



# **DHA – DETAILED HYDROCARBON ANALYSIS**

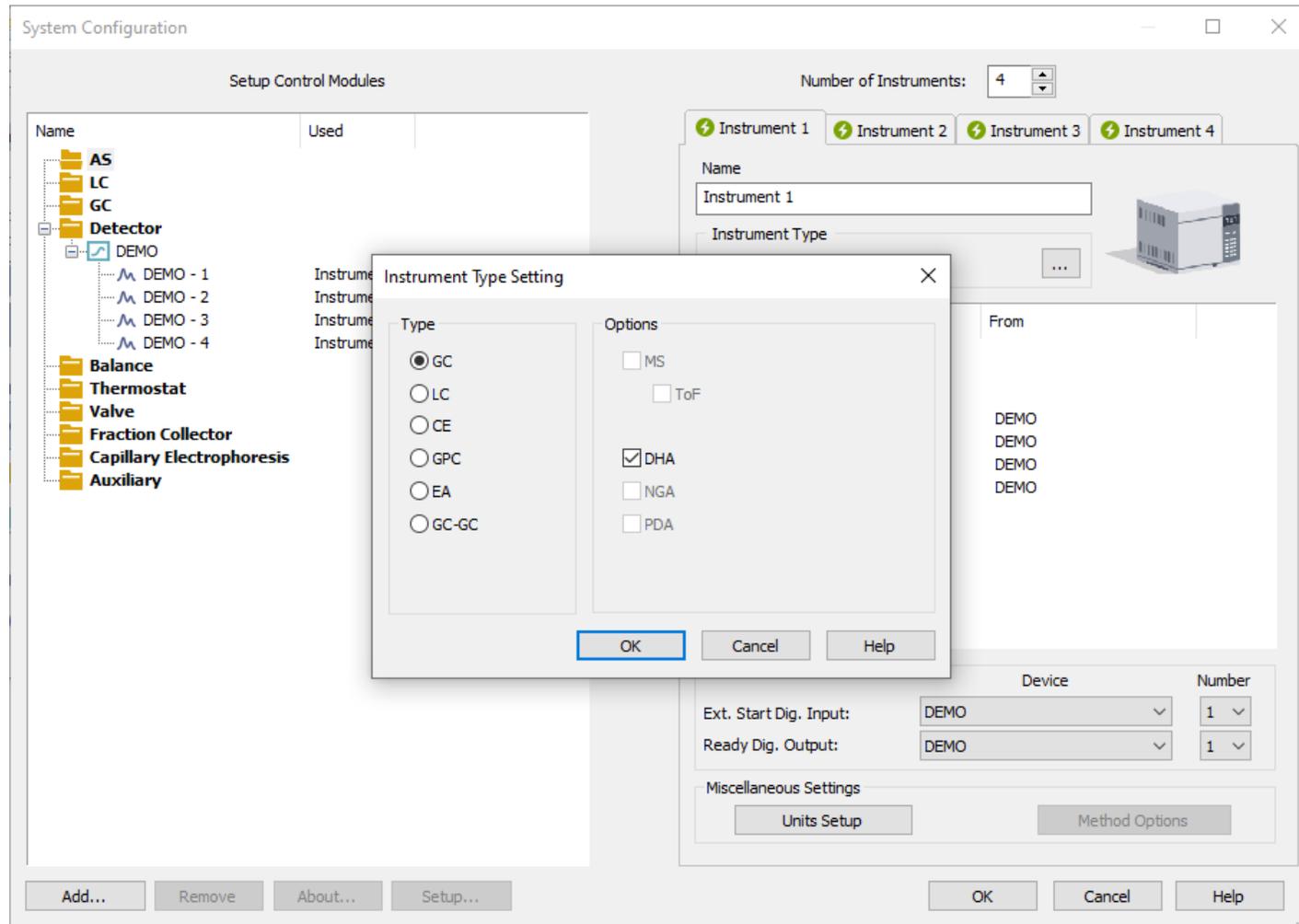
## **CLARITY EXTENSION**

P023/80A 05/2020



# DHA

- ➔ Determination of individual components in spark ignition engine fuel
- ➔ Calculation of % Area/Weight/Volume
  - Particular compounds – DHA Results
  - Hydrocarbon groups – DHA Group Results (PONA, PIONA, ...)
- ➔ ASTM D-6730
  - Preinstalled standard test method
- ➔ Custom method development



- DHA Instrument is configured in the System Configuration window
- DHA can be enabled on station where p/n A33 is purchased

