QuantityWare

ISO 91:2017

Consulting Paper

Guidance for QuantityWare BCP Implementations

What is the impact of ISO 91:2017 and how do I check that my template or production conversion groups comply with ISO 91:2017?

25.02.2021

Notes

Action:	Date:	Comment:
First published	19.05.2017	
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Layout revision	25.02.2021	

Contents

BCP ISO 91:2017 Compliance Overview

In May 2017 ISO, the International Organization for Standardization, published ISO 91:2017:

"Petroleum and related products - Temperature and pressure volume correction factors (petroleum measurement tables) and standard reference conditions"

This new measurement standard release represents a major step forward in international standardization and harmonization of petroleum measurement standards for the global oil industries. With this paper, QuantityWare provides guidance to its customers and certified BCP consultants as to how to perform a compliance analysis of QuantityWare BCP (Bulk Calculations - Petroleum) template and production conversion groups with respect to ISO 91:2017.

> ⚠ ***Summary:*** *Since 2011, all QuantityWare BCP (Bulk Calculations - Petroleum) customers have had access to ISO 91:2017 compliant measurement standard implementations via 82 BCP MQCI template conversion groups (BCS 3.0). Thus, an easy transition to ISO 91:2017 calculations is available or has already been made during your BCP implementation project.*

After a summary of the overall aim of this new standard, detailed guidance is given in **Chapter 1** as to how certified BCP consultants and BCP customers can select ISO 91:2017-compliant template conversion groups. **Chapter 2** describes how production conversion groups can be checked for ISO 91:2017 compliance.

> ⚠ *QuantityWare strongly recommends that you purchase your own licensed copy of ISO 91:2017 to access all vital details defined in ISO 91:2017. The information concerning ISO 91:2017 that is provided in this consulting paper is freely available at https://www.iso.org/obp/ui/#iso:std:iso:91:ed-1:v1:en (accessed at 5/17/2017 - 18:00 UTC)*

ISO 91:2017 Summary

As stated in ISO 91:2017, ISO 91:2017 cancels and replaces ISO 91-1:1992, ISO 91-2:1991, ISO 9770:1989, and ISO 5024:1999.

What does this mean?

ISO 91:2017 globally advises that new implementations of quantity conversion calculations

- for determination of Volume Correction Factors (VCF/CTPL: Temperature and Pressure Corrections)
- and for Density/Weight/Volume Intraconversion

shall be based on the latest API MPMS (American Petroleum Institute Manual of Petroleum Measurement Standards) versions.

This recommendation is made for crude oil, petroleum products, lubricating oils and special application products, as well as LPG (Liquefied Petroleum Gas) and NGL (Natural Gas Liquids).

Furthermore, a recommendation is given in ISO 91:2017 as to when new applications shall refer to this new ISO standard and whether existing applications are considered compliant with ISO 91:2017 (if they are compliant with the now cancelled ISO 91-1:1992 or ISO 91-2:1991).

For LPG and NGL there are many historical standard versions still in use globally, for which a differing compliance status is defined.

ISO 91:2017 also contains the definition of the measurement standard reference conditions.

Ultimately, the use of any measurement standard is voluntarily and needs to be agreed on by the parties involved in business transactions. Varying national legal requirements need to be considered too. For this reason, QuantityWare BCP provides a wealth of measurement standard implementations based on national and international measurement standards, including different historical versions (e.g. ISO 91-1:1992 and ISO 91-2:1991).

Guided by certified BCP consultants, customers can select which standard versions are to be applied to conversion groups based on such agreements and regulations during their implementation projects.

Chapter 1: ISO 91:2017 Template Conversion Group Determination

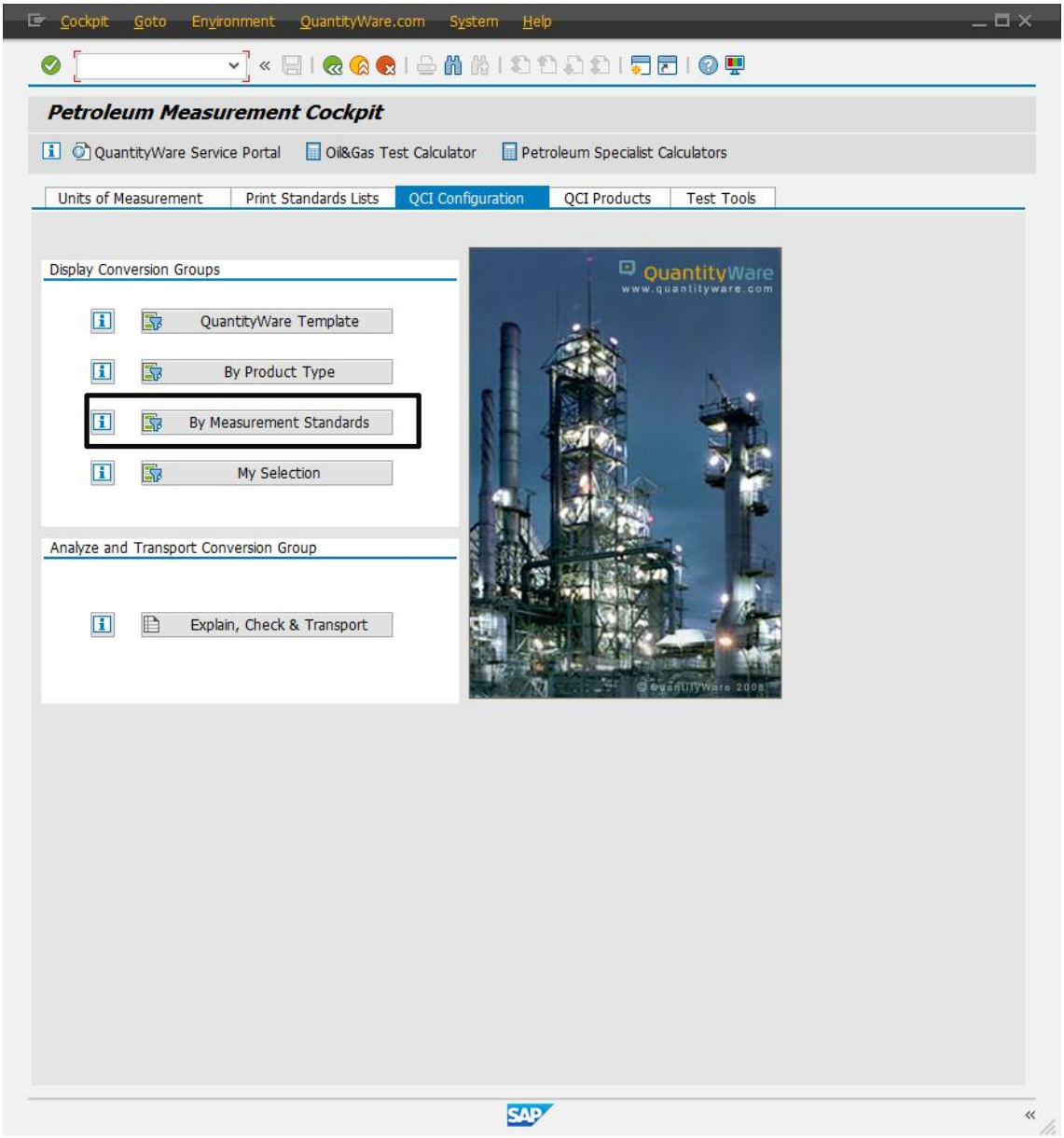
ISO 91:2017 lists the following normative references:

- CTPL Measurement Standards:
  - Crude oil & products:
    - API Manual of Petroleum Measurement Standards (MPMS) Chapter 11.1–2004/Adjunct to ASTM D1250-042/Adjunct to IP 200/04, Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils/Addendum 1-2007
  - NGL/LPG:
    - API MPMS Chapter 11.2.2-1986, Compressibility Factors for Hydrocarbons: 0.350–0.637 Relative Density (60°F/60°F) and –50 °F to 140 °F Metering Temperature/Errata June 1996
    - API MPMS Chapter 11.2.2M-1986, Compressibility Factors for Hydrocarbons: 350–637 Kilograms per Cubic Metre Density (15 °C) and –46 °C to 60 °C Metering Temperature
    - API MPMS Chapter 11.2.4-2007/GPA Technical Publication TP-27-2007, Temperature Correction for the Volume of NGL and LPG, Tables 23E, 24E, 53E, 54E, 59E, and 60E

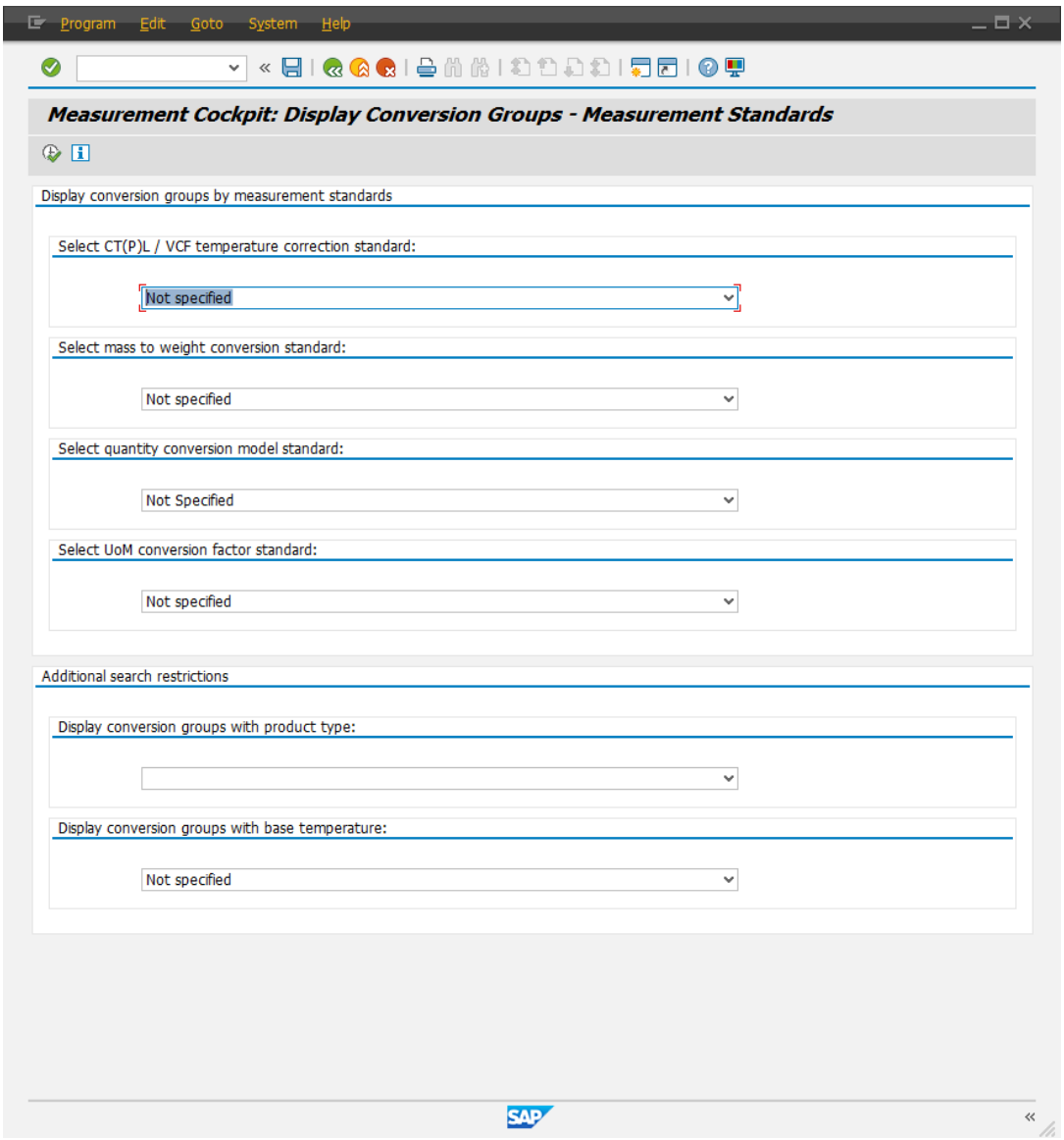
- Density/Weight/Volume Intraconversion Standards
  - All products:
    - API MPMS Chapter 11.5 Part 1-2009/Adjunct to ASTM D1250-08/Adjunct to IP 200/08, Density/Weight/Volume Intraconversion — Part 1: Conversions of API gravity at 60 °F
    - API MPMS Chapter 11.5 Part 2-2009/Adjunct to ASTM D1250-08/Adjunct to IP 200/08, Density/Weight/Volume Intraconversion — Part 2: Conversions for Relative Density (60/60 °F)
    - API MPMS Chapter 11.5 Part 3-2009/Adjunct to ASTM D1250-08/Adjunct to IP 200/08, Density/Weight/Volume Intraconversion— Part 3: Conversions for Absolute Density at 15 °C

