VINCI TECHNOLOGIES
Laboratory and field instruments for Petroleum Industry

ROCK-EVAL 7

DEVICE :

Considered to be a pioneer in Petroleum Laboratory know-how, **Vinci Technologies** has been offering **Rock-Eval** devices since the 1970s (240+ units worldwide – **more than 40 years of experience**), committed to bring to market the **best engineering solutions and innovations** to **bolster major discoveries**.

The **Rock-Eval 7** is the latest advanced **open environment thermal analysis instrument** developed in our laboratories. It takes over the function of its predecessor the Rock-Eval 6 (**analysis of hydrocarbons, CO and CO_2)** with even **more advanced analysis techniques** and **new data acquisition methods** allowing a better understanding of the issues linked to oil exploration and exploitation.
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➔ *Rock-Eval 7*

Rock-Eval allows a million year long process of thermal cracking to be replicated and assessed in about one hour.

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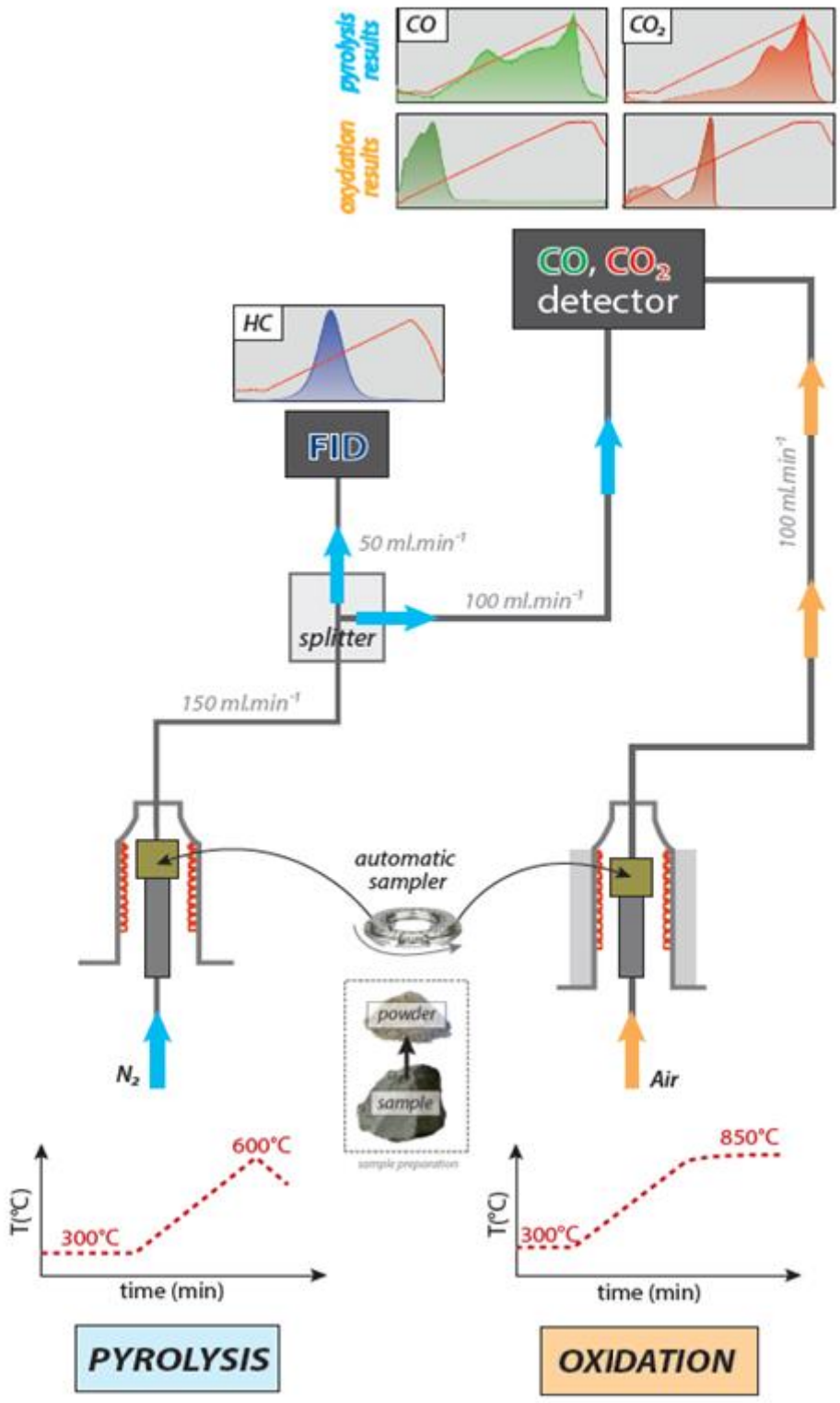
NEW FEATURES:

- Possibility to start **pyrolysis cycle** run at **20°C above ambient temperature**.
- Ability to perform elaborate, **user-specified oven heating profiles**.
- New HMI : **RockSeven®.**
- New interpretation software: **GEOWORKS®.**
- **New firmware and electronics.**
- **New instrumental hardware.**



➔ *Rock-Eval 7 synoptic*

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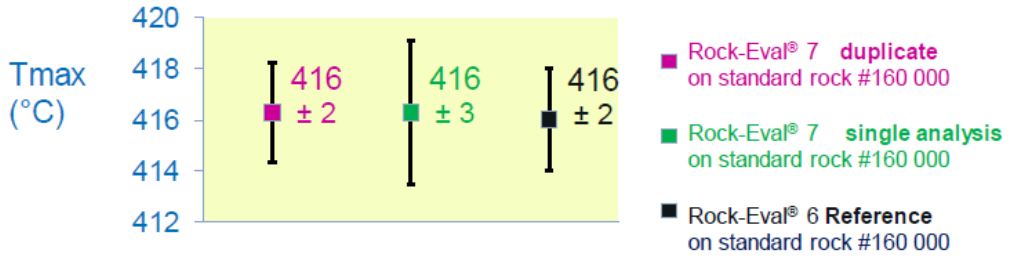
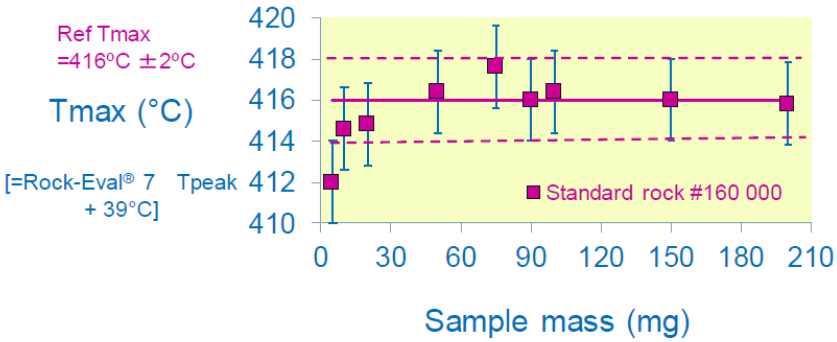
CONSISTENCY, LINEARITY & ACCURACY:

During the pyrolysis cycle, **hydrogen containing compounds** are measured by a **Flame Ionization Detector (FID)**. **Oxygen-containing products** from both pyrolysis and oxidation ovens are measured by **infrared cells**. Dedicated ovens permit a **higher measurement accuracy**. Uniform and stable heating **minimizes analysis time and reduces experimental error**.

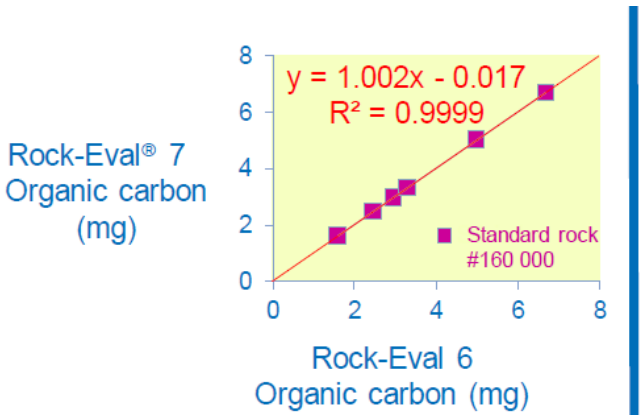
The performance of the method was statistically evaluated on the **main parameters**, through the criteria **of linearity, precision compared to Rock-Eval 6 and accuracy compared to elementary analysis** *(data presented at **IMOG 2019**)*.

