QuantityWare Consulting Paper

Advanced Development RESOLUÇÃO ANP No 894 – 2022 / RESOLUÇÃO CNP No 6 – 70

Implementation Details & Instructions for certified BCP consultants

Notes

This consulting paper supports certified QuantityWare BCP consultants in the implementation of the Advanced Development (AD) delivered with note 000114 – Advanced Development - Brazilian Standard RESOLUÇÃO ANP Nº 894 2022 – RESOLUÇÃO CNP Nº 6 - 70 - Tables I & II.

Version History

Version	Date	Description
01	2023-06-20	Initial Version
02	2023-11-30	Editorial revision , BCS 30A CSP03 / 30B CSP02 changes

Contents

1. Introduction & Methodology

1.1. Introduction

With RESOLUÇÃO ANP No 894 - 2022 , RESOLUÇÃO CNP No 6 – 70 has been revoked, and technically been put into force again. No changes to the 1970 Tables 1(I) and 2(II) content and description have been made. These tables are available as PDF documents (Agência Nacional do Petróleo, Gás Natural e Biocombustíveis) which are apparently scanned from historic (1970) documents. Thus, from an implementation point of view, the documentation of this new implementation will refer to it as RESOLUÇÃO ANP No 894 - 2022 / RESOLUÇÃO CNP No 6 – 70, whereas the technical implementation continues to utilize RESOLUÇÃO CNP No 6 – 70 / CNP 6 - 70 as technical ID (e.g., ABAP programs).

As described in note 000113, the current BCP support of this Brazilian standard is a Table II, algorithm-based, implementation (see Annex 1 for details). This implementation is extended with this advanced development, to support Table I density corrections for the hard coded table values. Also, an implementation for the hard coded Table II values is delivered with this note. Algorithm-based MQCI and SAP QCI integration functions are also delivered, but not released at this point in time, since the table values are the new standard and differences between the printed table values and the algorithm-based values are observable.

1.2. Methodology

Since this reconfirmed national Brazilian standard is the **printed table values**, a complete validation of the algorithm-based approach against all printed table values has been necessary as part of this development.

- In a preliminary step, a rough comparison between the algorithm-based values and a subset of the printed values has been made. Differences do occur (approx. 2 % of all the compared values) for Table I, which are documented in internal test reports. For Table II, deviations have been found for calculation results when input data requires interpolation/calculation of table values. Thus, as noted above, the algorithm-based solution is not fit for use for this newly approved Brazilian standard for both Tables I & II. The PDF table values are to be utilized.
- First, the printed values (which are of medium to very bad quality – see Annex 2 for examples) were scanned electronically and corrected via a manual process.
- Then, these values were compared with the available algorithm. If differences occurred, a manual comparison and correction process followed.
- The supporting assumption for this approach is that it is unlikely that both the PDF printed value and the algorithm-based value are identical **and** incorrect.

QuantityWare has thus invested massive effort to computerize the scanned document values of Table I and Table II and compared these values with the algorithm implementation. More than 200 000 table values have been validated and are now delivered. It is important to note that, due to the limited quality of the historical scans, single values my still be incorrect when compared with the PDF printed values.

Also, as stated above, **the now newly reconfirmed national Brazilian standard is the printed table values, not the algorithm that has been made available to QuantityWare as an XLS from industry experts in 2012.**

With the next BCS CSP, the related template configuration will also be delivered. In this consulting paper, we document the required configuration settings for the two new template conversion groups, as well as all enhancements made to the PMC and customizing and configuration.

Finally, it has been decided that the delivery of the PDF table values requires an initial load process, where each customer triggers and executes the initial load of two new customizing tables, which then contain all Table I and II values derived from the process described above. With this initial load activity each customer agrees that:

The initial content load of table 1 and table 2 of 'RESOLUÇÃO ANP No 894 – 2022, RESOLUÇÃO CNP No 6 – 70' is provided on an "AS IS" basis with no warranties.

Licensee agrees to test the configuration and software carefully before using in systems that contain productive data.

QuantityWare GmbH cannot guarantee the correctness of the table entries used in calculations nor of the correctness of the results.

In no event will QuantityWare GmbH be liable for any loss of profits, loss of use, direct, incidental, consequential, or special damages, regardless of whether QuantityWare GmbH has advance notice of the possibility of such damages.

Each customer thus must validate its initial load data and can adjust that data, if found to be incorrect, in their system.

Details are provided in the following sections.

2. Configuration Support – Advanced Development

This consulting paper provides detailed support to certified BCS consultants, who wish to implement the RESOLUÇÃO ANP No 894 - 2022 solution.

As noted above, the solution is delivered as an Advanced Development (AD) with note 000114 . Thus, note 000114 must be implemented into the customer system landscape before the configuration can be implemented in the QuantityWare template client 045 by a certified BCS consultant.

The specification details of the advanced development are briefly described in section 5 of note 000101.

For additional clarifications, a consultant inquiry ticket (available to all certified BCS consultants) should be raised via the QuantityWare Support Portal.

3. Brazilian Standard RESOLUÇÃO ANP No 894 - 2022

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Sistema de Legislação | Glossário | Perguntas Frequentes | Fale conosco | Sistemas da ANP | Imprensa

ATOS VINCULADOS | Norma em vigor | ← Ato Anterior | Ato Seguinte →

AGÊNCIA NACIONAL DO PETRÓLEO, GÁS NATURAL E BIOCOMBUSTÍVEIS

RESOLUÇÃO ANP Nº 894, DE 18 DE NOVEMBRO DE 2022 - DOU DE 23-11-2022

Estabelece os coeficientes de correção da densidade (massa específica) e do volume dos derivados de petróleo.

A DIRETORIA DA AGÊNCIA NACIONAL DO PETRÓLEO, GÁS NATURAL E BIOCOMBUSTÍVEIS - ANP, no exercício das atribuições conferidas pelo art. 65 do Regimento Interno e pelo art. 7º do Anexo I do Decreto nº 2.455, de 14 de janeiro de 1998, tendo em vista o disposto na Lei nº 9.478, de 6 de agosto de 1997 e no art. 45. da Lei nº 9.784, de 20 de janeiro de 1999, com base no Processo nº 48610.205397/2021-13 e nas deliberações tomadas na 1.105ª Reunião de Diretoria, realizada em 8 de novembro de 2022, RESOLVE:

Art. 1º Esta Resolução estabelece, para uso na comercialização dos derivados do petróleo, o coeficiente de correção para temperatura de 20ºC, da densidade (massa específica) e do volume daqueles produtos.

Parágrafo único. Os coeficientes de que se trata o caput estão disponíveis no sítio eletrônico da ANP na Internet (www.gov.br/anp) nas seguintes tabelas:

I - Tabela I - Conversão da densidade observada para densidade a 20ºC; e

II - Tabela II - Correção de volume para 20ºC.

Art. 2º Fica revogada a Resolução CNP nº 6, de 25 de junho de 1970.

Art. 3º Esta Resolução entra em vigor em 1º de dezembro de 2022.

RODOLFO HENRIQUE DE SABOIA
Diretor-Geral

Este texto não substitui o publicado no Diário Oficial da União.

publicação no sistema: 23 de novembro de 2022

Source: https://atosoficiais.com.br/anp/resolucao-n-894-2022-estabelece-os-coeficientes-de-correcao-da-densidade-massa-especifica-e-do-volume-dos-derivados-de-petroleo?origin=instituicao&q=894

In November 2022, Brazilian standard ANP No. 894 was issued:

LINK: https://www.gov.br/anp/pt-br/assuntos/qualidade-de-produtos/tabelas-de-conversao-da-densidade-e-conversao-de-volume-resolucao-anp-no-894-2022

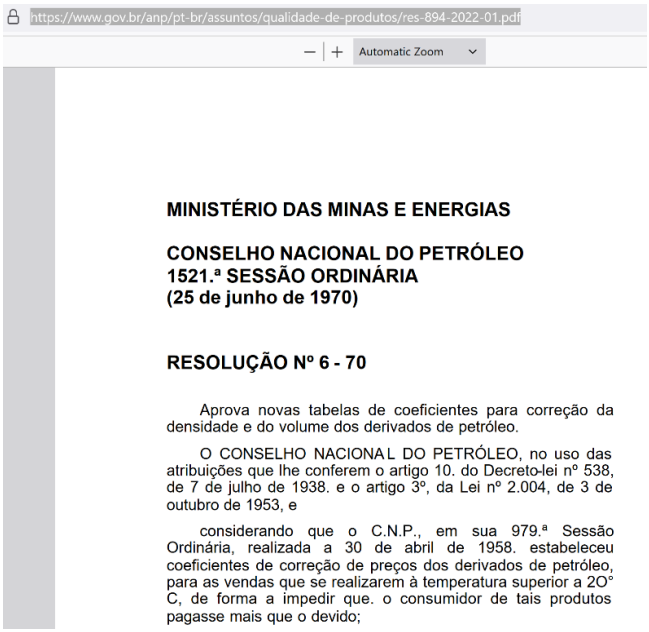
Here, the two tables I and II are accessible as PDF documents:

Table I : https://www.gov.br/anp/pt-br/assuntos/qualidade-de-produtos/res-894-2022-01.pdf

Table II : https://www.gov.br/anp/pt-br/assuntos/qualidade-de-produtos/res-894-2022-02.pdf

3.1. Standard Analysis

A detailed inspection of these two tables reveals that they are identical with the 1970 versions:



https://www.gov.br/anp/pt-br/assuntos/qualidade-de-produtos/res-894-2022-01.pdf

Automatic Zoom

MINISTÉRIO DAS MINAS E ENERGIAS

CONSELHO NACIONAL DO PETRÓLEO
1521.ª SESSÃO ORDINÁRIA
(25 de junho de 1970)

RESOLUÇÃO Nº 6 - 70

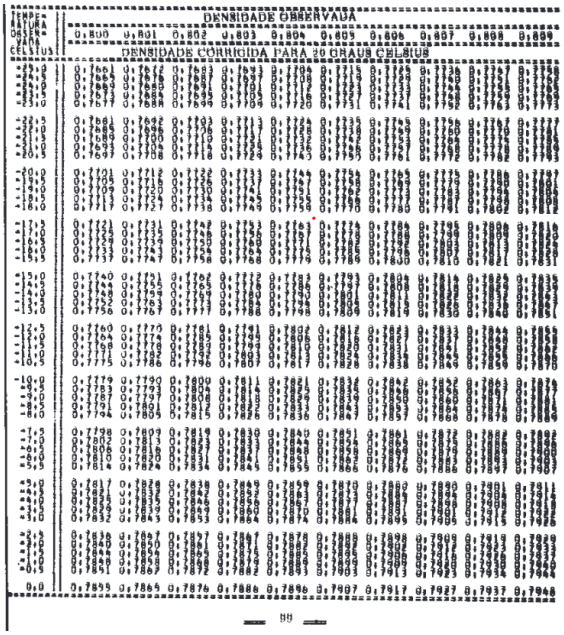
Aprova novas tabelas de coeficientes para correção da densidade e do volume dos derivados de petróleo.