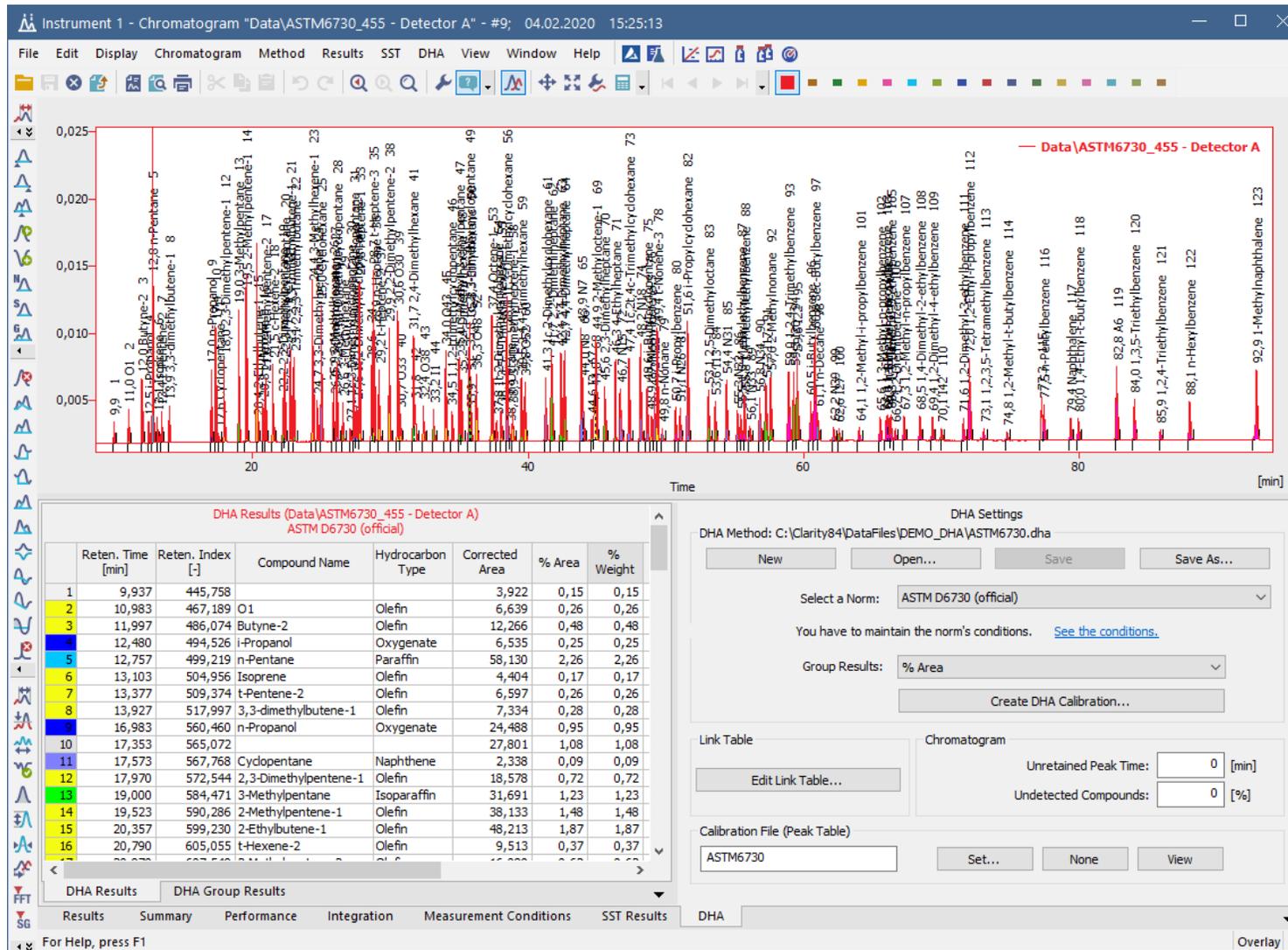


## Development of a new method

- ➔ Possibility to develop a method at customer's side and implement to Clarity
  - Method specific to laboratory instrumentation
  - Example of cooperation:
  - ASTM D-6730 / Comply method by DANI (p/n A331 only)



# DHA → CHROMATOGRAM WINDOW



➔ DHA tab for specific DHA result calculations



DHA Settings

DHA Method: C:\Clarity84\DataFiles\DEMO\_DHA\ASTM6730.dha

Select a Norm:  ▼

You have to maintain the norm's conditions. [See the conditions.](#)

Group Results:  ▼

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Link Table Chromatogram

Unretained Peak Time:  [min]

Undetected Compounds:  [%]

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Calibration File (Peak Table)

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DHA Overlay

- DHA Settings is located on the DHA tab
- Create DHA Calibration
- Display DHA Result from chromatogram
- Edit Link Table: custom compound names



DHA Results (Data\ASTM6730\_455 - Detector A)  
ASTM D6730 (official)

