

مؤسسة المواصفات والمقاييس  
Jordan Institution For Standards & Metrology



# What is JISM?

The Jordan Institution for Standards and Metrology (JISM) is the national standards body in Jordan. •

JISM is a governmental institution established in 1995 to replace completely its predecessor, the Jordanian Directorate of Standards (JDS) that was founded in 1972. •

JISM is responsible for the development of Jordanian Standards and ensuring conformity with them. In addition, JISM maintains and supervises the national system for Metrology. •

# Jordan Institution For Standards and Metrology Location Map.

Al Shmiesani

Sport City Circle

Meridian Hotel

Queen Noor Street

Jamal Abed EL-Nasser Circle

Al-Esteqlal Highway

Ministry of Industry and Trade



Al-Sharief Al Raed Str.

Concord Theatre

Al Abdali

Jabal Al-Hussein

# The New Building



# The aims of JISM



- To protect the health and safety of consumers and environment through the conformity of goods and services to mandatory requirements stated in the Jordanian technical regulations.
- To support the national economy by promoting the use of standards in industrial and service quality and reliability.
- To keep up with the developments in the international practices concerning standardization, metrology, conformity assessment procedures and accreditation to obtain international competence recognition.
- To cooperate with international and regional standardization, conformity assessment and accreditation bodies.

# The aims of JISM

- To harmonize Jordanian Standards and Technical regulations with International, European, Regional and Arab Standards.
- To develop Jordanian standards that meet the needs of users, industrial and technological development and to ensure that they are practical for use.
- To provide users with information on currently valid international, regional and foreign standards, technical regulations and conformity assessment guides and procedures.

# Membership in regional and international organizations

- A working member of AIDMO.
- A full member of ISO.
- A member of ISONET.
- An enquiry point for TBT/WTO.
- An affiliate member of ILAC.
- A contact point of CODEX.
- ..... Member of OIML.

# JS Standards

- The Jordan Institution of Standards and Metrology is the nationally recognized body in the Hashemite Kingdom of Jordan for issuing standards (officially designated "Jordanian Standards"). The Standardization Department in the Institution applies accepted international practices and procedures in preparing and reviewing Jordanian standards, taking into consideration all the requirements of the agreements signed by the Kingdom at the international and regional levels, e.g. WTO agreements: TBT and SPS, Euro-Jordanian Partnership Agreement, USA/Jordan Free Trade Agreement

# What is a standard ?

- measures approved by a Recognised Body that provide, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is voluntary (i.e. not mandatory)

# What is a Technical Regulation?

- measures which lay down product characteristics or their related processes and production methods, with which compliance is mandatory

# The standardization processes

- At the national level, the standardization work is conducted by standards committees or working groups, which are made up of representatives of industry, research institutes, public authorities, consumer or professional bodies. These committees may call upon the assistance of experts in their work.
- At the regional and international levels, the work is conducted by technical committees for the secretariats of which, responsibility is assumed by the national standards bodies. These technical committees are created by the technical management boards of the relevant regional or international bodies. All national members are entitled to be represented within the international or regional committee dealing with a specific subject matter

# Phases of JS



# AUTOMOTIVE GASOLINE

## Jordanian Technical • Regulation

164:2008 •

# INTRODUCTION

- Jordan Institution for standards and metrology, JISM, is the national standardization body. The work of preparing national standards and Technical regulations is normally carried out through JISM technical committees formed from interested parties from both public and private sectors.

# INTRODUCTION

- Therefore, upon the request of the **Ministry of Energy and Mineral Resources and Ministry of Environment**, the technical committee No.6 “Petroleum and Petroleum products committee” studied, amended the JTR 164:2004 and recommended to adopt JTR 164:2008 in reference to JISM LAW Art. 5, Par. a , Clause 1.

# Scope

- This technical regulation specifies requirements for unleaded gasoline used as petrol engine vehicles in Jordan.

# Normative References

- The following referenced documents are indispensable for the application of this document (TR). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

# Normative References

<b>JS</b>	<b>ISO</b>	<b>EU</b>	<b>ASTM D</b>
1664	2160	237	1319
	3170	1601	1613
	3171	12177	
	3405	13016-1	
	6246	14275	
	7536	25163	
	12185	25164	
	14596		

# CHANGES

Property	1998			2004			2008	
Octane No.	88	96	92	87	95	92	90	95
RON	--	---	---	87	95	92	90	95
MON	--	---	---	87	85	82	Reported	
Lead cont.	0.83 gm/Lit		0.013	150	150	50	5 ppm	
Sulfur cont.	0.20 m/m %			150 ppm			5 ppm	
Aromat. Comp.	-----			42 %			35 %	
Ethers >5atoms	-----			15 %			15 %	

Continue →  
**CHANGES**

<b>Property</b>	<b>1998</b>	<b>2004</b>	<b>2008</b>
Marking and dyes	-----	-----	exist
Phosphorus	Not mentioned	Not mentioned	Phosphorus is not allowed.

# Terms and Definitions

## Gasoline ?

- For the purposes of this standard Gasoline is defined as a petroleum-derived liquid mixture consisting mostly of aliphatic hydrocarbons, enhanced with iso-octane or the aromatic hydrocarbons toluene and benzene to increase its octane rating, and is primarily used as fuel in internal combustion engines

# Terms and Definitions

## Octane Number

- It is a number refers to the efficiency of the ignition of the gasoline as a fuel engine.