O CONSELHO NACIONAL DO PETRÓLEO, no uso das atribuições que lhe conferem o artigo 10. do Decreto-lei nº 538, de 7 de julho de 1938. e o artigo 3º, da Lei nº 2.004, de 3 de outubro de 1953, e

considerando que o C.N.P., em sua 979.ª Sessão Ordinária, realizada a 30 de abril de 1958. estabeleceu coeficientes de correção de preços dos derivados de petróleo, para as vendas que se realizarem à temperatura superior a 20° C, de forma a impedir que. o consumidor de tais produtos pagasse mais que o devido;

In general, the quality of the data - provided by these two PDF documents – is extremely bad and required a massive effort by the implementation team for computerization.

Example: Table I, page 99, which is unreadable.



All issues that the QuantityWare implementation team found are documented and can be found in Annex 2 of this document.

For Table I, exactly one example is provided as to how to utilize these tables:

```
EXAMPLE
The density of a product is 0,7852 at 26°C. What will be its density at 20°C?
We find the value 0.785 in the table column "Observed Density" and note that in
the column "Observed Temperature" corresponding to 26°C, the equivalent density
at 20°C is ..........................0.7893
In the same way, for a density of 0.786, the value corresponding to 20°C is
.....................................0.7903
As an increase of 0.0010 in density at 26°C entails an increase of 0.0010 in
density at 20°C, an increase from 0.785 to 0.7852 increases the density at 20°C
by 0.2 x 0.0010, i.e. by...................0,0002
Therefore, the density at 20°C equivalent to the density 0.7852 at 26°C is 0.7893
+ 0.0002, or
.....................................0,7895
```

For Table II, two examples are provided as to how to utilize these tables:

```
Example 1
What is the volume at 20°C of 86.424 liters measured at 12.5°C
of a product whose density at 20°C is 0.6257?
We approximate the density to 0.626, which is the closest value.
next to an even digit in the third decimal place, and, entering
in the table with this value it is noted that, for the temperature of
12.5°C, the Volume Correction Factor for 20°C is
in.................................................. .........1.012
Therefore, the 86.424 liters at 12.5°C occupy a volume
20°C of 86.424 x 1.012, or ......... 87.461 l

Example 2
What is the volume at 20°C of 100,000 liters measured at 24.5°C
of a product whose density at 20°C is 0.7468?
Bring the density closer to 0.746, which is the closest value.
next to an even digit in the third decimal place and, entering
in the table with this value, one finds, for the temperature of
24.5°C, a Volume Correction Factor to 20°C equal to
The.................................................. .. 0.9951
Therefore, the 100,000 liters measured at 24.5°C occupy a
volume at 20°C of 100,000 x 0.9951, that is,
of.................................99,510 l
```

- No guidance is provided for measurements of temperature and subsequent rounding of values that are not multiples of 0.5 °C .
- Table I base density values shall apparently be calculated by interpolation between the closest observed density values. The observed density values of Table I are given with 3 decimal accuracy in kg/L, in 0.1 kg/L steps.
- No guidance is provided on rounding of the interpolated result.

- Table II base densities apparently shall be rounded to the nearest 0.2 kg/L value (The table entries(VCF) are given for densities in kg/L in 0.2 kg/L steps), to use the VCF of that rounded value.
- Finally, base density values (Table I) and VCF (Table II) below 0.650 kg/L are given (for exceptions, see Annex 2) with 3 decimals accuracy, above 0.650 kg/L with 4 decimals accuracy.

3.2. Standard Implementation Decisions

Based on the analysis results summarized in the previous chapter, and the ambiguities described therein, QuantityWare has implemented - for the table value based solution - the following **main** option:

Table I:

1. All temperature values are rounded to the nearest 0.5 °C before accessing the Table I.
2. The base density value is then either directly available "(direct hit") or calculated via an interpolation as defined by the example. The result is rounded to either 3 or 4 decimal places (kg/L value). This is also done if the observed temperature is 20 °C, which may lead to a result where e.g. an observed density of 0.6257 kg/L at 20 °C leads to a base density at 20 °C of 0.626 kg/L. (See Annex 1 for details and additional motivation to use this approach - this logic has apparently been implemented with the XLS as well).

Table II:

1. All temperature values are rounded to the nearest 0.5 °C before accessing the Table II.
2. The base density is rounded to the nearest 0.2 kg/L value before accessing the Table II and then selects the VCF defined for that base density value.

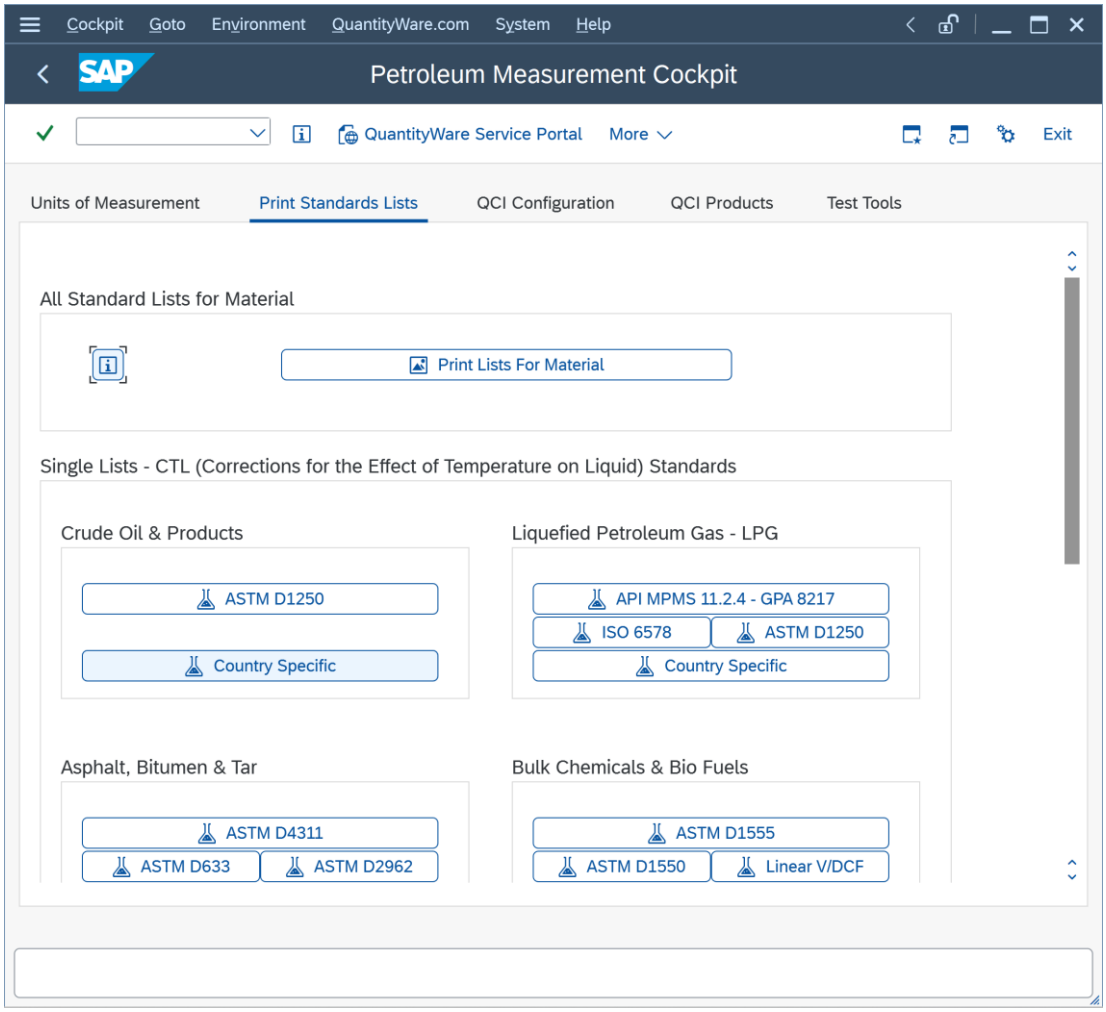
As an **alternate** approach, QuantityWare has implemented a bilinear interpolation solution, where the couple of input temperature and density value is taken to determine the rectangle of four Table I (or Table II) values surrounding that couple. Then, a bilinear interpolation is performed to determine the base density (Table I) or VCF (Table II) and subsequent rounding as defined for the main option is made.

