based and 1D Simulation of a Turbocharger Compressor in Surging Operation", *SAE International Journal of Engines* 4:2418 , 2011
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2. V. Ravaglioli, N. Cavina, A. Cerofolini, E. Corti, D. Moro, F. Ponti, "Automotive Turbochargers Power Estimation Based on Speed Fluctuation Analysis", *Energy Procedia* 82:103 , 2015
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3. Stephanie Stockar, Marcello Canova, Yann Guezennec, Augusto Della Torre, Gianluca Montenegro, Angelo Onorati, "Modeling wave action effects in internal combustion engine air path systems: comparison of numerical and system dynamics approaches", *International Journal of Engine Research* 14:391 , 2013
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4. Vincenzo De Bellis, Fabio Bozza, Marco Bevilacqua, Guido Bonamassa, Christof Schernus, "Validation of a 1D Compressor Model for



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☒ NUMERICAL PREDICTION OF VARIOUS FAILURE MODES IN SPOTWELDED STEEL MATERIAL

Wichita State University - Sachin Patil
Published 2018-06-22 by SAE

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Journal Article 2018-01-9750

Crash simulation is targeted to...
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SAE International Journal of Transportation Safety
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Journal Article 2018-01-5

Geometric Components is Affected by Geometric...
d, Rikard Söderberg, Ola Isaksson

Journal Article 2018-01-5

stemming from manufacturing can be a limiting factor for the quality and reliability of products.
assessments are increasingly being performed during the early stages of product development
products are complex engineering systems, the development of which require multidisciplinary
experience. In such contexts, there are significant barriers against assessing the effects of geometrical variation on the
function of products. To overcome these barriers, this paper introduces a new methodology consisting of a modelling
approach based on a multidisciplinary simulation environment. The modelling approach is based on the parametric point
method, which allows point-scanned data to be transferred to parameterised CAD models. In a case study, the methodol...
is implemented in an industrial setting. The capability of the methodology is demonstrated through a few applications, in

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Published 2011-09-13 by SAE International in United States
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2. **Dual Fuel Natural Gas/Diesel Engines: Technology, Performance, and Emissions**
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An Efficient, Durable Vocational Truck Gasoline Engine

Thomas Reinhart and Marc Megel
Southwest Research Institute

Abstract

This paper describes the potential for the use of Dedicated EGR® (D-EGR®) in a gasoline powered medium truck engine. The project was possible to match the thermal efficiency of a medium-duty diesel engine in Class 4 to Class 7 truck operations. The project evaluated a D-EGR engine, including displacement, operating speed range, boosting systems, and BMEP levels. The engine simulation was validated by experimental experience with smaller size D-EGR engines.

The resulting engine fuel consumption maps were applied to two vehicle models, which ran over a range of 8 duty cycles at 3 pi thorough evaluation of how D-EGR and conventional gasoline engines compare in fuel consumption and thermal efficiency to show that D-EGR gasoline engines can compete with medium duty diesel engines in terms of both thermal efficiency and GHG emissions. Since gasoline engines use less energy per gallon than diesel, the D-EGR engine will have higher fuel consumption in gallons than the diesel, but the higher price of diesel fuel in the US market.

D-EGR also results in much lower in-cylinder and exhaust temperatures, which will help improve durability compared to a conventional gasoline engine with its 3-way catalyst will be far cheaper than a diesel with DPF and SCR, so there is an opportunity for gasoline engines to regain market share.

CITATION: Reinhart, T. and Megel, M. "An Efficient, Durable Vocational Truck Gasoline Engine." *SAE Int. J. Engines* 9(3):1437-1448, 2016, <https://doi.org/10.4271/2016-01-0660>

Introduction

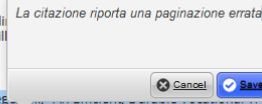
In a project for NHTSA, SwRI evaluated a range of potential fuel saving technologies for trucks ranging from Class 2b (3/4 ton pickups) to long haul tractor-trailer trucks [1, 2, 3, 4, 5]. Part of this project involved looking at both gasoline and diesel engine fuel saving technologies. One striking outcome was the efficiency potential for downsized and boosted gasoline engines using EGR. EGR allows gasoline engines to avoid or limit the timing retard that is normally required to avoid knock at low speed and high load. EGR also allows the engine to avoid the enrichment that is normally used to limit temperatures at high speed and load. A third benefit of EGR is reduced pumping work at light load. As a result, downsizing and boosting with the use of EGR leads to substantial improvements in gasoline engine brake thermal efficiency.