With this information at hand, you easily select ISO 91: 2017-compliant QuantityWare BCP template conversion groups:

First, launch the Petroleum Measurement Cockpit (PMC) and navigate to tab strip "QCI Configuration":

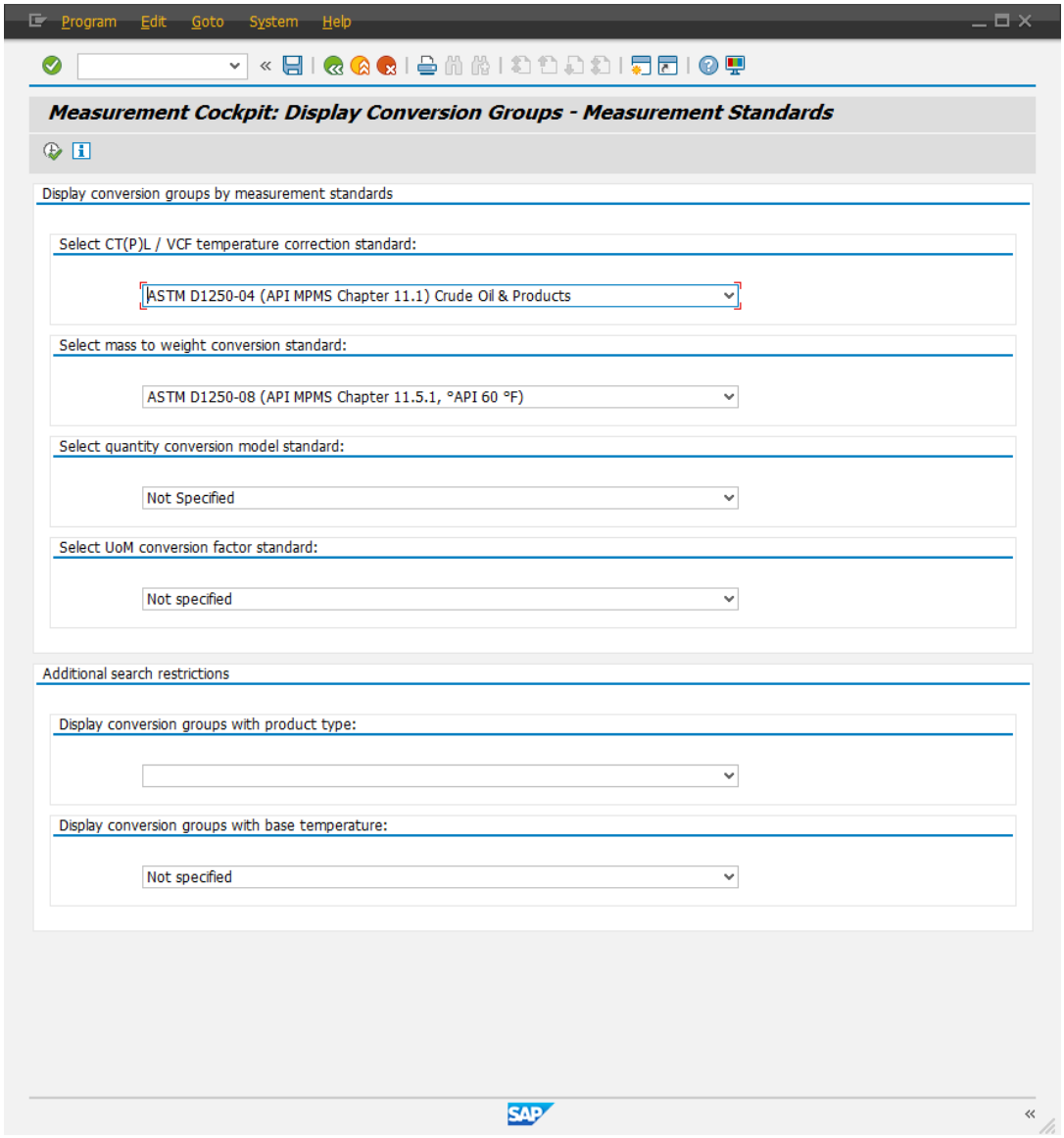


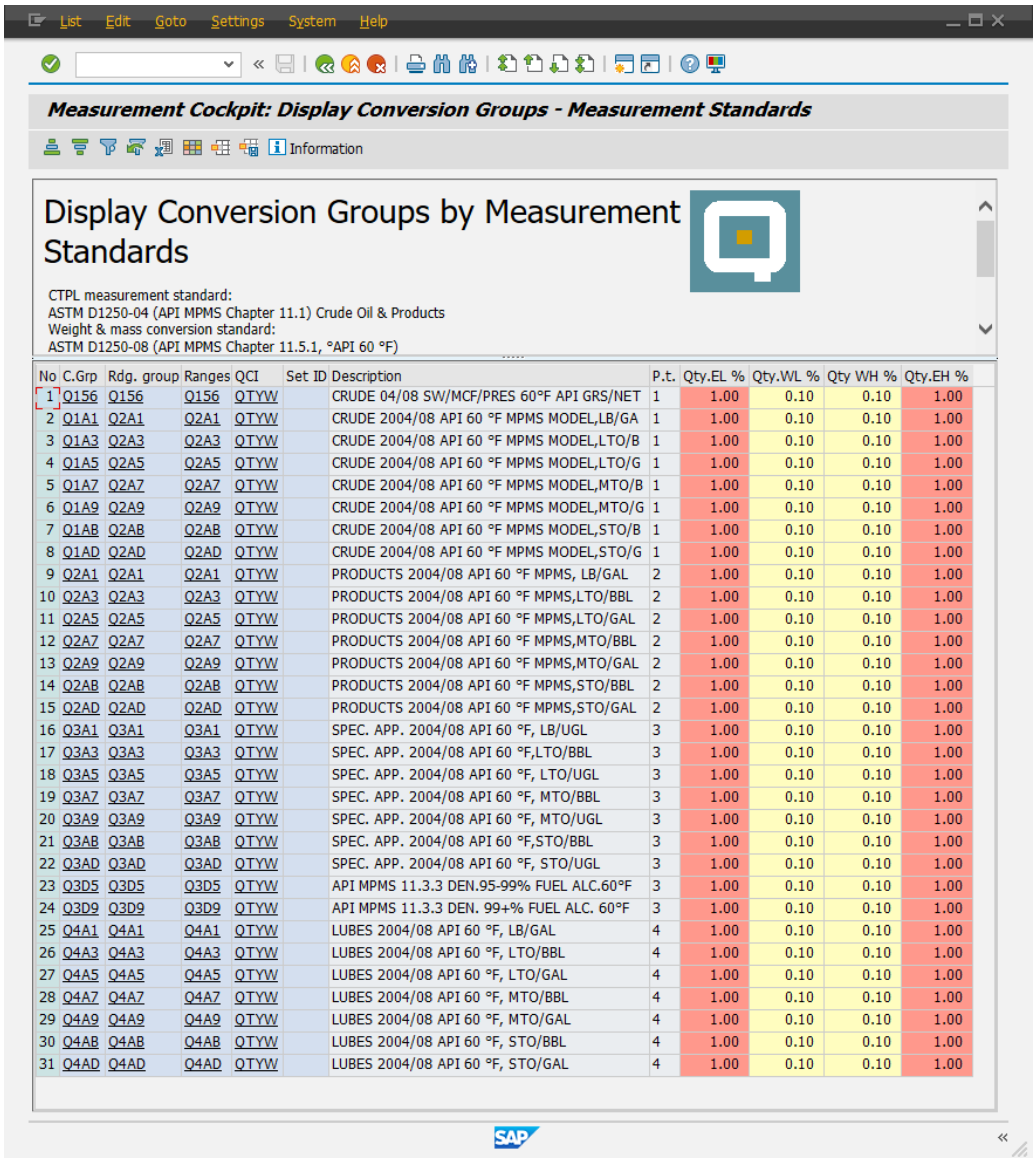
Now select "By Measurement Standards":



> ⚠ *To display ISO 91:2017 compliant conversion groups, enter the API MPMS CTPL standard and the API MPMS mass to weight conversion standard listed as normative reference:*

Display all ISO 91:2017-compliant Template Conversion Groups for **Crude Oil, Petroleum Products, Lubricating Oils and Special Applications** - **API Gravity at 60 °F**:



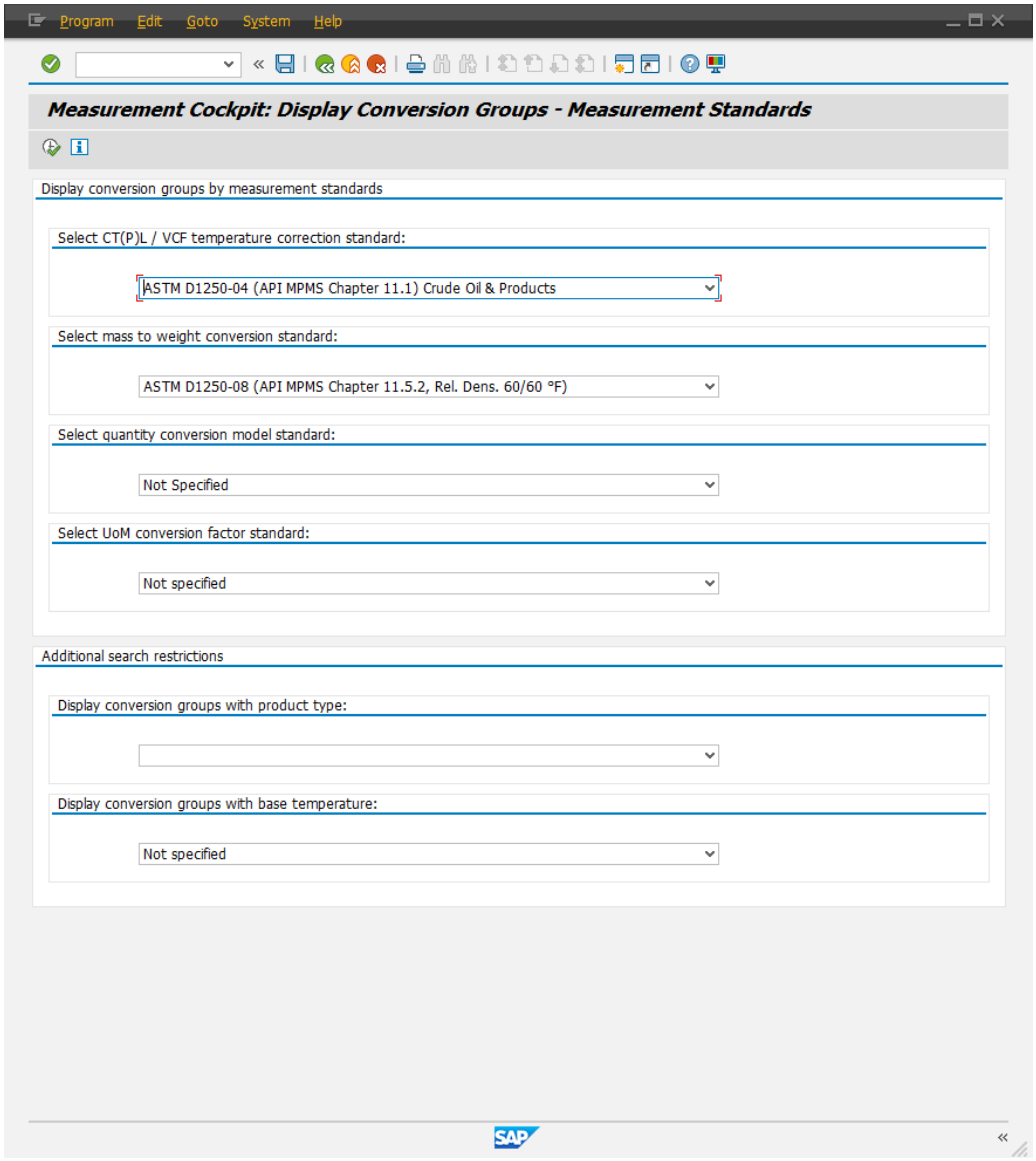


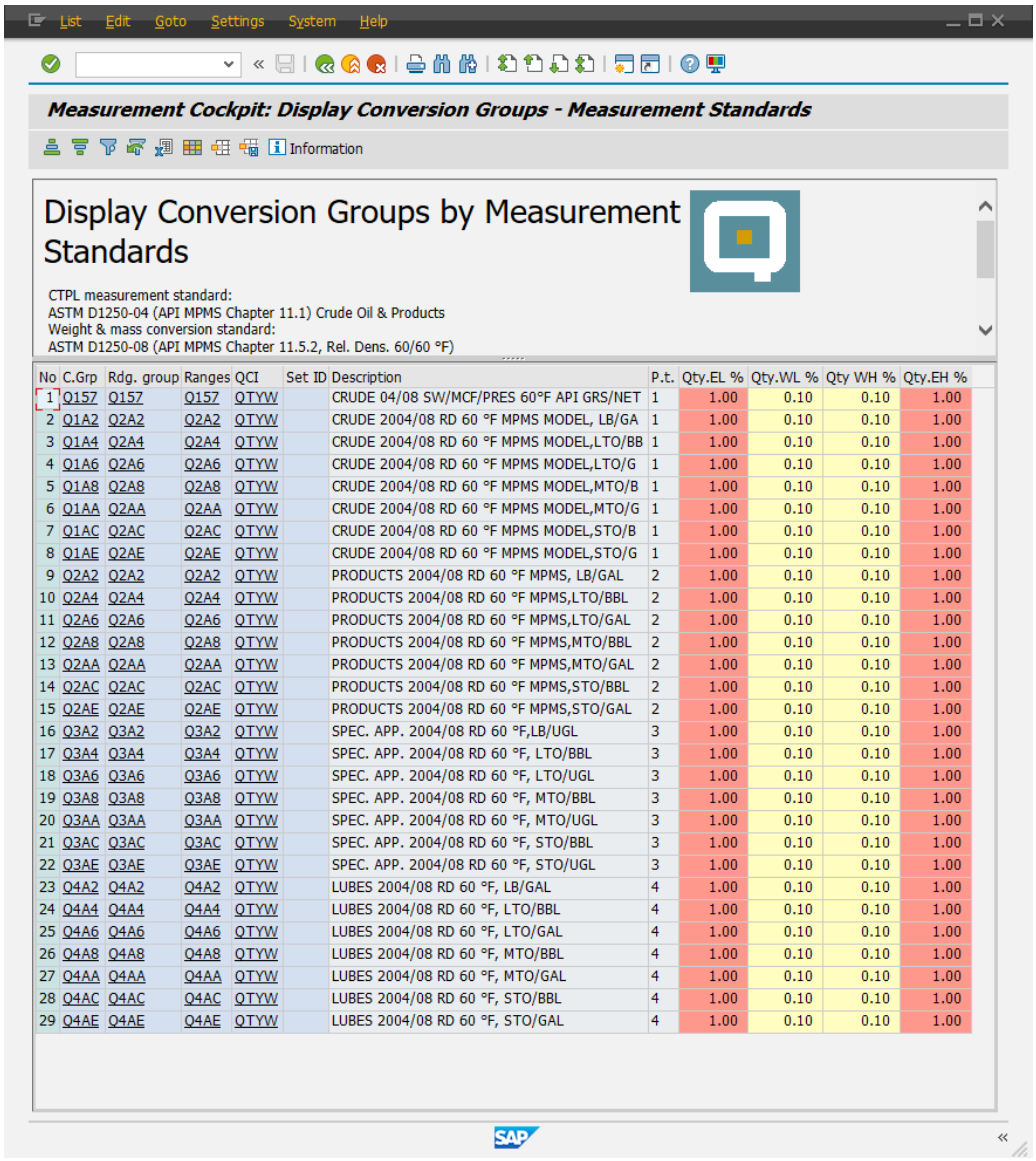
Display Conversion Groups by Measurement Standards

CTPL measurement standard:
ASTM D1250-04 (API MPMS Chapter 11.1) Crude Oil & Products
Weight & mass conversion standard:
ASTM D1250-08 (API MPMS Chapter 11.5.1, °API 60 °F)

No	C.Grp	Rdg. group	Ranges	QCI	Set ID	Description	P.t.	Qty.EL %	Qty.WL %	Qty WH %	Qty.EH %
1	Q156	Q156	Q156	QTYW		CRUDE 04/08 SW/MCF/PRES 60°F API GRS/NET	1	1.00	0.10	0.10	1.00
2	Q1A1	Q2A1	Q2A1	QTYW		CRUDE 2004/08 API 60 °F MPMS MODEL,LB/GA	1	1.00	0.10	0.10	1.00
3	Q1A3	Q2A3	Q2A3	QTYW		CRUDE 2004/08 API 60 °F MPMS MODEL,LTO/B	1	1.00	0.10	0.10	1.00
4	Q1A5	Q2A5	Q2A5	QTYW		CRUDE 2004/08 API 60 °F MPMS MODEL,LTO/G	1	1.00	0.10	0.10	1.00
5	Q1A7	Q2A7	Q2A7	QTYW		CRUDE 2004/08 API 60 °F MPMS MODEL,MTO/B	1	1.00	0.10	0.10	1.00
6	Q1A9	Q2A9	Q2A9	QTYW		CRUDE 2004/08 API 60 °F MPMS MODEL,MTO/G	1	1.00	0.10	0.10	1.00
7	Q1AB	Q2AB	Q2AB	QTYW		CRUDE 2004/08 API 60 °F MPMS MODEL,STO/B	1	1.00	0.10	0.10	1.00
8	Q1AD	Q2AD	Q2AD	QTYW		CRUDE 2004/08 API 60 °F MPMS MODEL,STO/G	1	1.00	0.10	0.10	1.00
9	Q2A1	Q2A1	Q2A1	QTYW		PRODUCTS 2004/08 API 60 °F MPMS, LB/GAL	2	1.00	0.10	0.10	1.00
10	Q2A3	Q2A3	Q2A3	QTYW		PRODUCTS 2004/08 API 60 °F MPMS,LTO/BBL	2	1.00	0.10	0.10	1.00
11	Q2A5	Q2A5	Q2A5	QTYW		PRODUCTS 2004/08 API 60 °F MPMS,LTO/GAL	2	1.00	0.10	0.10	1.00
12	Q2A7	Q2A7	Q2A7	QTYW		PRODUCTS 2004/08 API 60 °F MPMS,MTO/BBL	2	1.00	0.10	0.10	1.00
13	Q2A9	Q2A9	Q2A9	QTYW		PRODUCTS 2004/08 API 60 °F MPMS,MTO/GAL	2	1.00	0.10	0.10	1.00
14	Q2AB	Q2AB	Q2AB	QTYW		PRODUCTS 2004/08 API 60 °F MPMS,STO/BBL	2	1.00	0.10	0.10	1.00
15	Q2AD	Q2AD	Q2AD	QTYW		PRODUCTS 2004/08 API 60 °F MPMS,STO/GAL	2	1.00	0.10	0.10	1.00
16	Q3A1	Q3A1	Q3A1	QTYW		SPEC. APP. 2004/08 API 60 °F, LB/UGL	3	1.00	0.10	0.10	1.00
17	Q3A3	Q3A3	Q3A3	QTYW		SPEC. APP. 2004/08 API 60 °F,LTO/BBL	3	1.00	0.10	0.10	1.00
18	Q3A5	Q3A5	Q3A5	QTYW		SPEC. APP. 2004/08 API 60 °F, LTO/UGL	3	1.00	0.10	0.10	1.00
19	Q3A7	Q3A7	Q3A7	QTYW		SPEC. APP. 2004/08 API 60 °F, MTO/BBL	3	1.00	0.10	0.10	1.00
20	Q3A9	Q3A9	Q3A9	QTYW		SPEC. APP. 2004/08 API 60 °F, MTO/UGL	3	1.00	0.10	0.10	1.00
21	Q3AB	Q3AB	Q3AB	QTYW		SPEC. APP. 2004/08 API 60 °F,STO/BBL	3	1.00	0.10	0.10	1.00
22	Q3AD	Q3AD	Q3AD	QTYW		SPEC. APP. 2004/08 API 60 °F, STO/UGL	3	1.00	0.10	0.10	1.00
23	Q3D5	Q3D5	Q3D5	QTYW		API MPMS 11.3.3 DEN.95-99% FUEL ALC.60°F	3	1.00	0.10	0.10	1.00
24	Q3D9	Q3D9	Q3D9	QTYW		API MPMS 11.3.3 DEN. 99+% FUEL ALC. 60°F	3	1.00	0.10	0.10	1.00
25	Q4A1	Q4A1	Q4A1	QTYW		LUBES 2004/08 API 60 °F, LB/GAL	4	1.00	0.10	0.10	1.00
26	Q4A3	Q4A3	Q4A3	QTYW		LUBES 2004/08 API 60 °F, LTO/BBL	4	1.00	0.10	0.10	1.00
27	Q4A5	Q4A5	Q4A5	QTYW		LUBES 2004/08 API 60 °F, LTO/GAL	4	1.00	0.10	0.10	1.00
28	Q4A7	Q4A7	Q4A7	QTYW		LUBES 2004/08 API 60 °F, MTO/BBL	4	1.00	0.10	0.10	1.00
29	Q4A9	Q4A9	Q4A9	QTYW		LUBES 2004/08 API 60 °F, MTO/GAL	4	1.00	0.10	0.10	1.00
30	Q4AB	Q4AB	Q4AB	QTYW		LUBES 2004/08 API 60 °F, STO/BBL	4	1.00	0.10	0.10	1.00
31	Q4AD	Q4AD	Q4AD	QTYW		LUBES 2004/08 API 60 °F, STO/GAL	4	1.00	0.10	0.10	1.00