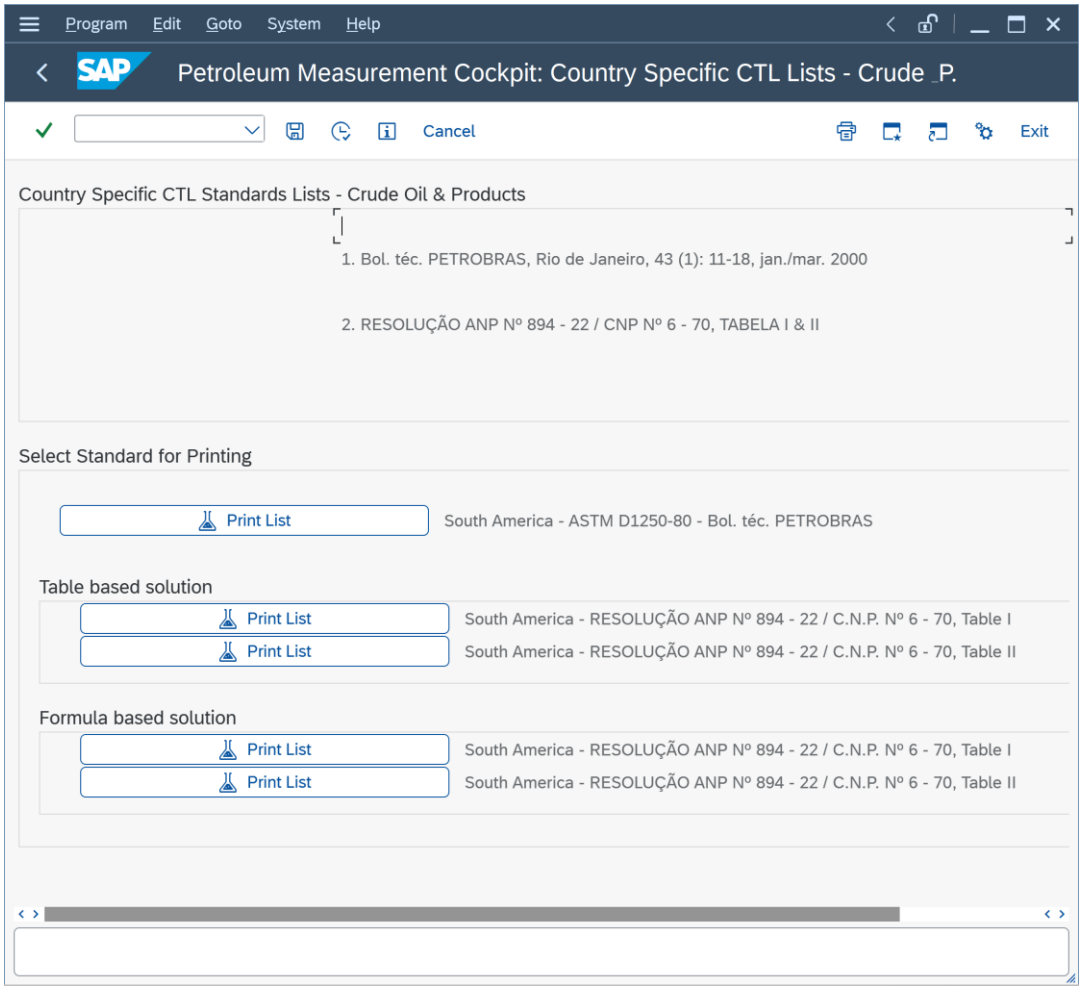
All configuration details for these options are available in the "Configuration Details" section of this document.

4. PMC Enhancements

4.1. List Printing

In section “Print Standards Lists” list printing is available via push button “Country Specific” for both “Crude Oil & Products” and “Liquefied Petroleum Gas – LPG”

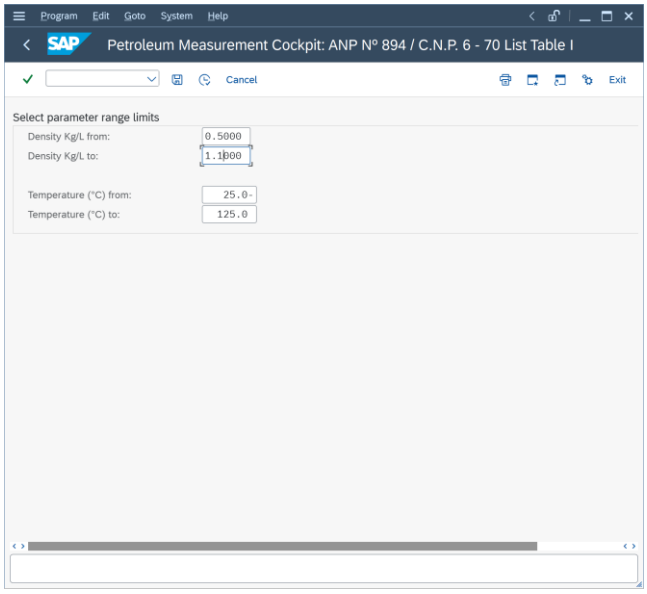




The Table based values (which you maintain in customizing, see initial load section) can all be printed here.

As a reference, the formula based calculation results can be printed here, too.

Table I: The maximum range of value is defaulted, you may restrict that range for your comparison analysis:



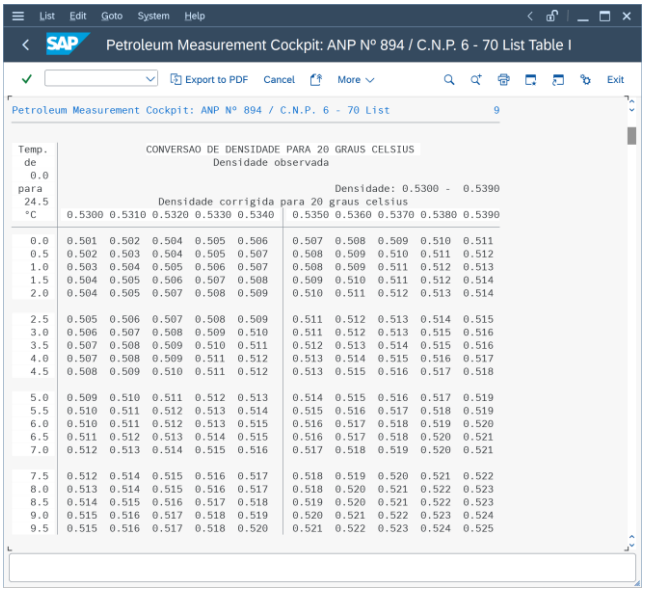
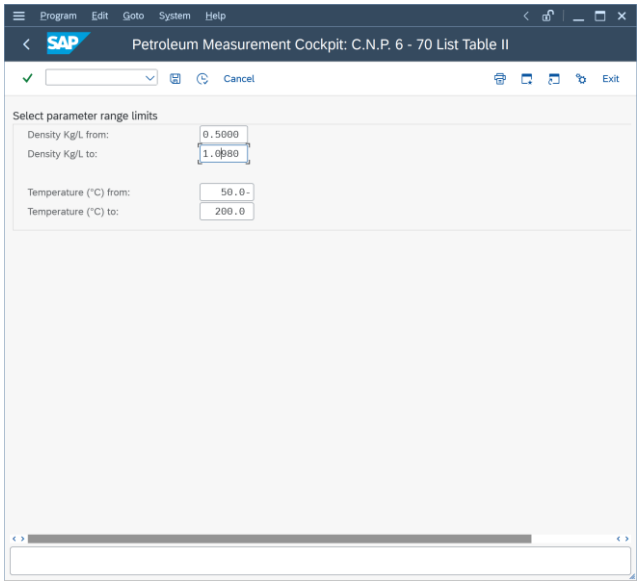
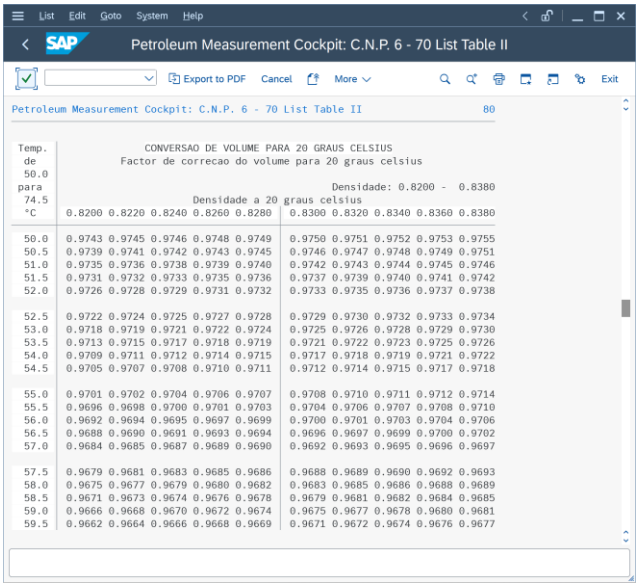