The results of the NHTSA project suggest that for a medium truck application, it should be possible to approximately match the thermal efficiency of a modern diesel engine using a boosted gasoline engine using D-EGR. The purpose of the project described in this paper was to explore the range of displacements, BMEP, and speed ranges that could be used, and determine the best parameter combinations for a gasoline D-EGR medium truck engine. SwRI has been working on D-EGR engines for several years. The work has been conducted using internal research funding, projects conducted by the HEDGE consortium (High Efficiency Dilute Gasoline Engine), and single client projects. A recent light duty passenger car D-EGR project is documented in [6].

CLOSE

show that D-EGR gasoline engines can compete with medium duty diesel engines in terms of both thermal efficiency and GHG emissions. Since gasoline engines use less energy per gallon than diesel, the D-EGR engine will have higher fuel consumption in gallons than the diesel, but the higher price of diesel fuel in the US market.

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CITATION: Reinhart, T. and Megel, M. "An Efficient, Durable Vocational Truck Gasoline Engine." *SAE Int. J. Engines* 9(3):1437-1448, 2016, <https://doi.org/10.4271/2016-01-0660>



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Abstract

This paper describes the potential for the use of Dedicated EGR® (D-EGR®) in a gasoline powered medium truck engine. The project goal was to determine if it is possible to match the thermal efficiency of a medium-duty diesel engine in Class 4 to Class 7 truck operations. The project evaluated a range of parameters for a D-EGR engine, including displacement, operating speed range, boosting systems, and BMEP levels. The engine simulation was done in GT-POWER, guided by experimental experience with smaller size D-EGR engines.

The resulting engine fuel consumption maps were applied to two vehicle models, which ran over a range of 8 duty cycles at 3 payloads. This allowed a thorough evaluation of how D-EGR and conventional gasoline engines compare in fuel consumption and thermal efficiency to a diesel. The project results show that D-EGR gasoline engines can compete with medium duty diesel engines in terms of both thermal efficiency and GHG emissions. Since gasoline has less energy per gallon than diesel, the D-EGR engine will have higher fuel consumption in gallons than the diesel, but the higher price of diesel fuel makes up for this difference in the US market.

D-EGR also results in much lower in-cylinder and exhaust temperatures, which will help improve durability compared to a conventional gasoline engine. A D-EGR engine with its 3-way catalyst will be far cheaper than a diesel with DPF and SCR, so there is an opportunity for gasoline engines to regain medium truck market share.

CITATION:

Reinhart, T. and Lemata SAE Int. J. Engines 9(3):1437-1448, 2016, <https://doi.org/10.4271/2016-01-0660>.

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Truck Gasoline Engine.

Introduction

In a project for NHTSA, SwRI evaluated a range of potential fuel saving technologies for trucks ranging from Class 2b (3/4 ton pickups) to long haul tractor-trailer trucks [1, 2, 3, 4, 5]. Part of this project involved looking at both gasoline and diesel engine fuel saving technologies. One striking outcome was the efficiency potential for downsized and boosted gasoline engines using EGR. EGR allows gasoline engines to avoid or limit the timing retard that is normally required to avoid knock at low speed and high load. EGR also allows the engine to avoid the enrichment that is normally used to limit temperatures at high speed and load. A third benefit of EGR is reduced pumping work at light load. As a result, downsizing and boosting with the use of EGR leads to substantial improvements in gasoline engine brake thermal efficiency.