Display all ISO 91:2017-compliant Template Conversion Groups for **Crude Oil, Petroleum Products, Lubricating Oils and Special Applications - Relative Density 60/60 °F**:



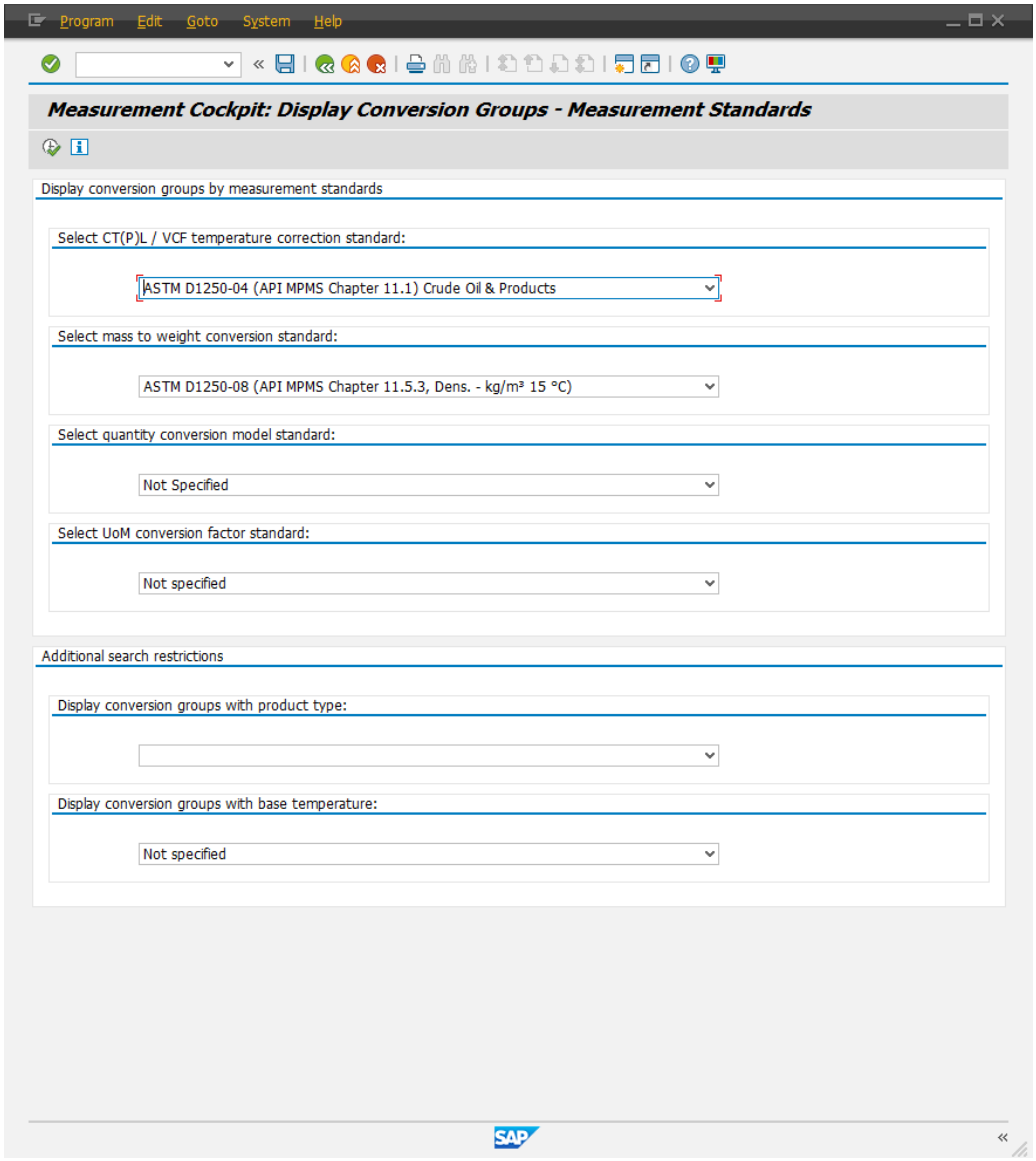


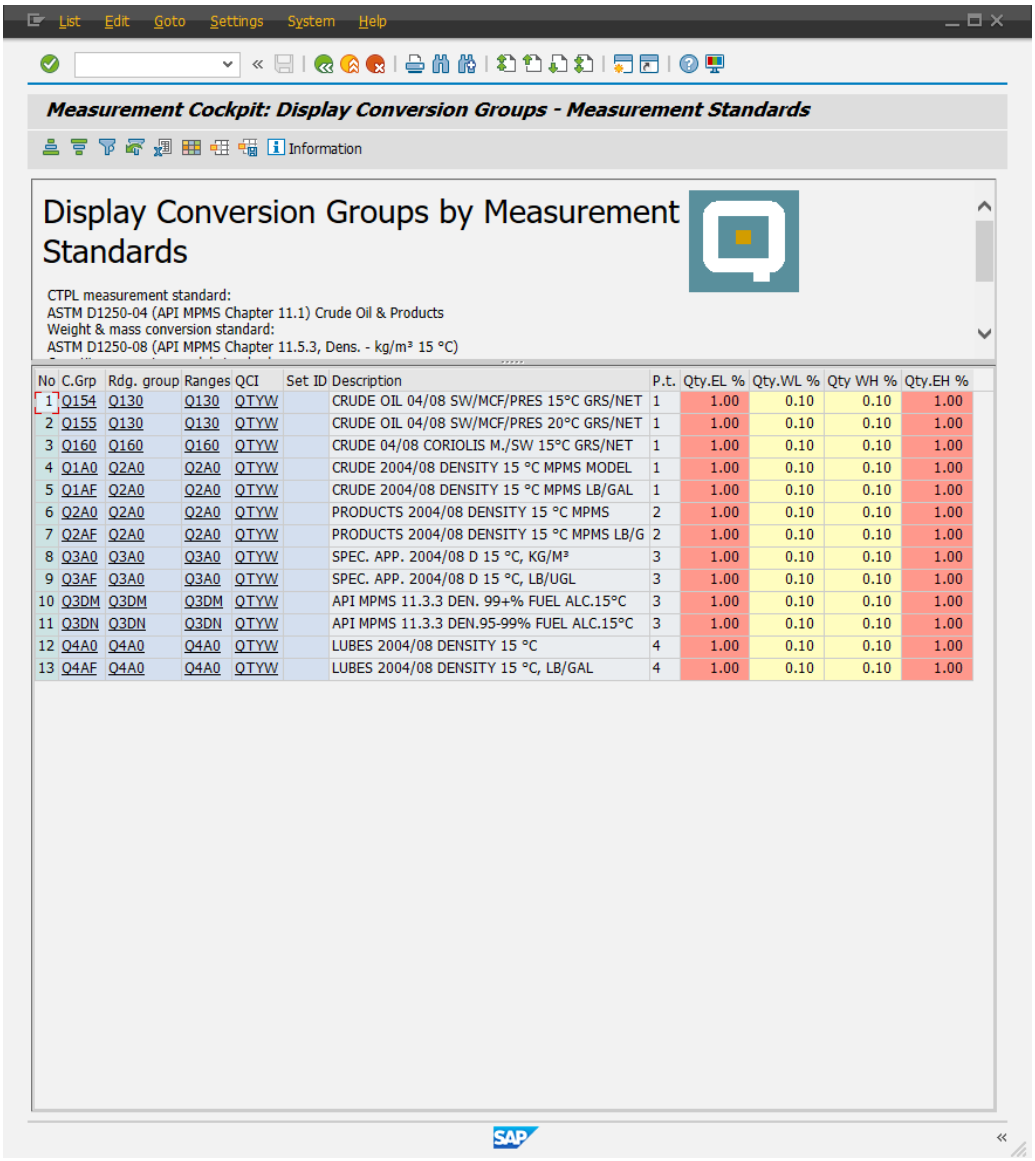
Display Conversion Groups by Measurement Standards

CTPL measurement standard:
ASTM D1250-04 (API MPMS Chapter 11.1) Crude Oil & Products
Weight & mass conversion standard:
ASTM D1250-08 (API MPMS Chapter 11.5.2, Rel. Dens. 60/60 °F)