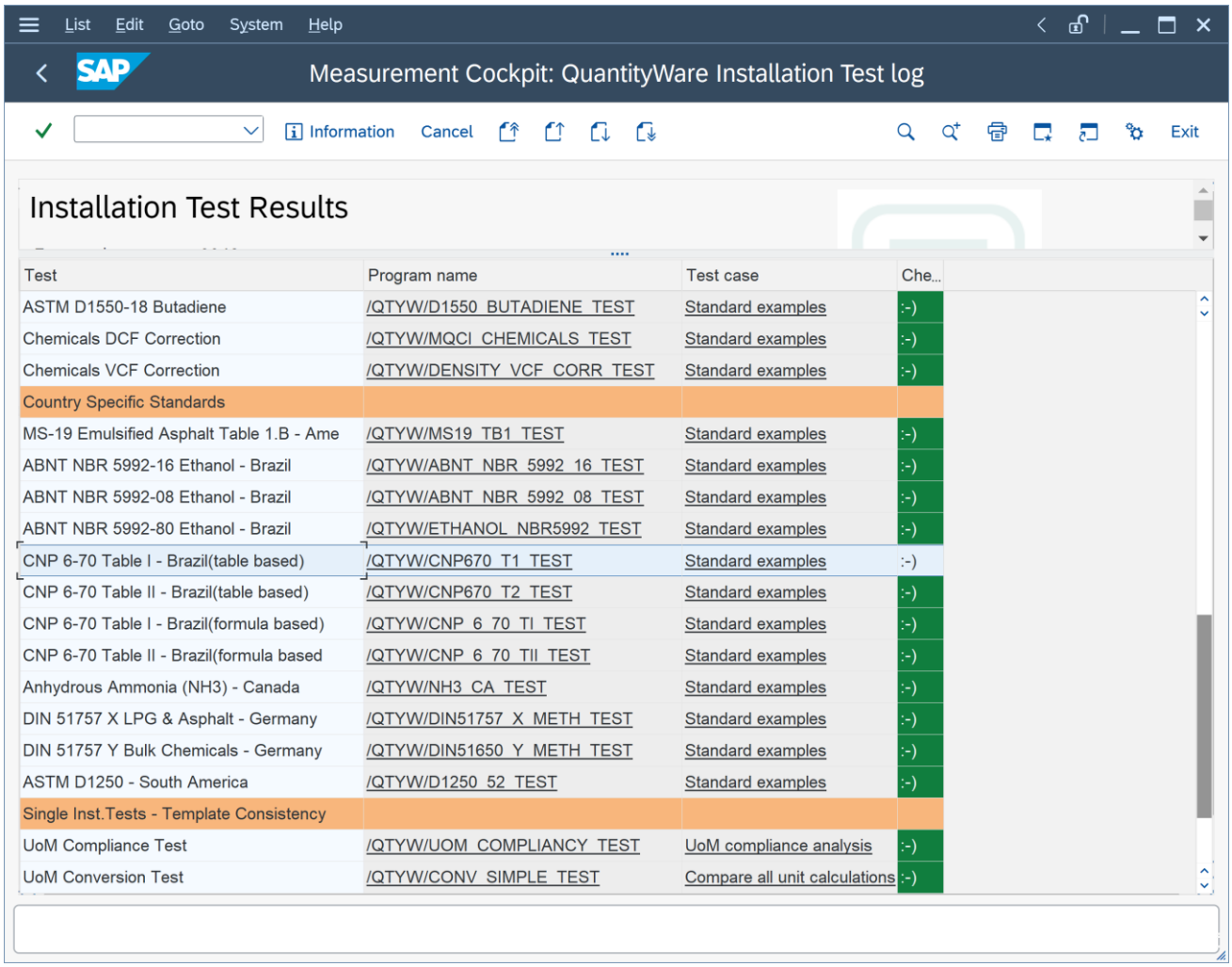
Table II: The maximum range of values is defaulted, you may restrict that range for your comparison analysis:





4.2. Test Tools

Three new test reports are delivered with this AD. These are executed as part of the BCP Installation Test, and can be accessed via the Installation Test log:

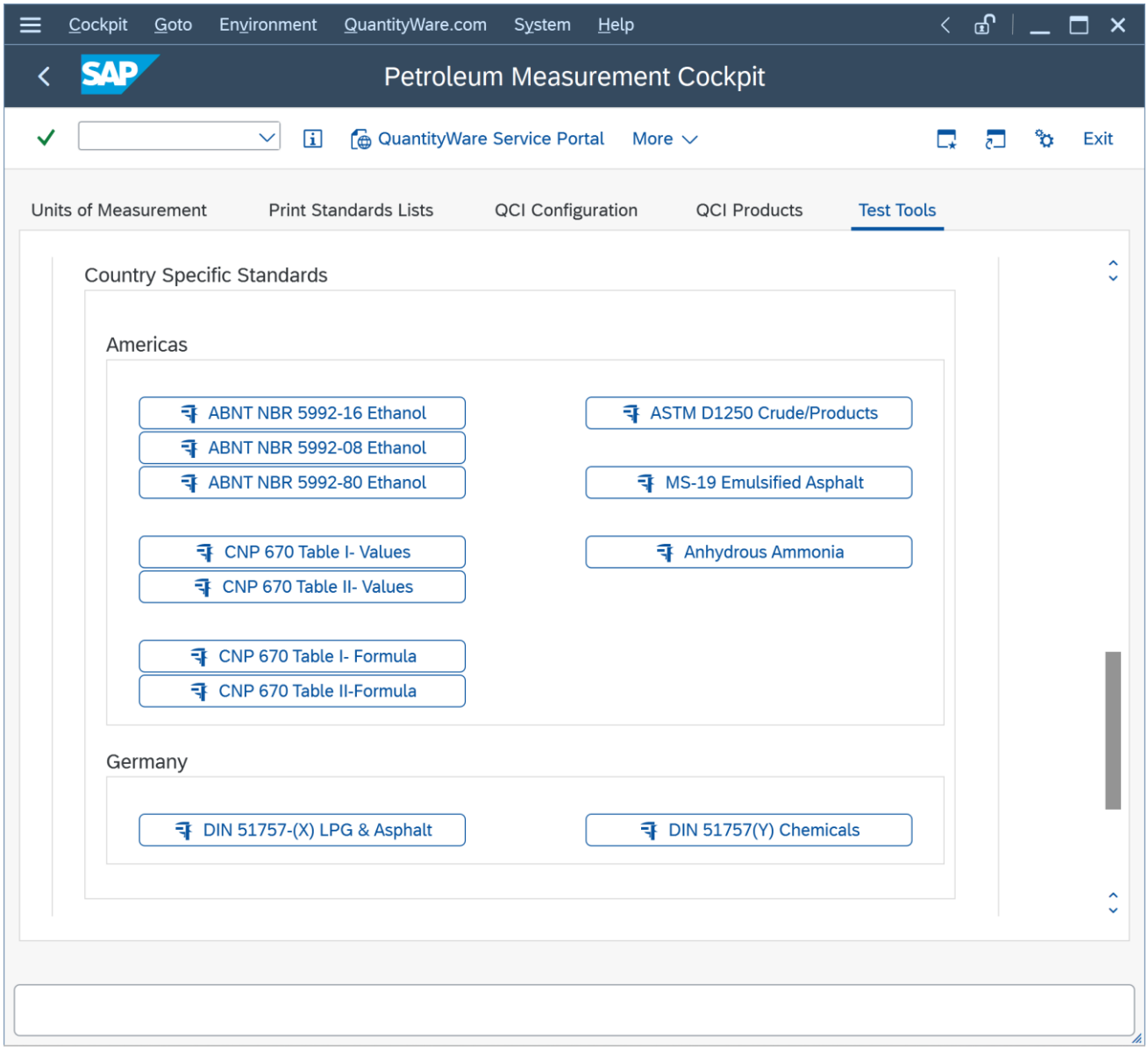


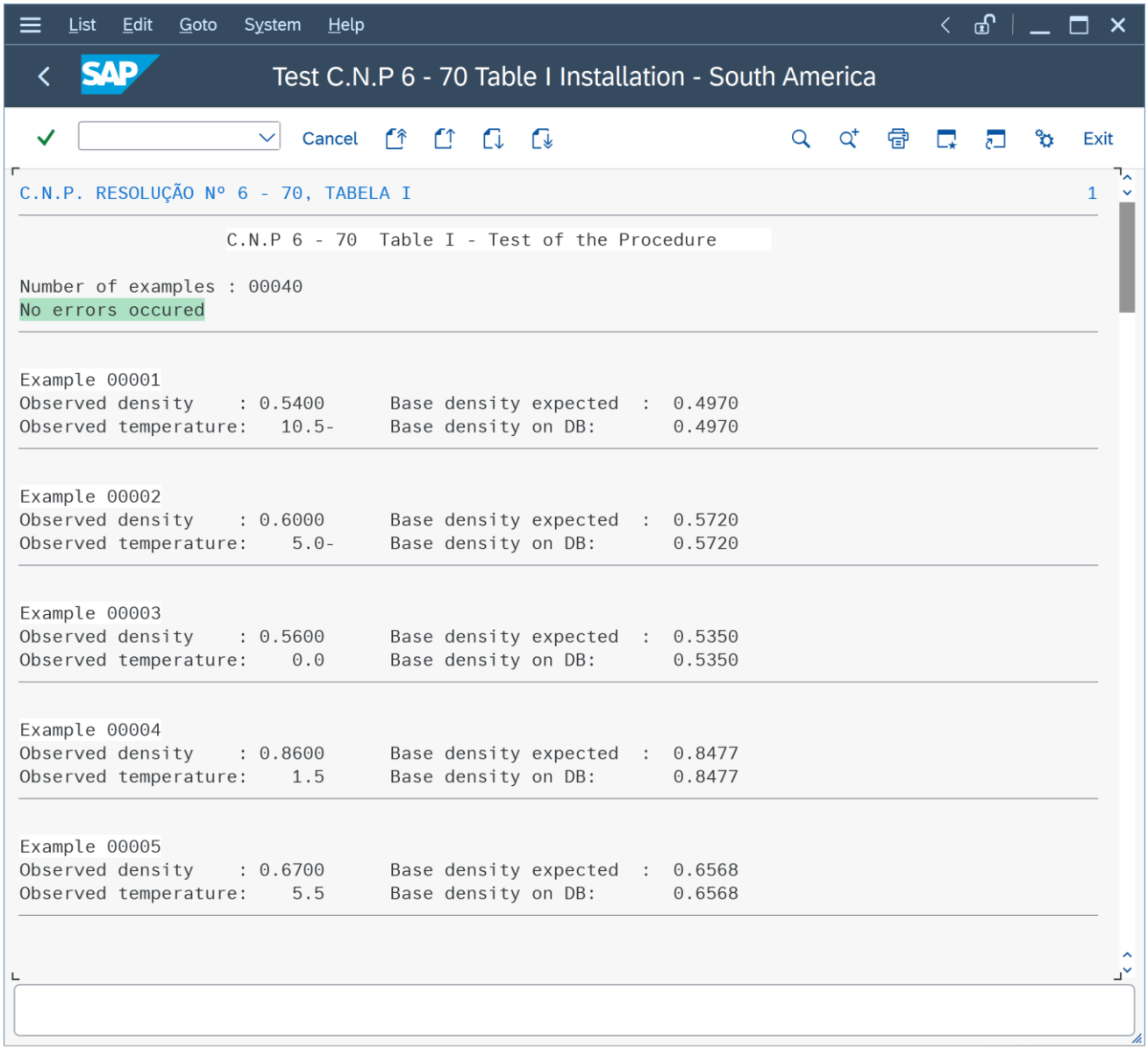
Test	Program name	Test case	Che...
ASTM D1550-18 Butadiene	/QTYW/D1550_BUTADIENE_TEST	Standard examples	:-)
Chemicals DCF Correction	/QTYW/MQCI_CHEMICALS_TEST	Standard examples	:-)
Chemicals VCF Correction	/QTYW/DENSITY_VCF_CORR_TEST	Standard examples	:-)
Country Specific Standards			
MS-19 Emulsified Asphalt Table 1.B - Ame	/QTYW/MS19_TB1_TEST	Standard examples	:-)
ABNT NBR 5992-16 Ethanol - Brazil	/QTYW/ABNT_NBR_5992_16_TEST	Standard examples	:-)
ABNT NBR 5992-08 Ethanol - Brazil	/QTYW/ABNT_NBR_5992_08_TEST	Standard examples	:-)
ABNT NBR 5992-80 Ethanol - Brazil	/QTYW/ETHANOL_NBR5992_TEST	Standard examples	:-)
CNP 6-70 Table I - Brazil(table based)	/QTYW/CNP670_T1_TEST	Standard examples	:-)
CNP 6-70 Table II - Brazil(table based)	/QTYW/CNP670_T2_TEST	Standard examples	:-)
CNP 6-70 Table I - Brazil(formula based)	/QTYW/CNP_6_70_TI_TEST	Standard examples	:-)
CNP 6-70 Table II - Brazil(formula based	/QTYW/CNP_6_70_TII_TEST	Standard examples	:-)
Anhydrous Ammonia (NH3) - Canada	/QTYW/NH3_CA_TEST	Standard examples	:-)
DIN 51757 X LPG & Asphalt - Germany	/QTYW/DIN51757_X_METH_TEST	Standard examples	:-)
DIN 51757 Y Bulk Chemicals - Germany	/QTYW/DIN51650_Y_METH_TEST	Standard examples	:-)
ASTM D1250 - South America	/QTYW/D1250_52_TEST	Standard examples	:-)
Single Inst.Tests - Template Consistency			
UoM Compliance Test	/QTYW/UOM_COMPLIANCY_TEST	UoM compliance analysis	:-)
UoM Conversion Test	/QTYW/CONV_SIMPLE_TEST	Compare all unit calculations	:-)