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Historical Background

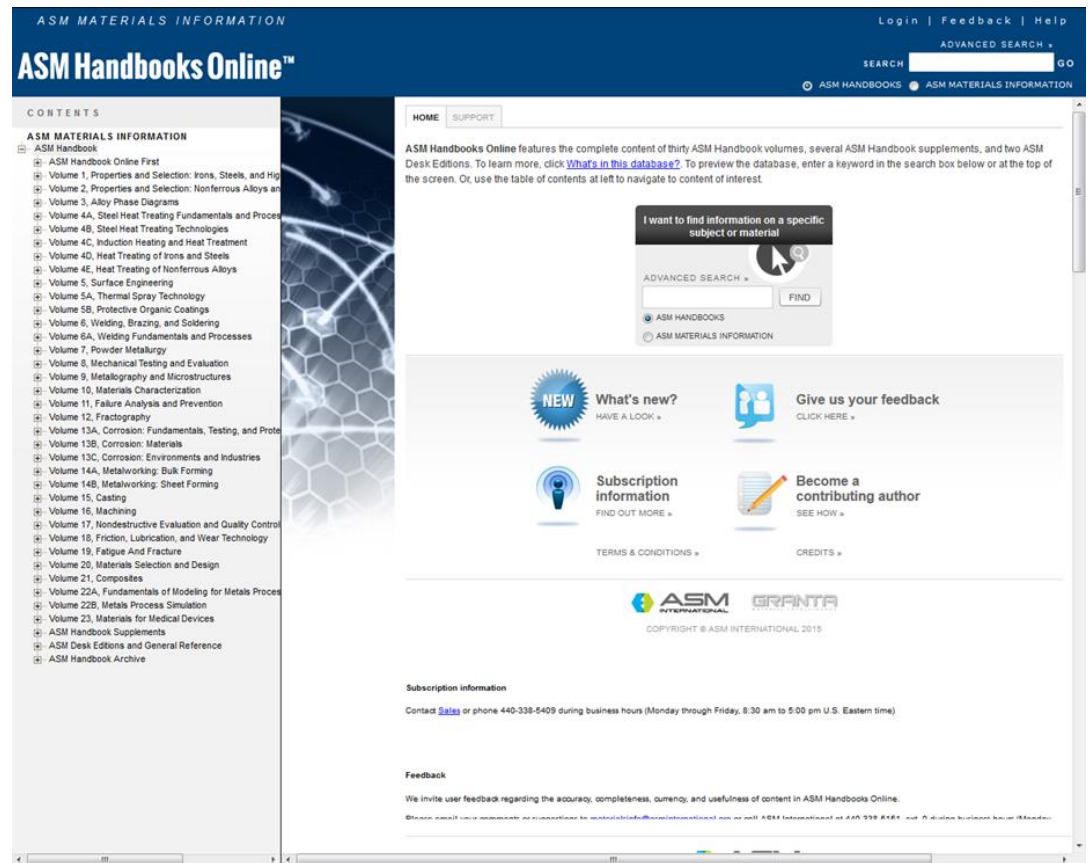
In the 1940s and 1950s, most medium- and heavy-duty trucks in North America were powered by gasoline engines. The same was true of off road equipment such as agricultural tractors and construction equipment. In the 1960s and 1970s, diesel engines took over the market for heavy duty trucks, and in the 1980s diesel engines went from a small share of vocational trucks to the dominant share. The factors driving the diesel takeover of the truck market were fuel

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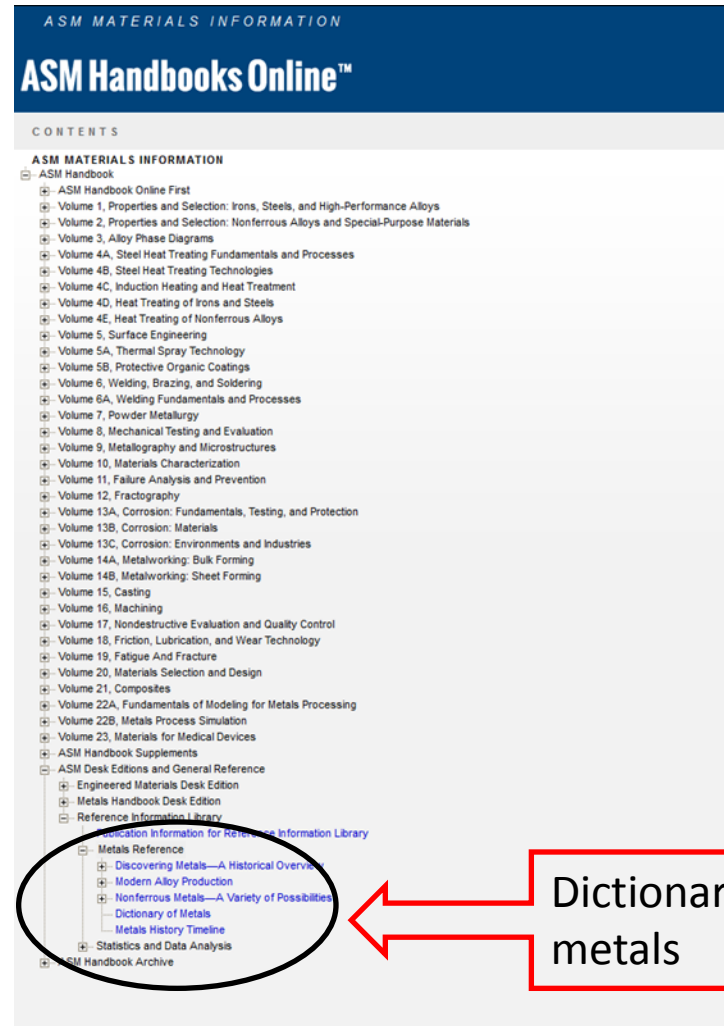
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