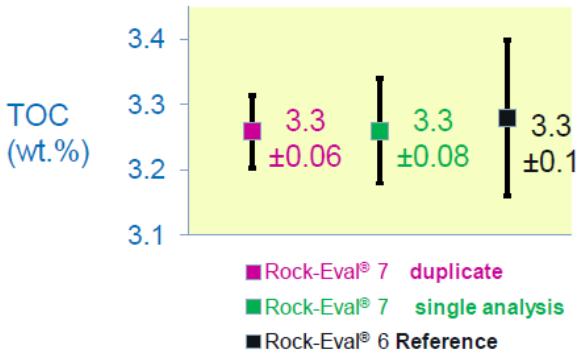
Tmax:





TOC:





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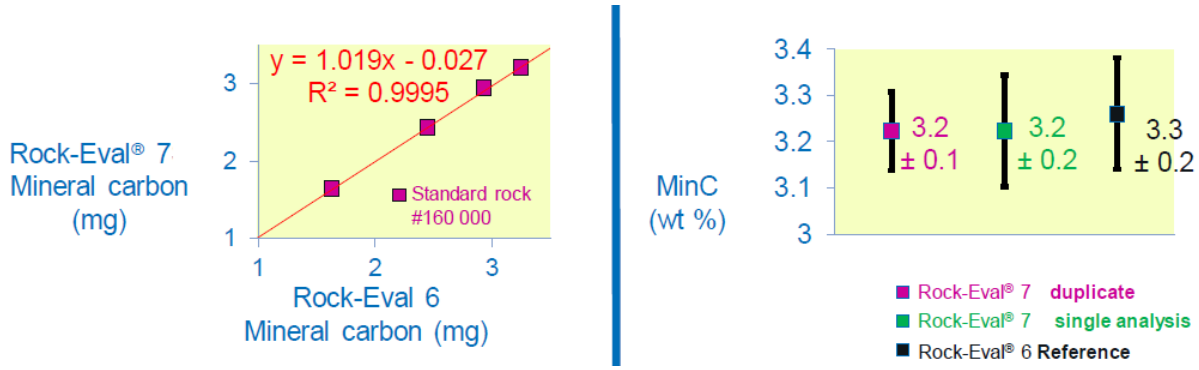
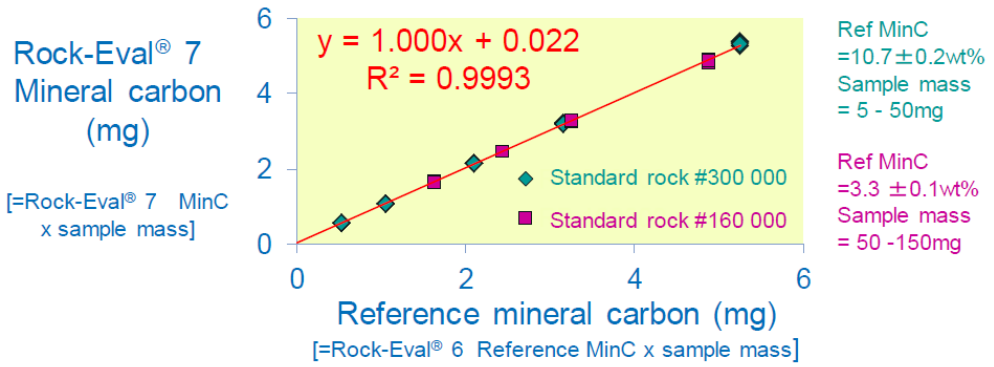
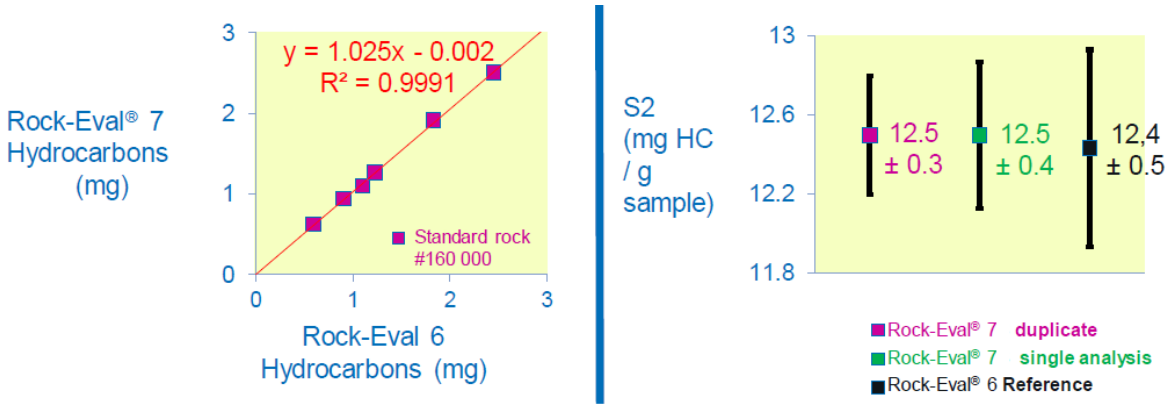
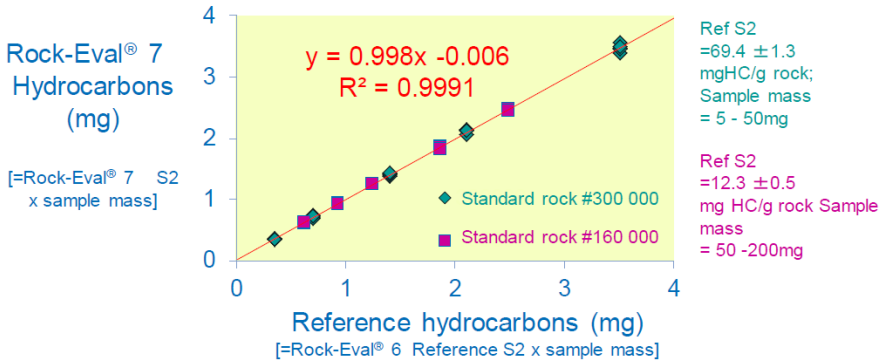
MinC:





S2:





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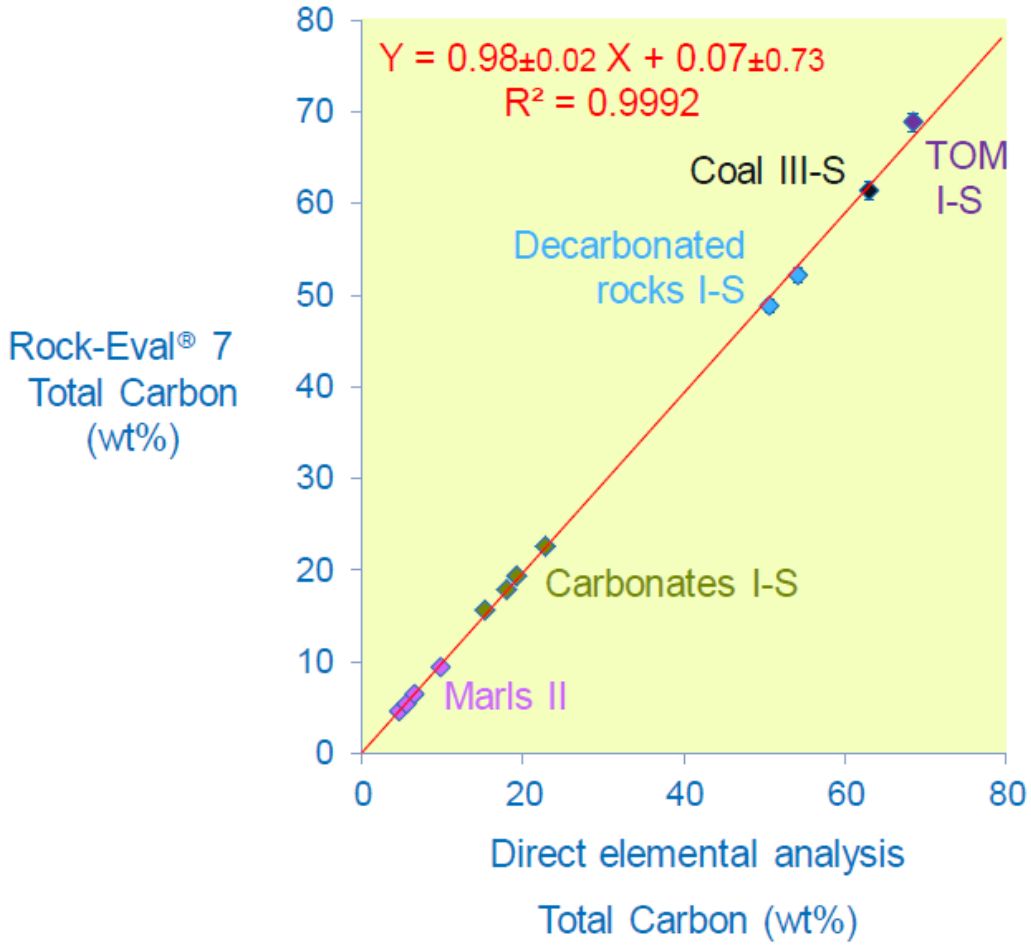
Ctot:



APPLICATIONS:

- **Oil exploration:** classical use of Rock-Eval for the screening of source rocks and reservoirs, as well as basin modelling applications.
- **Gas shale exploration**: total quantities of gas generated allow a better selection of the layers to be exploited. The choice of a HC kinetics distribution, representative of the bedrock levels, is a key element for sedimentary basins modelling.
- **Reservoirs studies:** extensive reservoir studies and information on the oils contained, such as NSO compounds and API index. Results allowing potential modeling and comprehensive studies.
- **Refining sector:** quantitative analysis of organic sulfur in crude oils and a rapid determination of labile and / or refractory sulfur content.
- **Soil studies**: characterization of organic matter in different types of soils and the following of its early evolution in fallows.

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RESULTS AND CALCULATED PARAMETERS:

For bulk rock method:

- ✓ S1 - S2 - Tmax
- ✓ S3CO / S3CO2 (Pyrolysis Organic carbon)
- ✓ S4CO / S4CO2 (Residual Organic Carbon)
- ✓ S5 (Oxidation Mineral Carbon)
- ✓ Total Organic Carbon (TOC)
- ✓ Total Mineral Carbon (MinC)
- ✓ Hydrogen Index (HI)
- ✓ Oxygen Index (OI)

For reservoir method:

- ✓ S1r - S2a – S2b- TmaxS2b
- ✓ S3CO / S3CO2 (Pyrolysis Organic carbon)
- ✓ S4CO / S4CO2 (Residual Organic Carbon)
- ✓ S5 (Oxidation Mineral Carbon)
- ✓ Total Organic Carbon (TOC)
- ✓ Total Mineral Carbon (MinC)
- ✓ Hydrogen Index (HIS2b)
- ✓ Oxygen Index (OIS2b)
- ✓ Light oil & Heavy oil
- ✓ NSO & API index

For gas shale method:

- ✓ S0 - S1'- S2'- S2"– TmaxS2"
- ✓ S3CO / S3CO2 (Pyrolysis Organic carbon)
- ✓ S4CO / S4CO2 (Residual Organic Carbon)
- ✓ S5 (Oxidation Mineral Carbon)
- ✓ Total Organic Carbon (TOC)
- ✓ Total Mineral Carbon (MinC)
- ✓ Hydrogen Index (HI)
- ✓ Oxygen Index (OI)

For pure oil method:

- ✓ S1r - S2a – S2b- TmaxS2b
- ✓ S3CO / S3CO2 (Pyrolysis Organic carbon)
- ✓ S4CO / S4CO2 (Residual Organic Carbon)
- ✓ Total Organic Carbon (TOC)
- ✓ Hydrogen Index (HIS2b)
- ✓ Oxygen Index (OIS2b)
- ✓ Light oil & Heavy oil
- ✓ NSO & API index

For kerogen method:

- ✓ S1 - S2 - Tmax
- ✓ S3CO / S3CO2 (Pyrolysis Organic carbon)
- ✓ S4CO / S4CO2 (Residual Organic Carbon)
- ✓ Total Organic Carbon (TOC)
- ✓ Hydrogen Index (HI)
- ✓ Oxygen Index (OI)

For coal method:

- ✓ S1 - S2 - Tmax
- ✓ S3CO / S3 (Pyrolysis Organic carbon)
- ✓ S4CO / S4CO2 (Residual Organic Carbon)
- ✓ Total Organic Carbon (TOC)
- ✓ Hydrogen Index (HI)
- ✓ Oxygen Index (OI)

For multi-heating rate method:

- ✓ Q1 to Q6 - Tpeak
- ✓ S3CO / S3CO2 (Pyrolysis Organic carbon)
- ✓ S4CO / S4CO2 (Residual Organic Carbon)
- ✓ Total Organic Carbon (TOC)
- ✓ Total Mineral Carbon (MinC)
- ✓ Hydrogen Index (HI)
- ✓ Oxygen Index (OIS2b)

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