These report simply check if the table values match expected values for a small number of data points. 50 Test Scenarios have been created in our internal systems, which are utilized for the AD delivery assembly and QA in our internal systems.

Customers have to develop their own test scenarios after installation of the AD.

With the next CSP, the new test reports are also available via new “Country Specific Standards” push buttons:

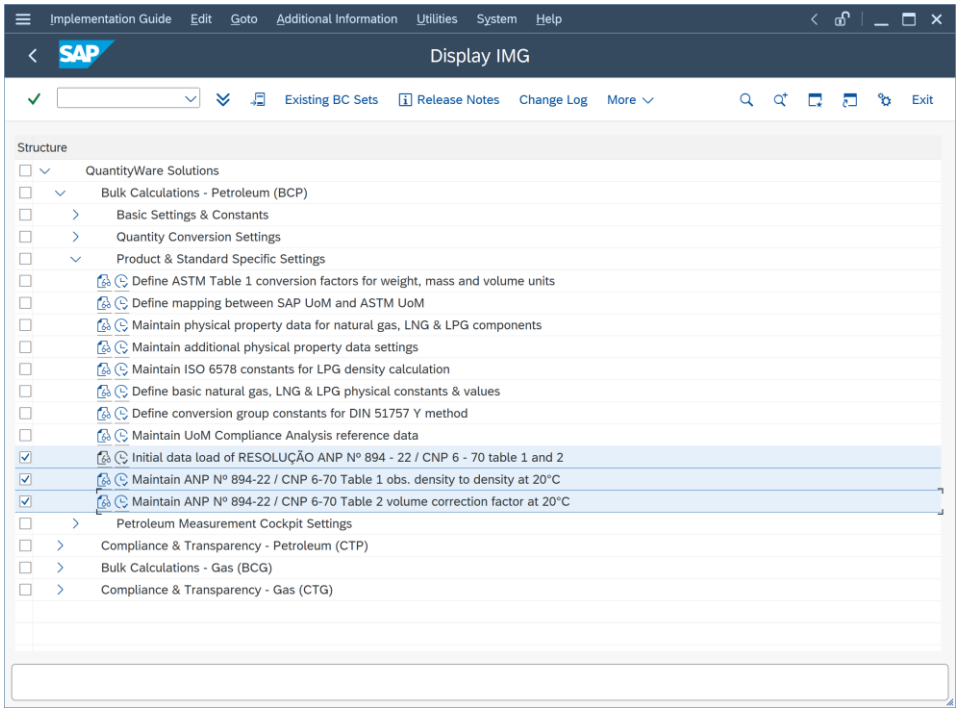

Cockpit Goto Environment QuantityWare.com System Help
Petroleum Measurement Cockpit
QuantityWare Service Portal
More
Exit
Units of Measurement
Print Standards Lists
QCI Configuration
QCI Products
Test Tools
Country Specific Standards
Americas
ABNT NBR 5992-16 Ethanol
ABNT NBR 5992-08 Ethanol
ABNT NBR 5992-80 Ethanol
ASTM D1250 Crude/Products
MS-19 Emulsified Asphalt
CNP 670 Table I- Values
CNP 670 Table II- Values
Anhydrous Ammonia
CNP 670 Table I- Formula
CNP 670 Table II-Formula
Germany
DIN 51757-(X) LPG & Asphalt
DIN 51757(Y) Chemicals


List Edit Goto System Help
Test C.N.P 6 - 70 Table I Installation - South America
Cancel
Exit
C.N.P. RESOLUÇÃO Nº 6 - 70, TABELA I 1
C.N.P 6 - 70 Table I - Test of the Procedure
Number of examples : 00040
No errors occured
Example 00001
Observed density : 0.5400 Base density expected : 0.4970
Observed temperature: 10.5- Base density on DB: 0.4970
Example 00002
Observed density : 0.6000 Base density expected : 0.5720
Observed temperature: 5.0- Base density on DB: 0.5720
Example 00003
Observed density : 0.5600 Base density expected : 0.5350
Observed temperature: 0.0 Base density on DB: 0.5350
Example 00004
Observed density : 0.8600 Base density expected : 0.8477
Observed temperature: 1.5 Base density on DB: 0.8477
Example 00005
Observed density : 0.6700 Base density expected : 0.6568
Observed temperature: 5.5 Base density on DB: 0.6568

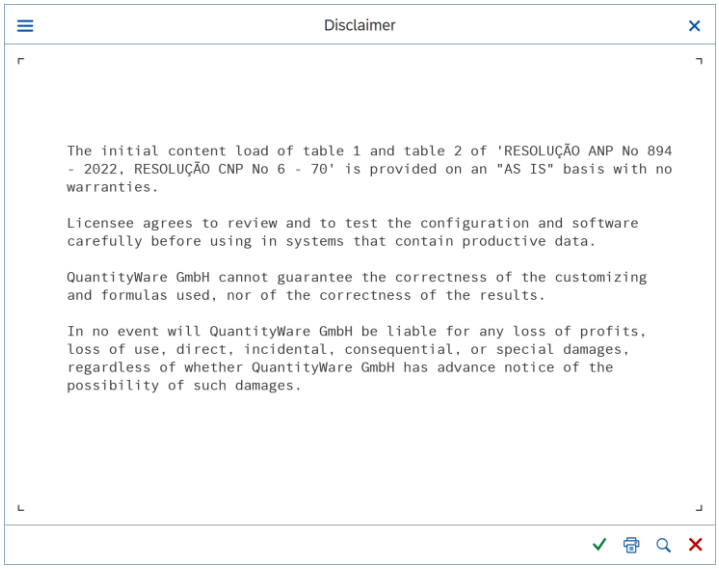
5. Configuration Details

5.1. Customizing – Initial Load & Data Maintenance

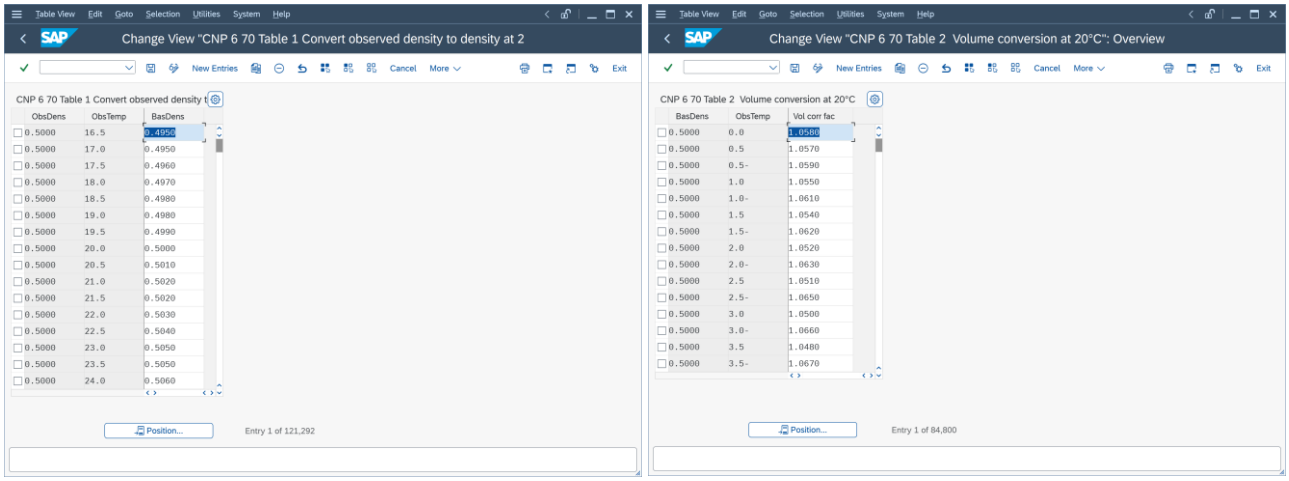
In BCP customizing, three new nodes are delivered with this AD.