No	C.Grp	Rdg. group	Ranges	QCI	Set ID	Description	P.t.	Qty.EL %	Qty.WL %	Qty WH %	Qty.EH %
1	Q157	Q157	Q157	QTYW		CRUDE 04/08 SW/MCF/PRES 60°F API GRS/NET	1	1.00	0.10	0.10	1.00
2	Q1A2	Q2A2	Q2A2	QTYW		CRUDE 2004/08 RD 60 °F MPMS MODEL, LB/GA	1	1.00	0.10	0.10	1.00
3	Q1A4	Q2A4	Q2A4	QTYW		CRUDE 2004/08 RD 60 °F MPMS MODEL,LTO/BB	1	1.00	0.10	0.10	1.00
4	Q1A6	Q2A6	Q2A6	QTYW		CRUDE 2004/08 RD 60 °F MPMS MODEL,LTO/G	1	1.00	0.10	0.10	1.00
5	Q1A8	Q2A8	Q2A8	QTYW		CRUDE 2004/08 RD 60 °F MPMS MODEL,MTO/B	1	1.00	0.10	0.10	1.00
6	Q1AA	Q2AA	Q2AA	QTYW		CRUDE 2004/08 RD 60 °F MPMS MODEL,MTO/G	1	1.00	0.10	0.10	1.00
7	Q1AC	Q2AC	Q2AC	QTYW		CRUDE 2004/08 RD 60 °F MPMS MODEL,STO/B	1	1.00	0.10	0.10	1.00
8	Q1AE	Q2AE	Q2AE	QTYW		CRUDE 2004/08 RD 60 °F MPMS MODEL,STO/G	1	1.00	0.10	0.10	1.00
9	Q2A2	Q2A2	Q2A2	QTYW		PRODUCTS 2004/08 RD 60 °F MPMS, LB/GAL	2	1.00	0.10	0.10	1.00
10	Q2A4	Q2A4	Q2A4	QTYW		PRODUCTS 2004/08 RD 60 °F MPMS,LTO/BBL	2	1.00	0.10	0.10	1.00
11	Q2A6	Q2A6	Q2A6	QTYW		PRODUCTS 2004/08 RD 60 °F MPMS,LTO/GAL	2	1.00	0.10	0.10	1.00
12	Q2A8	Q2A8	Q2A8	QTYW		PRODUCTS 2004/08 RD 60 °F MPMS,MTO/BBL	2	1.00	0.10	0.10	1.00
13	Q2AA	Q2AA	Q2AA	QTYW		PRODUCTS 2004/08 RD 60 °F MPMS,MTO/GAL	2	1.00	0.10	0.10	1.00
14	Q2AC	Q2AC	Q2AC	QTYW		PRODUCTS 2004/08 RD 60 °F MPMS,STO/BBL	2	1.00	0.10	0.10	1.00
15	Q2AE	Q2AE	Q2AE	QTYW		PRODUCTS 2004/08 RD 60 °F MPMS,STO/GAL	2	1.00	0.10	0.10	1.00
16	Q3A2	Q3A2	Q3A2	QTYW		SPEC. APP. 2004/08 RD 60 °F,LB/UGL	3	1.00	0.10	0.10	1.00
17	Q3A4	Q3A4	Q3A4	QTYW		SPEC. APP. 2004/08 RD 60 °F, LTO/BBL	3	1.00	0.10	0.10	1.00
18	Q3A6	Q3A6	Q3A6	QTYW		SPEC. APP. 2004/08 RD 60 °F, LTO/UGL	3	1.00	0.10	0.10	1.00
19	Q3A8	Q3A8	Q3A8	QTYW		SPEC. APP. 2004/08 RD 60 °F, MTO/BBL	3	1.00	0.10	0.10	1.00
20	Q3AA	Q3AA	Q3AA	QTYW		SPEC. APP. 2004/08 RD 60 °F, MTO/UGL	3	1.00	0.10	0.10	1.00
21	Q3AC	Q3AC	Q3AC	QTYW		SPEC. APP. 2004/08 RD 60 °F, STO/BBL	3	1.00	0.10	0.10	1.00
22	Q3AE	Q3AE	Q3AE	QTYW		SPEC. APP. 2004/08 RD 60 °F, STO/UGL	3	1.00	0.10	0.10	1.00
23	Q4A2	Q4A2	Q4A2	QTYW		LUBES 2004/08 RD 60 °F, LB/GAL	4	1.00	0.10	0.10	1.00
24	Q4A4	Q4A4	Q4A4	QTYW		LUBES 2004/08 RD 60 °F, LTO/BBL	4	1.00	0.10	0.10	1.00
25	Q4A6	Q4A6	Q4A6	QTYW		LUBES 2004/08 RD 60 °F, LTO/GAL	4	1.00	0.10	0.10	1.00
26	Q4A8	Q4A8	Q4A8	QTYW		LUBES 2004/08 RD 60 °F, MTO/BBL	4	1.00	0.10	0.10	1.00
27	Q4AA	Q4AA	Q4AA	QTYW		LUBES 2004/08 RD 60 °F, MTO/GAL	4	1.00	0.10	0.10	1.00
28	Q4AC	Q4AC	Q4AC	QTYW		LUBES 2004/08 RD 60 °F, STO/BBL	4	1.00	0.10	0.10	1.00
29	Q4AE	Q4AE	Q4AE	QTYW		LUBES 2004/08 RD 60 °F, STO/GAL	4	1.00	0.10	0.10	1.00

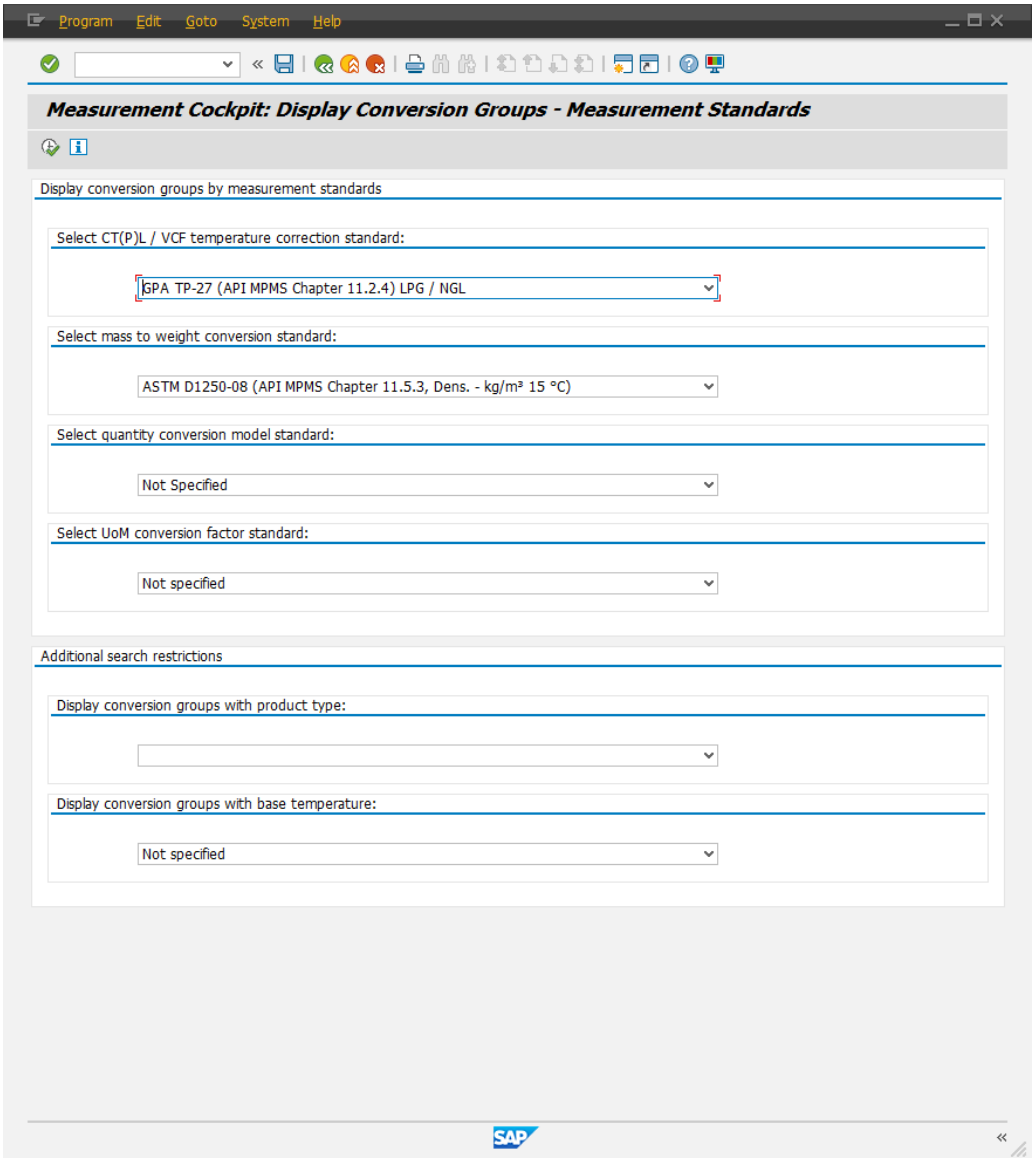
Display all ISO 91:2017-compliant Template Conversion Groups **for Crude Oil, Petroleum Products, Lubricating Oils and Special Applications - Absolute Density at 15 °C**:

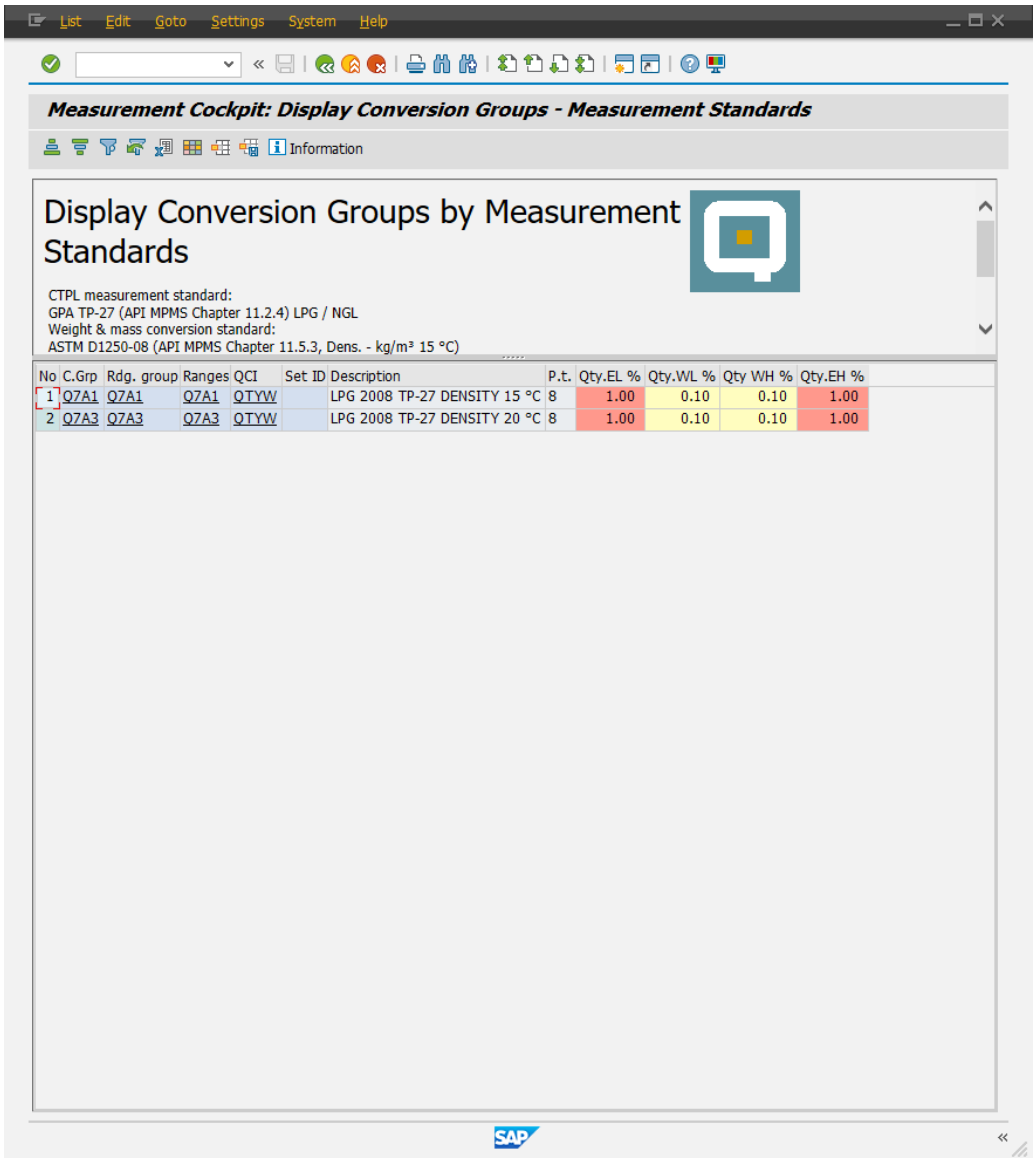




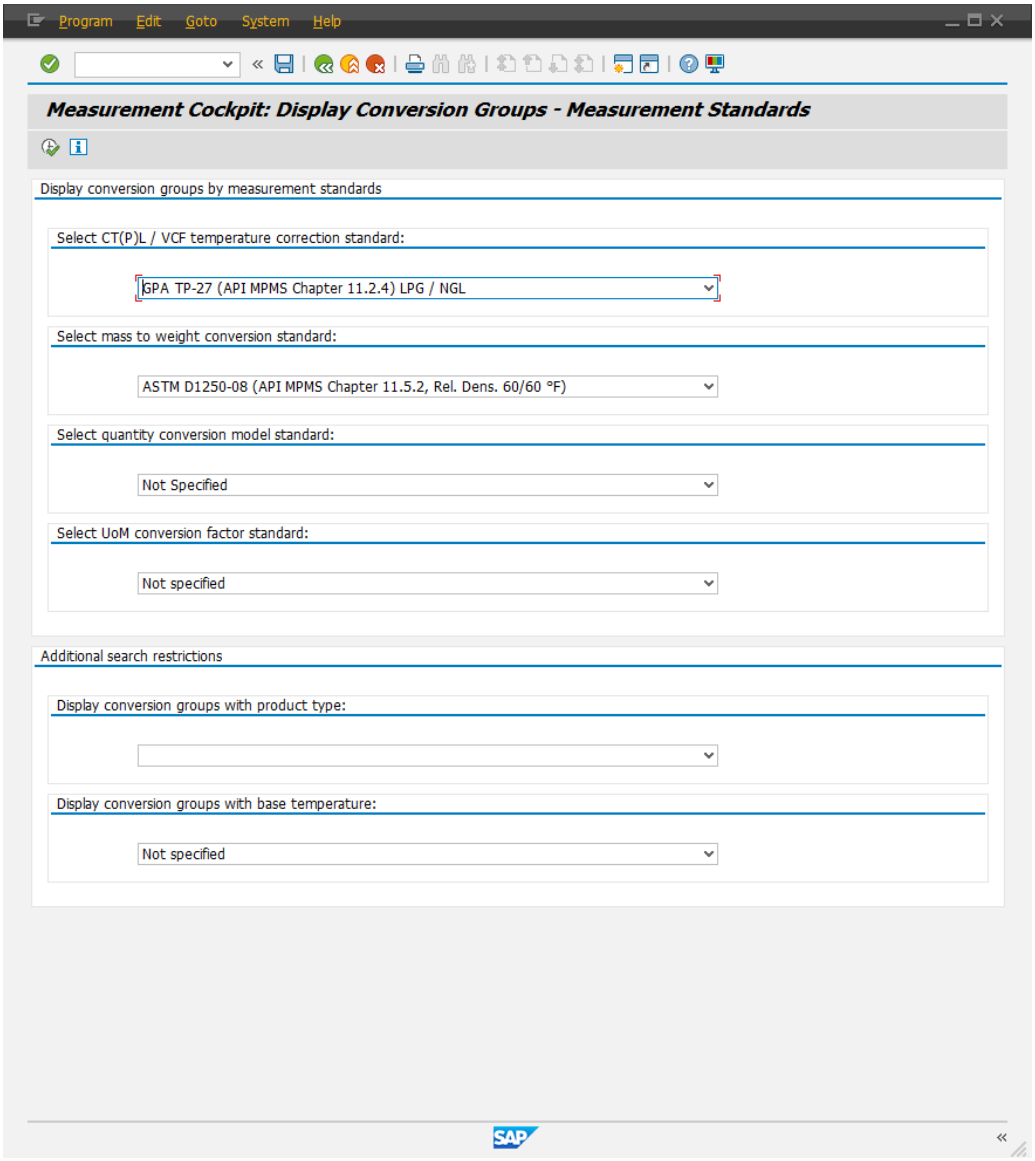
No	C.Grp	Rdg. group	Ranges	QCI	Set ID	Description	P.t.	Qty.EL %	Qty.WL %	Qty WH %	Qty.EH %
1	Q154	Q130	Q130	QTYW		CRUDE OIL 04/08 SW/MCF/PRES 15°C GRS/NET	1	1.00	0.10	0.10	1.00
2	Q155	Q130	Q130	QTYW		CRUDE OIL 04/08 SW/MCF/PRES 20°C GRS/NET	1	1.00	0.10	0.10	1.00
3	Q160	Q160	Q160	QTYW		CRUDE 04/08 CORIOLIS M./SW 15°C GRS/NET	1	1.00	0.10	0.10	1.00
4	Q1A0	Q2A0	Q2A0	QTYW		CRUDE 2004/08 DENSITY 15 °C MPMS MODEL	1	1.00	0.10	0.10	1.00
5	Q1AF	Q2A0	Q2A0	QTYW		CRUDE 2004/08 DENSITY 15 °C MPMS LB/GAL	1	1.00	0.10	0.10	1.00
6	Q2A0	Q2A0	Q2A0	QTYW		PRODUCTS 2004/08 DENSITY 15 °C MPMS	2	1.00	0.10	0.10	1.00
7	Q2AF	Q2A0	Q2A0	QTYW		PRODUCTS 2004/08 DENSITY 15 °C MPMS LB/G	2	1.00	0.10	0.10	1.00
8	Q3A0	Q3A0	Q3A0	QTYW		SPEC. APP. 2004/08 D 15 °C, KG/M³	3	1.00	0.10	0.10	1.00
9	Q3AF	Q3A0	Q3A0	QTYW		SPEC. APP. 2004/08 D 15 °C, LB/UGL	3	1.00	0.10	0.10	1.00
10	Q3DM	Q3DM	Q3DM	QTYW		API MPMS 11.3.3 DEN. 99+% FUEL ALC.15°C	3	1.00	0.10	0.10	1.00
11	Q3DN	Q3DN	Q3DN	QTYW		API MPMS 11.3.3 DEN.95-99% FUEL ALC.15°C	3	1.00	0.10	0.10	1.00
12	Q4A0	Q4A0	Q4A0	QTYW		LUBES 2004/08 DENSITY 15 °C	4	1.00	0.10	0.10	1.00
13	Q4AF	Q4A0	Q4A0	QTYW		LUBES 2004/08 DENSITY 15 °C, LB/GAL	4	1.00	0.10	0.10	1.00

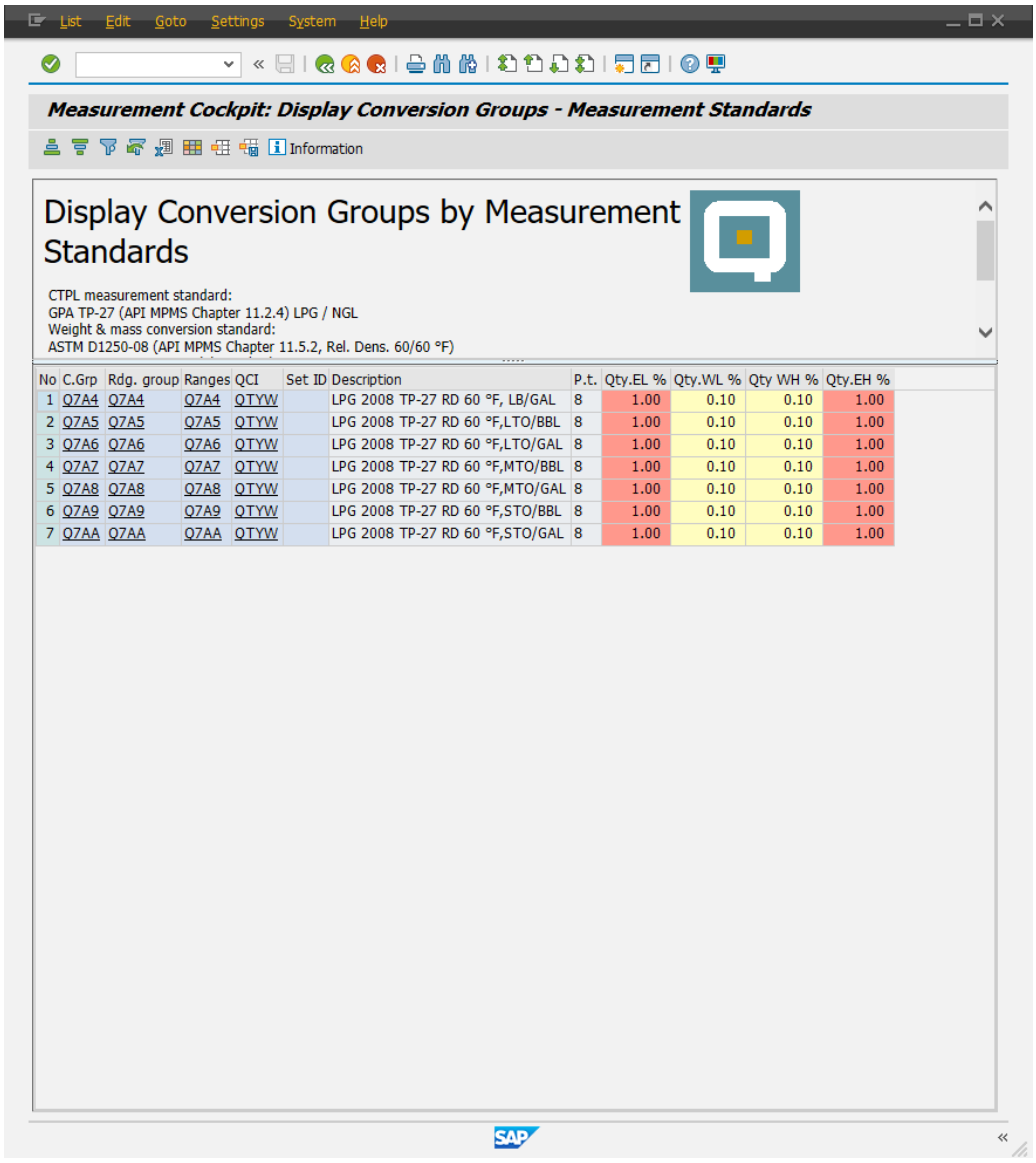
Display all ISO 91:2017-compliant Template Conversion Groups **for LPG/NGL- Absolute Density at 15 °C**:




List Edit Goto Settings System Help
Measurement Cockpit: Display Conversion Groups - Measurement Standards
Information
Display Conversion Groups by Measurement Standards
CTPL measurement standard:
GPA TP-27 (API MPMS Chapter 11.2.4) LPG / NGL
Weight & mass conversion standard:
ASTM D1250-08 (API MPMS Chapter 11.5.3, Dens. - kg/m³ 15 °C)
No C.Grp Rdg. group Ranges QCI Set ID Description P.t. Qty.EL % Qty.WL % Qty WH % Qty.EH %
1 Q7A1 Q7A1 Q7A1 QTYW LPG 2008 TP-27 DENSITY 15 °C 8 1.00 0.10 0.10 1.00
2 Q7A3 Q7A3 Q7A3 QTYW LPG 2008 TP-27 DENSITY 20 °C 8 1.00 0.10 0.10 1.00

Display all ISO 91:2017-compliant Template Conversion Groups **for LPG/NGL- Relative Density 60/60 °F**:





No	C.Grp	Rdg. group	Ranges	QCI	Set ID	Description	P.t.	Qty.EL %	Qty.WL %	Qty WH %	Qty.EH %
1	Q7A4	Q7A4	Q7A4	QTYW		LPG 2008 TP-27 RD 60 °F, LB/GAL	8	1.00	0.10	0.10	1.00
2	Q7A5	Q7A5	Q7A5	QTYW		LPG 2008 TP-27 RD 60 °F,LTO/BBL	8	1.00	0.10	0.10	1.00
3	Q7A6	Q7A6	Q7A6	QTYW		LPG 2008 TP-27 RD 60 °F,LTO/GAL	8	1.00	0.10	0.10	1.00
4	Q7A7	Q7A7	Q7A7	QTYW		LPG 2008 TP-27 RD 60 °F,MTO/BBL	8	1.00	0.10	0.10	1.00
5	Q7A8	Q7A8	Q7A8	QTYW		LPG 2008 TP-27 RD 60 °F,MTO/GAL	8	1.00	0.10	0.10	1.00
6	Q7A9	Q7A9	Q7A9	QTYW		LPG 2008 TP-27 RD 60 °F,STO/BBL	8	1.00	0.10	0.10	1.00
7	Q7AA	Q7AA	Q7AA	QTYW		LPG 2008 TP-27 RD 60 °F,STO/GAL	8	1.00	0.10	0.10	1.00

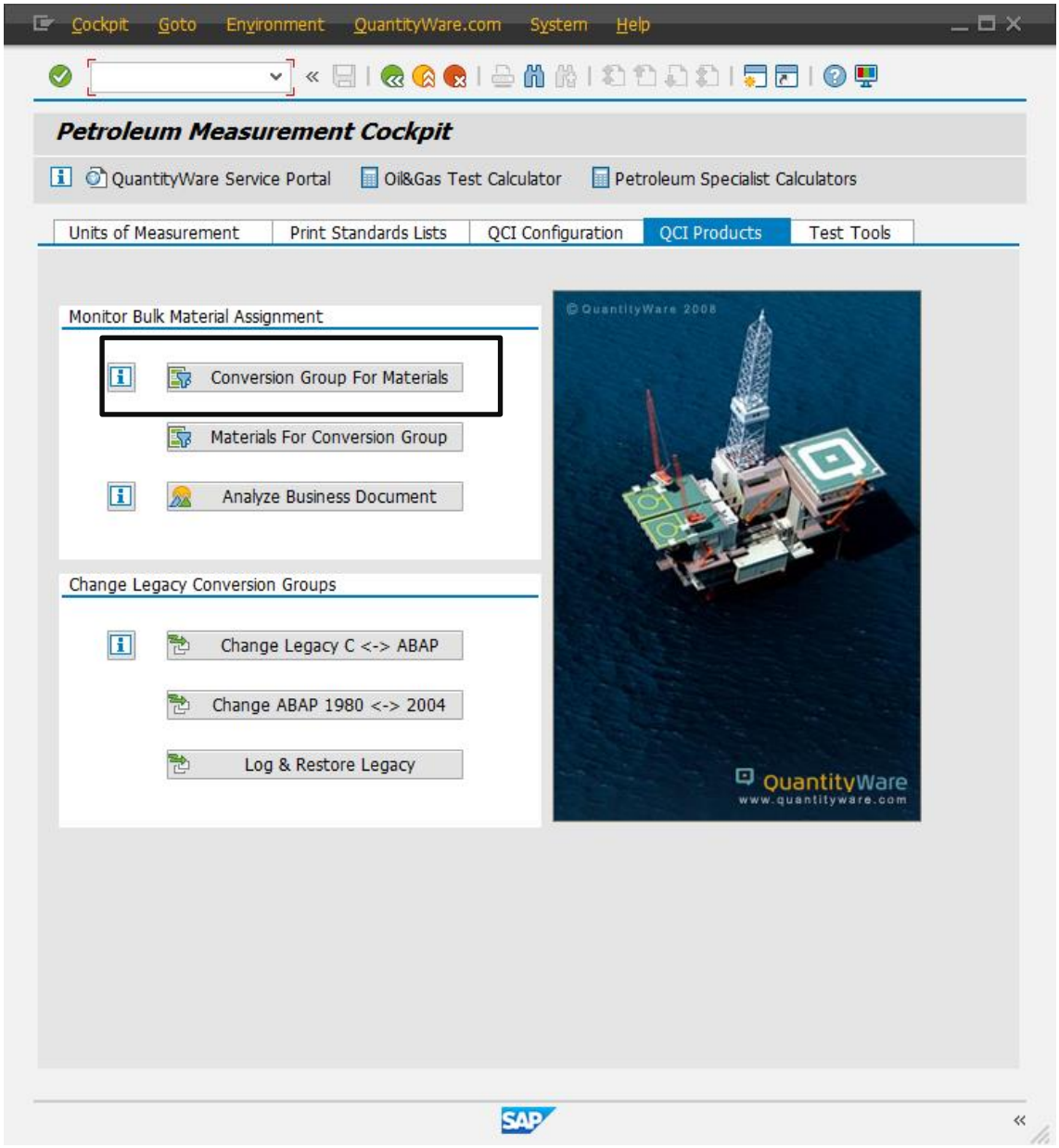
- *To determine ISO 91-1:1992 and ISO 91-2:1991 compliance, enter the respective API MPMS versions for the template conversion group selection, referenced in these two versions.*

- *Pressure corrections may be activated in an MQCI conversion group (either for ISO-91:2017 or ISO 91-1:1992 and ISO 91-2:1991) which automatically activates the required API MPMS versions.*

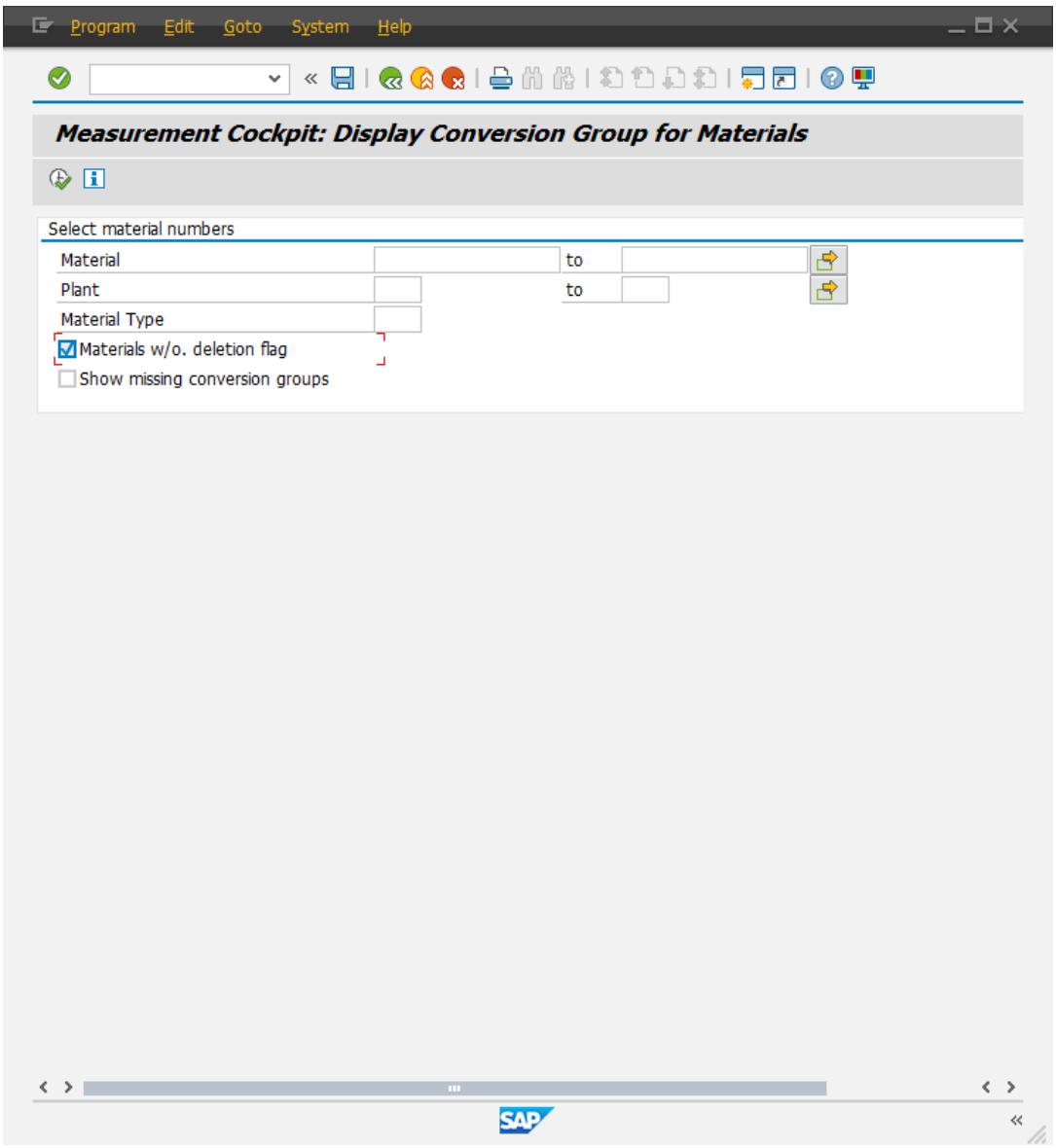
- *ISO 91:2017 also specifies replacement of ASTM Table 1 (ASTM D1250-80 Volume XI)) with API MPMS Chapter 11.5.1/2/3 (Annex D conversion factors). All conversion groups displayed in this document are already set to utilize the relevant ASTM Table 1 UoM conversions or may be set to do so with one configuration click*