# Terms and Definitions

## Research Octane Number

**RON:** is determined by running •  
the fuel in a test engine with a  
variable compression ratio under  
controlled conditions, and  
comparing these results with  
those for mixtures of iso-octane  
and n- heptane.

# Terms and Definitions

## Motor Octane Number

- (**MON**): or the aviation lean octane rating, which is a better measure of how the fuel behaves when under load. MON testing uses a similar test engine to that used in RON testing, but with a preheated fuel mixture, a higher engine speed, and variable ignition timing to further stress the fuel's knock resistance. A measure of resistance to self-ignition (knocking) of a gasoline under laboratory conditions which correlate with road performance during highway driving conditions.

# Terms and Definitions

Continue MON 

- The percentage by volume of Isooctane in a mixture of (Isooctane **2,2,4-Trimethylpentane** and n-heptane) that knocks with the same intensity as the fuel being tested. Standardized test engine operating under standardized conditions (900 rpm) is used. This test approximates cruising conditions of an automobile ; ASTM D 2723.
- Depending on the composition of the fuel, the MON of a modern gasoline will be about 8 to 10 points lower than the RON. Normally fuel specifications require both a minimum RON and a minimum MON.

# Terms and Definitions

## Anti-Knock Index (AKI)

- In most countries (including all of Europe and Australia) the "headline" octane that would be shown on the pump is the RON, but in the United States, Canada and some other countries the headline number is the average of the RON and the MON, sometimes called the **Anti-Knock Index (AKI), Road Octane Number (RdON), Pump Octane Number (PON), or  $(R+M)/2$** . Because of the 8 to 10 point difference noted previously, this means that the octane in the United States will be about 4 to 5 points lower than the same fuel elsewhere: 87 octane fuel, the "regular" gasoline in the US and Canada, would be 91-92 in Europe. However most European pumps deliver 95 (RON) as "regular", equivalent to 90-91 US  $(R+M)/2$ , and even deliver 98 (RON) or 100 (RON).

## In other words

- $RON = (8 - 10) + MON$

- $AKI = (RON + MON) / 2$

$$AKI = (4 - 5) + RON$$

90 --- 91 US Equiv. to 95 in Europe.

# LEAD CONTENT

Typical octane booster additives include tetra-ethyl lead, MTBE and Toluene.

Tetra-ethyl lead is easily decomposed to its component radicals, which react with the radical from the fuel and oxygen that would start the combustion, thereby delaying ignition. This is why leaded gasoline has a higher octane rating than unleaded.

# Hydrocarbons in gasoline

- Hydrocarbons ( HCs ) are any molecules that just contain hydrogen and carbon, both of which are fuel molecules that can be burnt ( oxidized ) to form water (  $H_2O$  ) or carbon dioxide (  $CO_2$  ). If the combustion is not complete, carbon monoxide (  $CO$  ) may be formed. As  $CO$  can be burnt to produce  $CO_2$ .

# Oxygenates ?

- Oxygenates are just pre-used hydrocarbons. They contain oxygen, which can not provide energy, but their structure provides a reasonable anti-knock value, thus they are good substitutes for aromatics, and they may also reduce the smog-forming tendencies of the exhaust gases.

- Most oxygenates used in gasoline are either alcohols (  $C_x-O-H$  ) or ethers (  $C_x-O-C_y$  ), and contain 1 to 6 carbons.
- Oxygenates are added to gasoline to reduce the reactivity of emissions.

# Examples of Oxygenates

- From fossil fuels :
  - Methanol (MeOH)
  - Methyl tertiary butyl ether (MTBE) which is produced by reacting methanol ( from natural gas ) with isobutylene in the liquid phase over an acidic ion-exchange resin catalyst at 100° C.
  - tertiary amyl methyl ether (TAME).

From biomass:

- Ethanol (EtOH)
- Ethyl tertiary butyl ether (ETBE))

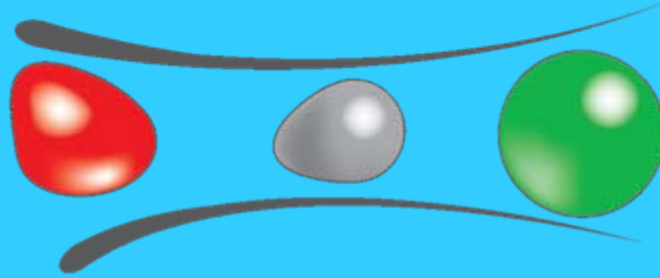
# SULFUR

- Sulfur in the fuel creates corrosion, and when combusted will form corrosive gases that attack the engine, exhaust and environment. Sulfur also adversely affects the alkyl lead octane response and may poison exhaust catalysts. The copper strip corrosion test and the sulfur specification are used to ensure fuel quality. The copper strip test measures active sulfur, whereas the sulfur content reports the total sulfur present.

# Is gasoline toxic or carcinogenic?

- **It is said that** there are several known toxins in gasoline, some of which are confirmed human carcinogens. The most famous of these toxins are **lead and benzene**. Lead alkyls also require ethylene dibromide and/or ethylene dichloride scavengers to be added to the gasoline, both of which are suspected human carcinogens

- The biggest danger remains the flammability, and the relative hazards should always be kept in perspective. The major toxic risk from gasoline comes from breathing the tailpipe, evaporative, and refueling emissions, rather than occasional skin contact from spills. Breathing vapors and skin contact should always be minimized.



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شكرا لاستماعكم

**Thank you for  
Listening**