	Reten. Time [min]	Reten. Index [-]	Compound Name	Hydrocarbon Type	Corrected Area	% Area	% Weight	% Volume
1	9,937	445,758			3,922	0,15	0,15	0,00
2	10,983	467,189	O1	Olefin	6,639	0,26	0,26	0,32
3	11,997	486,074	Butyne-2	Olefin	12,266	0,48	0,48	0,54
4	12,480	494,526	i-Propanol	Oxygenate	6,535	0,25	0,25	0,25
5	12,757	499,219	n-Pentane	Paraffin	58,130	2,26	2,26	2,83
6	13,103	504,956	Isoprene	Olefin	4,404	0,17	0,17	0,20
7	13,377	509,374	t-Pentene-2	Olefin	6,597	0,26	0,26	0,31
8	13,927	517,997	3,3-dimethylbutene-1	Olefin	7,334	0,28	0,28	0,34
9	16,983	560,460	n-Propanol	Oxygenate	24,488	0,95	0,95	0,93
10	17,353	565,072			27,801	1,08	1,08	0,00
11	17,573	567,768	Cyclopentane	Naphthene	2,338	0,09	0,09	0,10
12	17,970	572,544	2,3-Dimethylpentene-1	Olefin	18,578	0,72	0,72	0,83
13	19,000	584,471	3-Methylpentane	Isoparaffin	31,691	1,23	1,23	1,45
14	19,523	590,286	2-Methylpentene-1	Olefin	38,133	1,48	1,48	1,70
15	20,357	599,230	2-Ethylbutene-1	Olefin	48,213	1,87	1,87	2,11
16	20,790	605,055	t-Hexene-2	Olefin	9,513	0,37	0,37	0,42
17	20,970	607,549	2-Methylpentene-2	Olefin	16,080	0,62	0,62	0,71
18	21,487	614,502	2-Hexene-2	Olefin	20,000	0,78	0,78	0,88

DHA Results    DHA Group Results

Results    Summary    Performance    Integration    Measurement Conditions    SST Results    DHA

For Help, press F1

- Shows the calculated results
- DHA Method and DHA Calibration from Chromatogram must match with previous DHA Settings



DHA Group Results (Data\ASTM6730\_455 - Detector A)  
ASTM D6730 (official) % Area

Carbon No.	Paraffins	Isoparaffins	Aromatics	Naphthenes	Olefins	Oxygenates	Total
1	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2	0,00	0,00	0,00	0,00	0,00	0,00	0,00
3	0,00	0,00	0,00	0,00	0,00	1,20	1,20
4	0,00	0,00	0,00	0,00	0,48	0,00	0,48
5	2,26	0,00	0,00	0,09	0,43	0,00	2,78
6	0,00	1,68	0,00	2,24	5,41	0,00	9,33
7	1,26	2,94	0,00	2,35	9,32	0,00	15,87
8	0,20	5,16	0,48	4,30	1,69	0,00	11,84
9	0,19	7,32	2,53	3,94	4,75	0,00	18,73
10	0,48	1,85	6,91	0,00	0,00	0,00	9,25
11	0,00	0,00	3,23	0,00	0,00	0,00	3,23
12	0,00	0,00	1,88	0,00	0,00	0,00	1,88
13	0,00	0,00	0,00	0,00	0,00	0,00	0,00
14	0,00	0,00	0,00	0,00	0,00	0,00	0,00
15	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Total	4,40	18,97	15,03	12,92	22,07	1,20	74,59

DHA Results | DHA Group Results

Results | Summary | Performance | Integration | Measurement Conditions | SST Results | DHA

For Help, press F1

- Display Group Results (PIONA, PONA)
- Units according to DHA Settings – Corrected Area, % Area, % Weight or % Volume
- Selected units are displayed in the table header



Create DHA Calibration ✕

Enter all known retention times of n-Paraffins. The missing retention times will be interpolated or extrapolated.

	Paraffin	Ret. Time [min]
C1	Methane	
C2	Ethane	
C3	Propane	
C4	n-Butane	
C5	n-Pentane	12,803
C6	n-Hexane	20,430
C7	n-Heptane	28,863
C8	n-Octane	38,673
C9	n-Nonane	49,657
C10	n-Decane	61,087
C11	n-Undecane	72,323
C12	n-Dodecane	83,057
C13	n-Tridecane	93,147
C14	n-Tetradecane	102,747
C15	n-Pentadecane	111,750

- DHA Settings
- Used the button *Create DHA Calibration*
- Manually enter the
- previously measured C1...C4



**Export Data**

**Export Content**

- Result Table
  - In Fixed Format
- Special Results
- Summary Table
- Column
- Moments
- Calculation Parameters
- Chromatogram
- Chromatogram Header
  - NGA Amounts
  - NGA Summary
- DHA Results
- DHA Group Results

Table Headers  
 Full Format

File Name: C:\Clarity84\DataFiles\DEMO\_DHA\

Export

**Chromatogram**

- All Data
- Displayed Data
- X Axis
- Time Step: 0 min
- Append
- Character Encoding: ANSI

**Text Format**

- Fixed Width
- Delimited by:  
<TAB>
- Decimal Separator: <Window's Locale>

**Export to**

- Clipboard
- Text File
- Excel
- dBase File

➔ Options for DHA appear in the Report Setup and in the Export Data dialogs

**Report Setup Chromatogram**

**Page Setup**

- Lab. Header
- Report Header
- Method
- Calibration
- Chromatogram
- Results
- Sequence
- SST
- DHA
- Audit & Signatures

**Print**

- Print
- On New Page

**Chromatograms**

- All
- Active Chromatogram
- Only Active Signal

**Print Options**

- Print User Column Formulas

**Results**

- Results
- Group Results
- DHA Method
- Link Table

OK  
Cancel  
Help  
New  
Open...  
Save As...  
Printer...  
Preview...  
Print...  
Print To PDF...  
Send PDF



**...THANK YOU FOR YOUR TIME**



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