Chapter 2: ISO 91:2017 Production Conversion Group Compliance

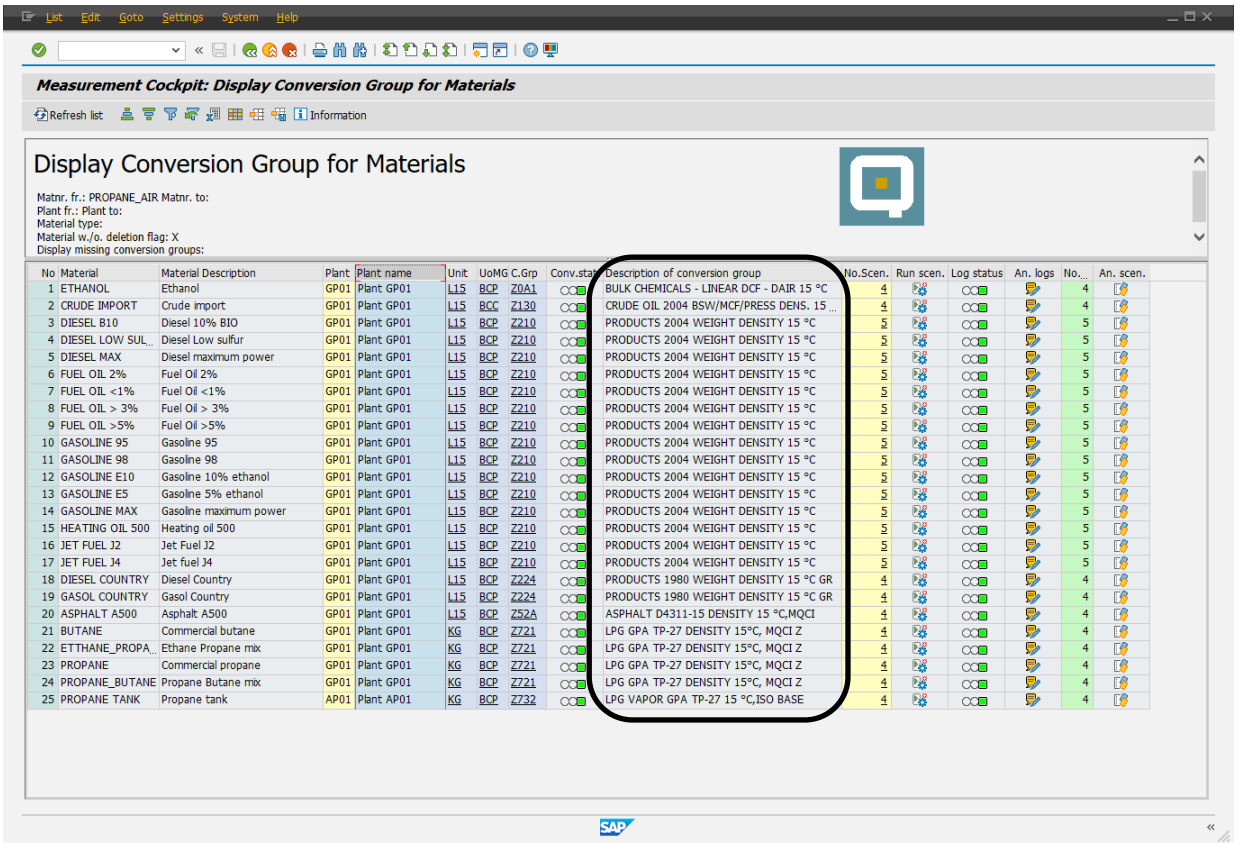
To determine whether your production conversion groups are ISO 91:2017-compliant, launch the Petroleum Measurement Cockpit in your production system and select the "QCI Products" tab strip:



Select the "Conversion Group For Materials" push button:

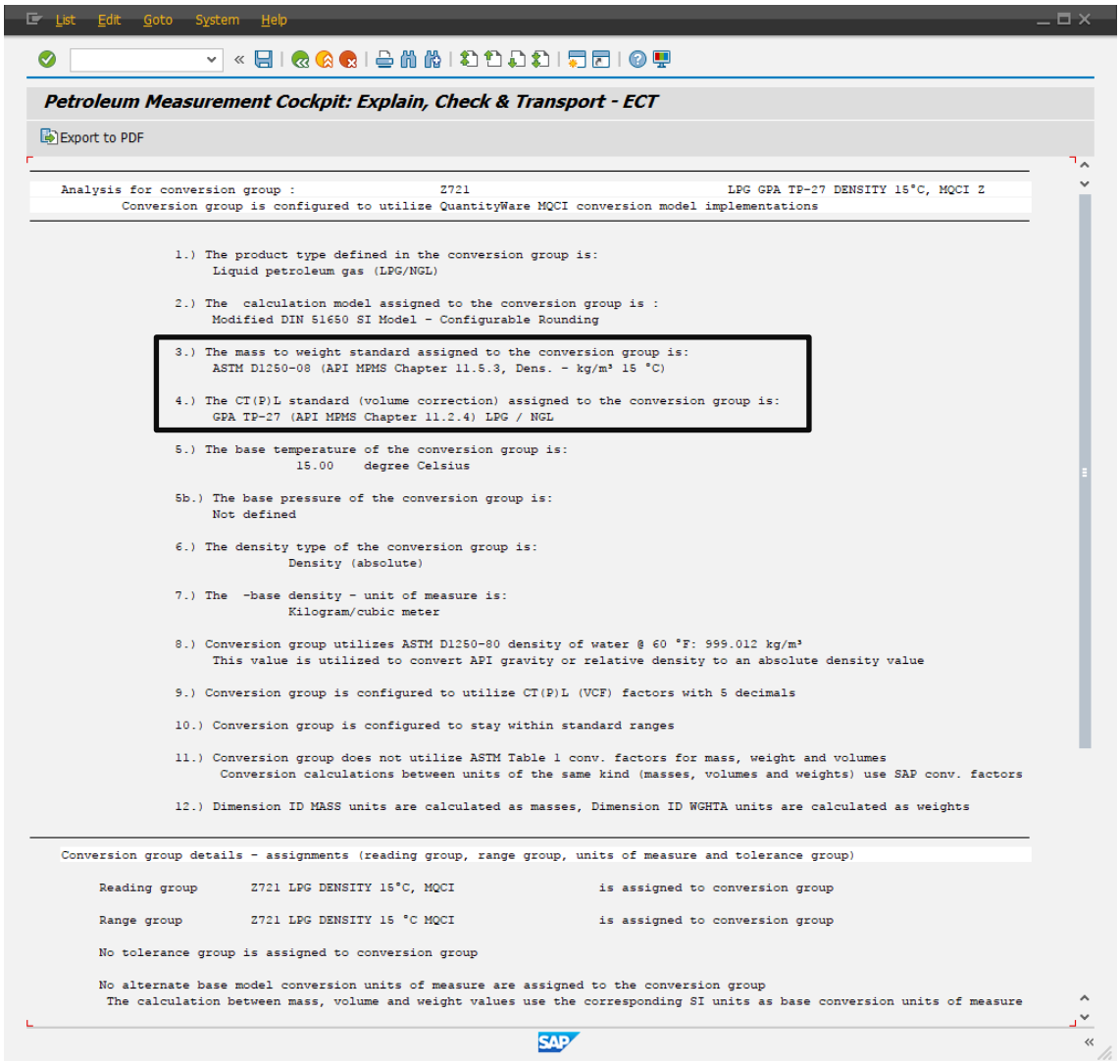


and enter a range of your production relevant material and plant values, then select "Execute" to display the comprehensive list:



No	Material	Material Description	Plant	Plant name	Unit	UoMG	C.Grp	Conv.stat.	Description of conversion group	No.Scen.	Run scen.	Log status	An. logs	No.	An. scen.
1	ETHANOL	Ethanol	GP01	Plant GP01	L15	BCP	Z0A1		BULK CHEMICALS - LINEAR DCF - DAIR 15 °C	4				4	
2	CRUDE IMPORT	Crude import	GP01	Plant GP01	L15	BCC	Z130		CRUDE OIL 2004 BSW/MCF/PRESS DENS. 15 ...	4				4	
3	DIESEL B10	Diesel 10% BIO	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
4	DIESEL LOW SUL...	Diesel Low sulfur	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
5	DIESEL MAX	Diesel maximum power	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
6	FUEL OIL 2%	Fuel Oil 2%	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
7	FUEL OIL <1%	Fuel Oil <1%	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
8	FUEL OIL > 3%	Fuel Oil > 3%	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
9	FUEL OIL >5%	Fuel Oil >5%	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
10	GASOLINE 95	Gasoline 95	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
11	GASOLINE 98	Gasoline 98	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
12	GASOLINE E10	Gasoline 10% ethanol	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
13	GASOLINE E5	Gasoline 5% ethanol	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
14	GASOLINE MAX	Gasoline maximum power	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
15	HEATING OIL 500	Heating oil 500	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
16	JET FUEL J2	Jet Fuel J2	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
17	JET FUEL J4	Jet fuel J4	GP01	Plant GP01	L15	BCP	Z210		PRODUCTS 2004 WEIGHT DENSITY 15 °C	5				5	
18	DIESEL COUNTRY	Diesel Country	GP01	Plant GP01	L15	BCP	Z224		PRODUCTS 1980 WEIGHT DENSITY 15 °C GR	4				4	
19	GASOL COUNTRY	Gasol Country	GP01	Plant GP01	L15	BCP	Z224		PRODUCTS 1980 WEIGHT DENSITY 15 °C GR	4				4	
20	ASPHALT A500	Asphalt A500	GP01	Plant GP01	L15	BCP	Z52A		ASPHALT D4311-15 DENSITY 15 °C,MQCI	4				4	
21	BUTANE	Commercial butane	GP01	Plant GP01	KG	BCP	Z721		LPG GPA TP-27 DENSITY 15°C, MQCI Z	4				4	
22	ETTHANE_PROPA...	Ethane Propane mix	GP01	Plant GP01	KG	BCP	Z721		LPG GPA TP-27 DENSITY 15°C, MQCI Z	4				4	
23	PROPANE	Commercial propane	GP01	Plant GP01	KG	BCP	Z721		LPG GPA TP-27 DENSITY 15°C, MQCI Z	4				4	
24	PROPANE_BUTANE	Propane Butane mix	GP01	Plant GP01	KG	BCP	Z721		LPG GPA TP-27 DENSITY 15°C, MQCI Z	4				4	
25	PROPANE TANK	Propane tank	AP01	Plant AP01	KG	BCP	Z732		LPG VAPOR GPA TP-27 15 °C,ISO BASE	4				4	

Double-click on the "Description of conversion group" line for any material, so that the conversion group analysis documentation is displayed for the conversion group which is assigned to the material and plant (Note: The conversion group analysis documentation can also be downloaded from your SAP system as a PDF document):



Check that under **3.)**, for **NGL/LPG**, the mass to weight standard is API MPMS Chapter 11.5.2 or API MPMS Chapter 11.5.3 and under **4.)** the CT(P)L standard is API MPMS Chapter 11.2.4.

For **crude oil and all other products**, check that under **3.)** the mass to weight standard is API MPMS Chapter 11.5.1 or API MPMS Chapter 11.5.2 or API MPMS Chapter 11.5.3 and under **4.)** the CT(P)L standard is API MPMS Chapter 11.1 - 2004.

> ⚠ *If this is the case, your Z* conversion group is compliant with ISO 91:2017.*
> *Note that ASTM Table 1 conversions should also be activated (2008 version)*

BCP Compliance Summary

In this consulting paper, the transparency capacity of the Petroleum Measurement Cockpit (PMC) in demonstrated again in great detail. Via the Petroleum Measurement Cockpit, you can easily determine whether your BCP conversion groups are compliant with ISO 91:2017 or ISO 91-1:1992 and ISO 91-2:1991, with a few clicks.

For ISO 91:2017 or ISO 91-1:1992 and ISO 91-2:1991, BCP contains fully compliant template conversion groups for all relevant products and base conditions, or allows easy re-configuration to reach compliance.

The decision as to which of the standard versions your conversion groups should comply is made during an implementation or renovation project. Such decisions require clear communication between all relevant business partners.

⚠ *IMPORTANT: Compliant conversion groups are always QuantityWare MQCI conversion groups, as in all ISO versions noted above, the Density/Weight/Volume Intraconversion - based on the relevant API MPMS - needs to be considered.*

⚠ *On the other hand, all SAP QCI conversion groups implement the hard-coded DIN 51757 weight calculations (based on an "air buoyancy factor" of - typically - 1.1 kg/m³). Only via customer projects to implement, validate and maintain specific SAP QCI BAdI realizations can compliance with the API MPMS Density/Weight/Volume Intraconversion standards be attempted.*