After you have technically implemented the AD with note 000114, you select the initial load option:



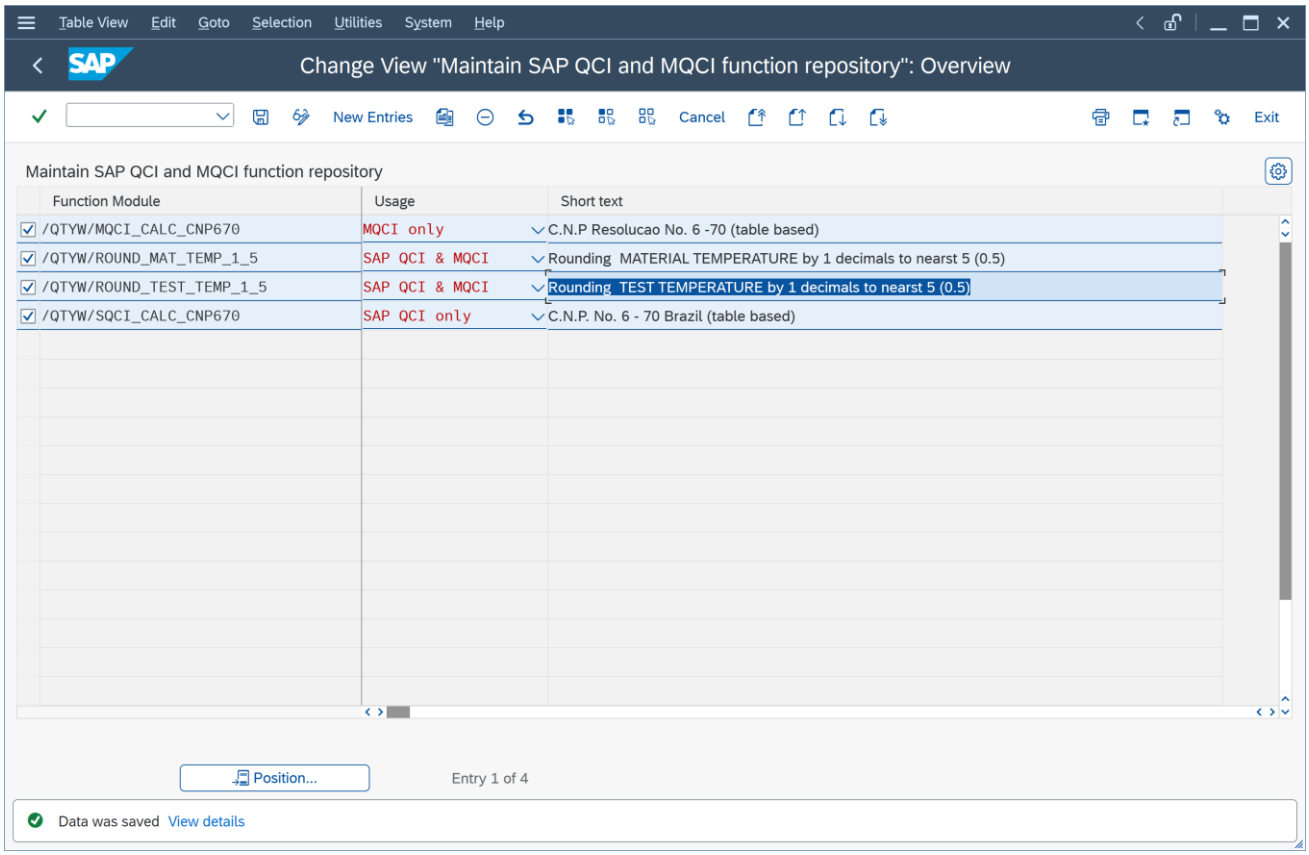
If you confirm the Disclaimer, the two new customizing tables for Table I and Table II are filled with all entries:



More than 200 000 entries are now available. Note that you have to include all entries into a transport for distribution into other clients/systems.

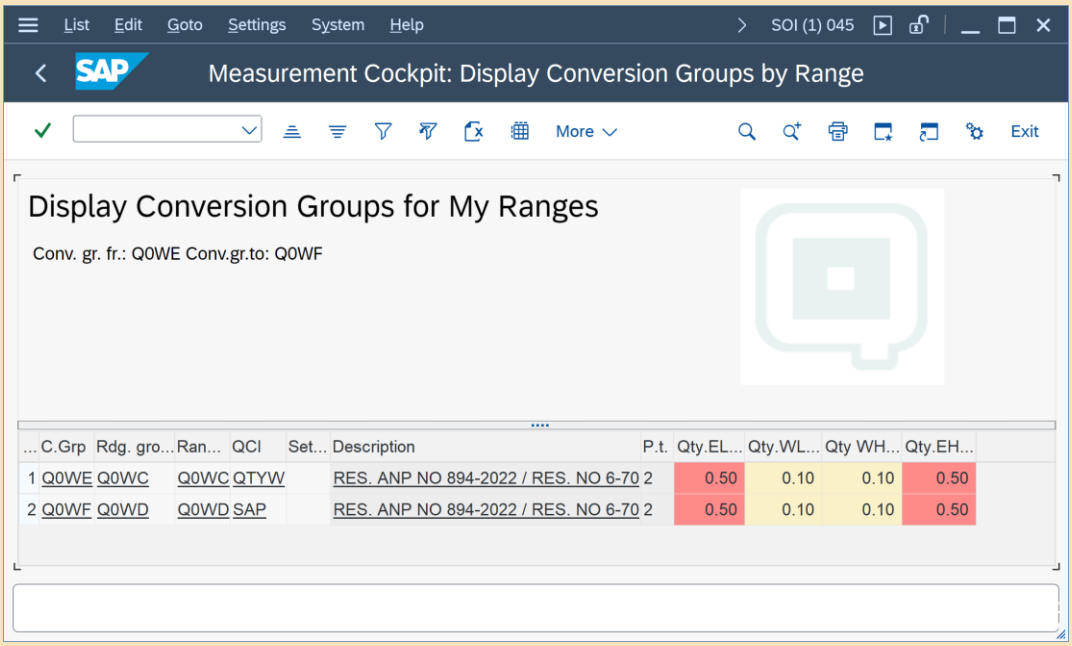
5.2. Add New Functions to Function Repository

Add the four newly delivered functions to the function repository in client 045:



5.3. Conversion Group, Reading Group & Range Group Configuration

With BCS 30A CSP03 / BCS 30B CSP02 (delivered in Q4 2023) QuantityWare delivers the two new template conversion groups Q0WE and Q0WF as part of the BCP BC set. They are available in client 045 once the BC set is activated therein. After activation, you check that the conversion group Q0WE and Q0WF with their reading groups and range groups Q0WC and Q0WD are available



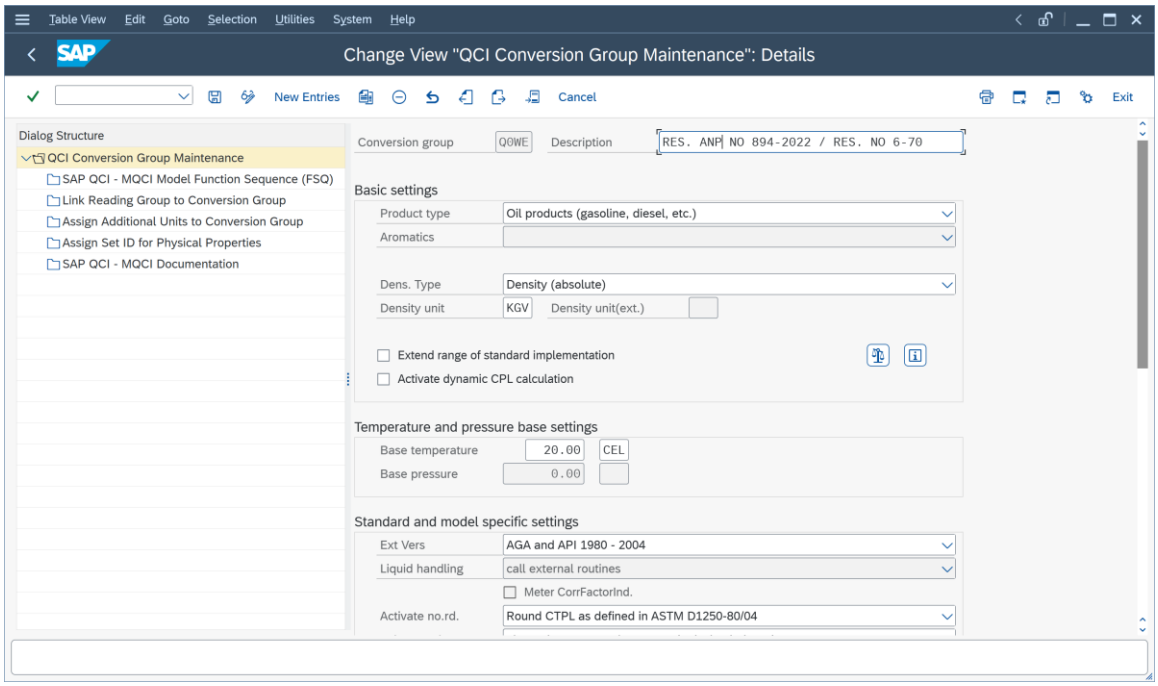
and proceed with Chapter 5.5 in this document. You do not have to perform the manual steps described in the following chapters to create the two conversion groups Q0WE and Q0WF.

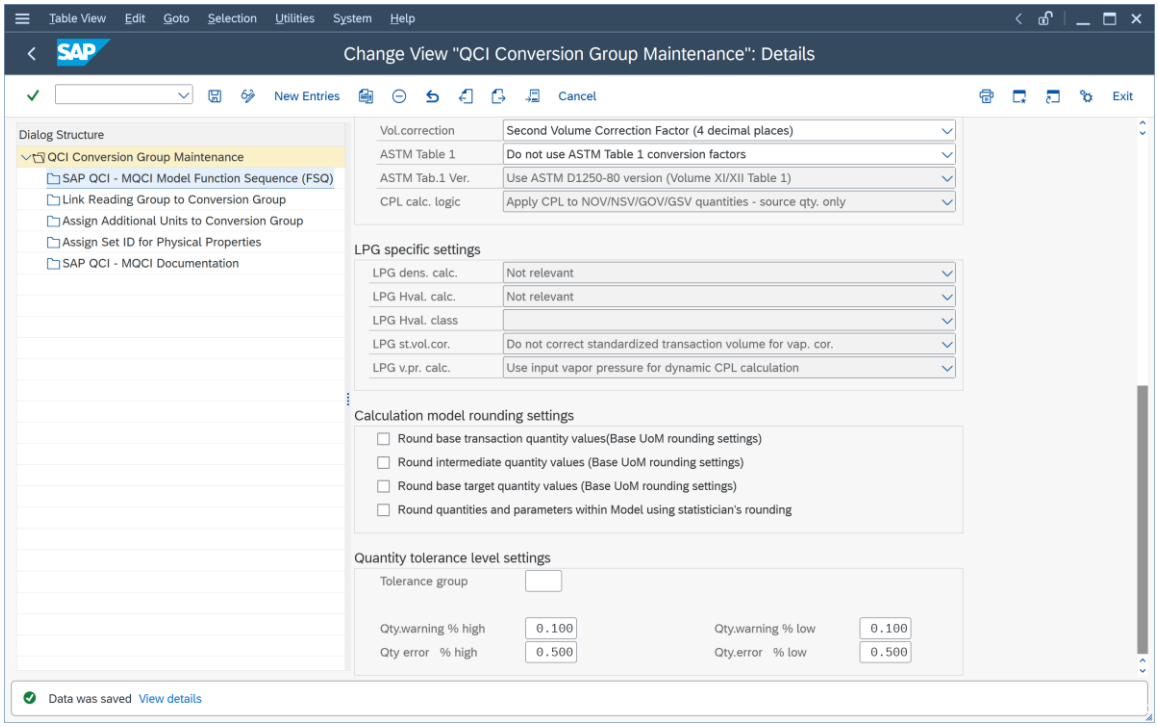
Otherwise, two conversion groups, two reading groups and two range groups must now be configured in your BCP template client 045:

Q0WE is the MQCI conversion group that utilizes the new table based implementation, Q0WF is the corresponding SAP QCI conversion group.

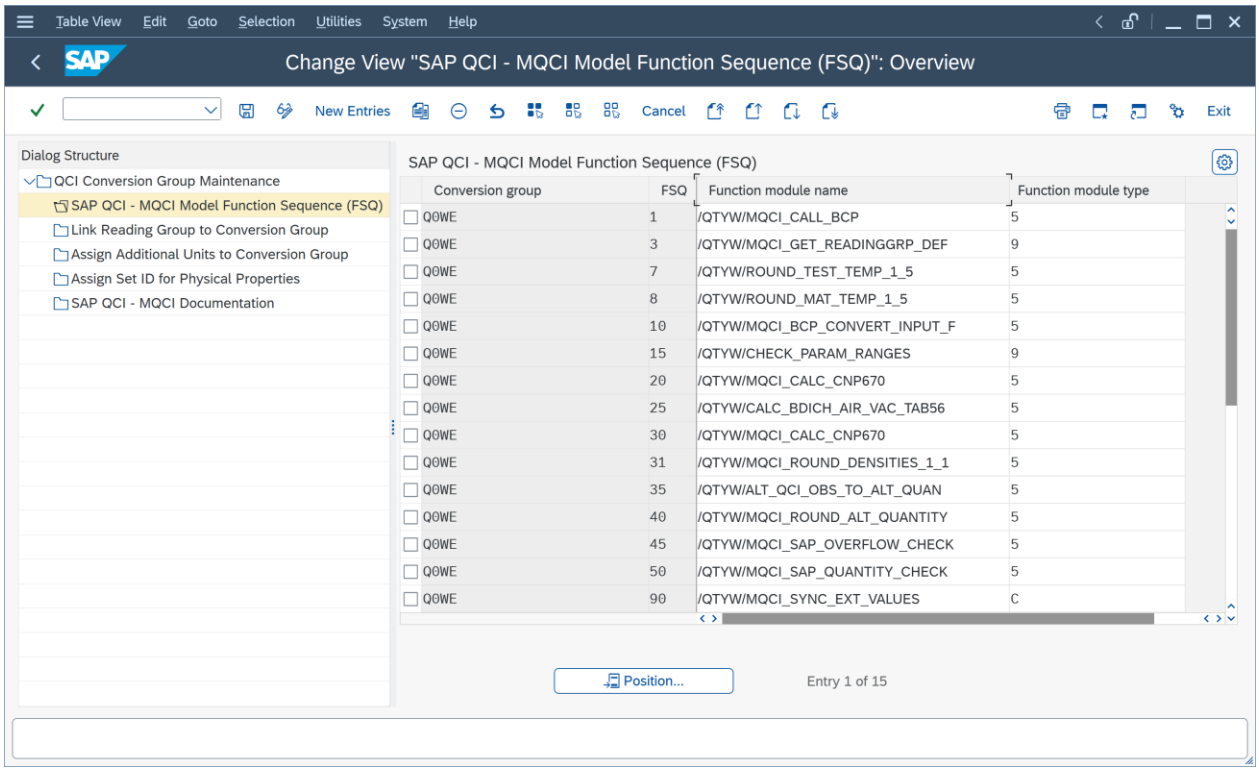
5.3.1. Q0WE Conversion Group Configuration Details

Follow the screen prints step by step – Tip: You may copy conversion group Q0WA to Q0WE and make the appropriate changes/additions:

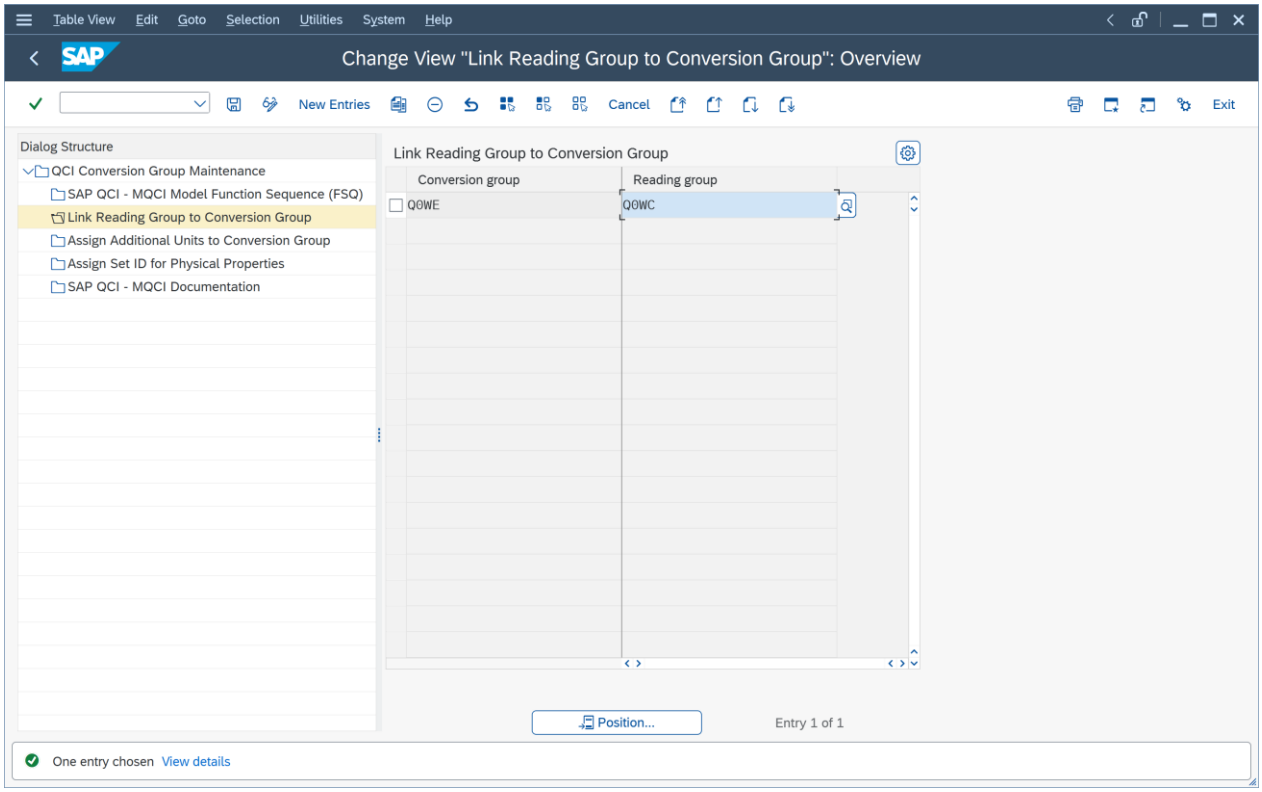




Note: the Vol. correction setting has no effect on the VCF rounding and is set to 4 merely for documentation purposes. As explained above, 3 decimal and 4 decimal VCF are defined as table values, depending on the density value.



Q0WE	1	/QTYW/MQCI_CALL_BCP	5
Q0WE	3	/QTYW/MQCI_GET_READINGGRP_DEF	9
Q0WE	7	/QTYW/ROUND_TEST_TEMP_1_5	5
Q0WE	8	/QTYW/ROUND_MAT_TEMP_1_5	5
Q0WE	10	/QTYW/MQCI_BCP_CONVERT_INPUT_F	5
Q0WE	15	/QTYW/CHECK_PARAM_RANGES	9
Q0WE	20	/QTYW/MQCI_CALC_CNP670	5
Q0WE	25	/QTYW/CALC_BDICH_AIR_VAC_TAB56	5
Q0WE	30	/QTYW/MQCI_CALC_CNP670	5
Q0WE	31	/QTYW/MQCI_ROUND_DENSITIES_1_1	5
Q0WE	35	/QTYW/ALT_QCI_OBS_TO_ALT_QUAN	5
Q0WE	40	/QTYW/MQCI_ROUND_ALT_QUANTITY	5
Q0WE	45	/QTYW/MQCI_SAP_OVERFLOW_CHECK	5
Q0WE	50	/QTYW/MQCI_SAP_QUANTITY_CHECK	5
Q0WE	90	/QTYW/MQCI_SYNC_EXT_VALUES	C



(Note: You have to maintain reading group Q0WC before you assign it here)

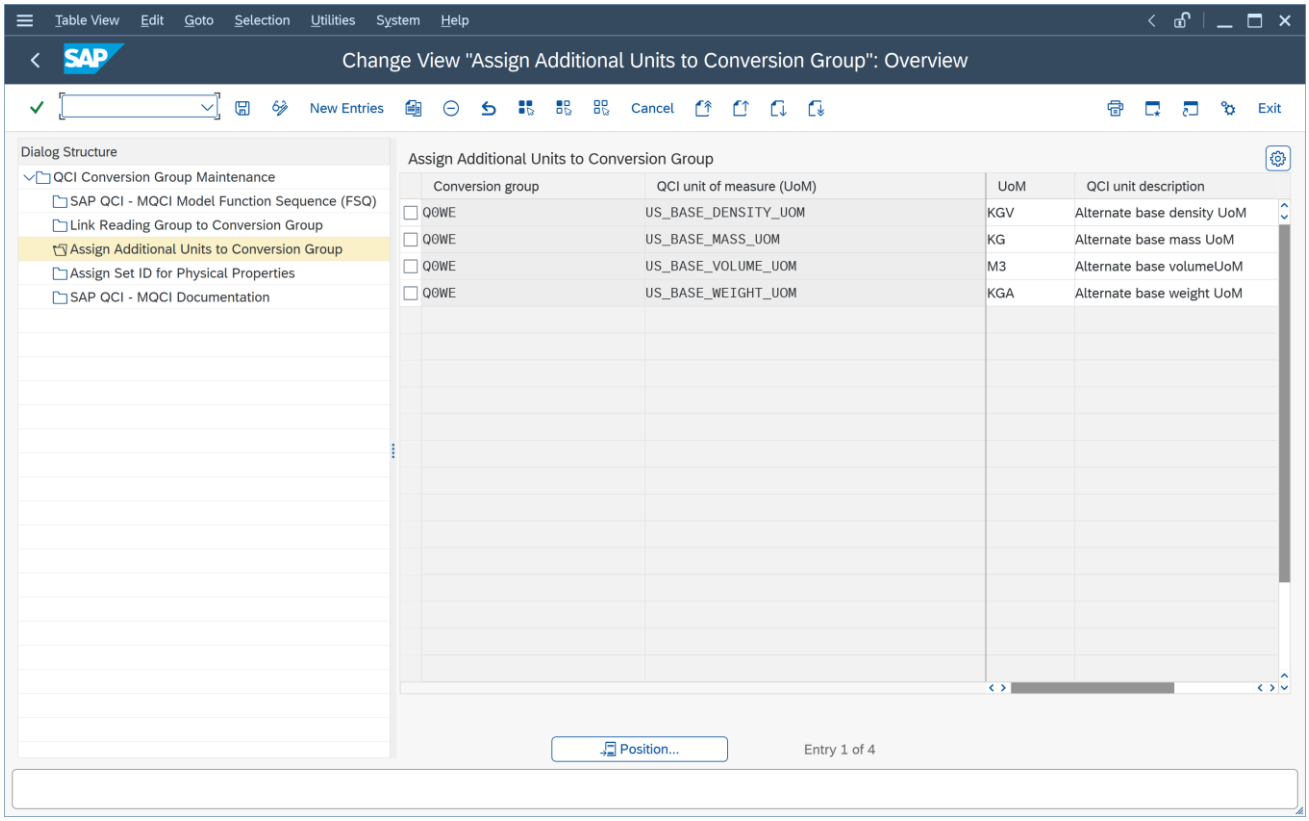


Table View Edit Goto Selection Utilities System Help
Change View "Assign Additional Units to Conversion Group": Overview
New Entries Cancel Exit
Dialog Structure
QCI Conversion Group Maintenance
SAP QCI - MQCI Model Function Sequence (FSQ)
Link Reading Group to Conversion Group
Assign Additional Units to Conversion Group
Assign Set ID for Physical Properties
SAP QCI - MQCI Documentation
Assign Additional Units to Conversion Group
Conversion group
QCI unit of measure (UoM)
UoM
QCI unit description
Q0WE US_BASE_DENSITY_UOM KGV Alternate base density UoM
Q0WE US_BASE_MASS_UOM KG Alternate base mass UoM
Q0WE US_BASE_VOLUME_UOM M3 Alternate base volumeUoM
Q0WE US_BASE_WEIGHT_UOM KGA Alternate base weight UoM
Position...
Entry 1 of 4

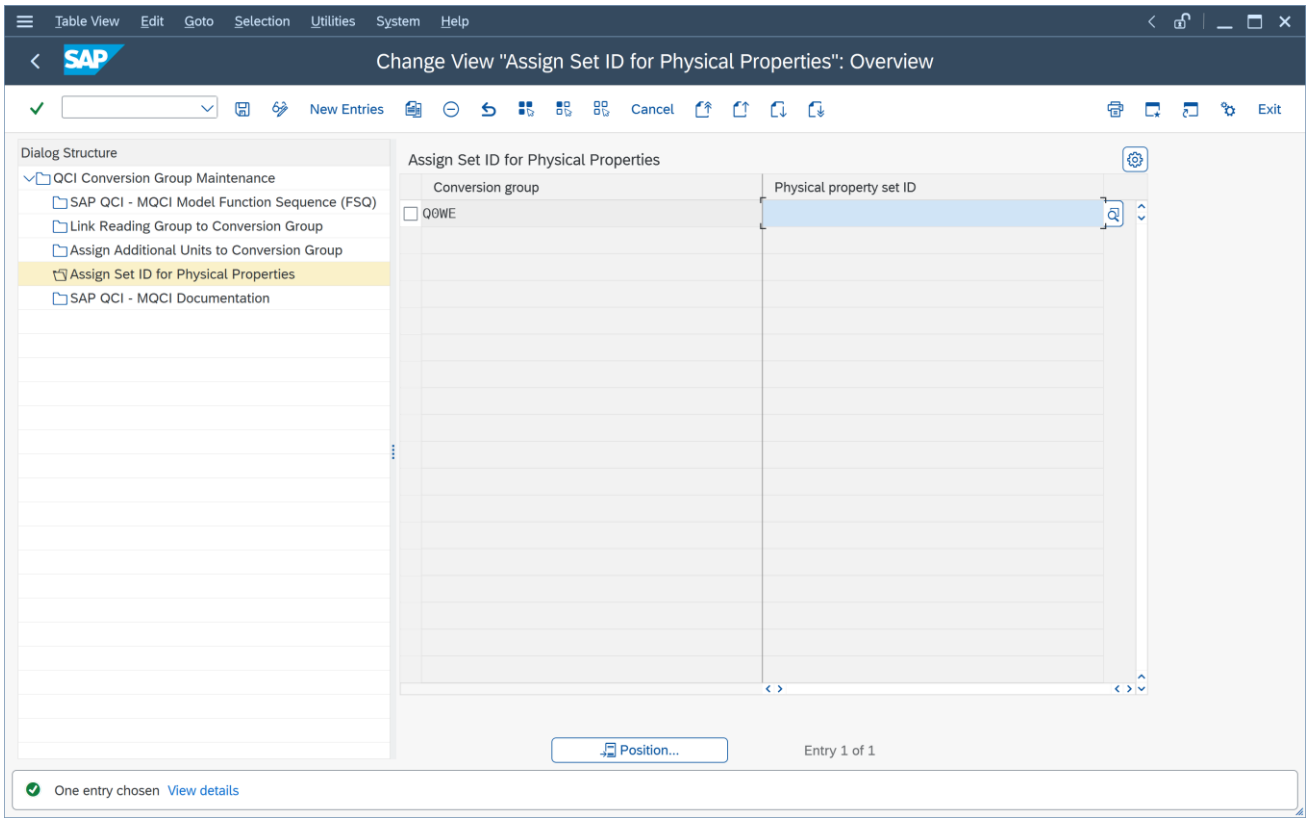


Table View Edit Goto Selection Utilities System Help
Change View "Assign Set ID for Physical Properties": Overview
New Entries Cancel Exit
Dialog Structure
QCI Conversion Group Maintenance
SAP QCI - MQCI Model Function Sequence (FSQ)
Link Reading Group to Conversion Group
Assign Additional Units to Conversion Group
Assign Set ID for Physical Properties
SAP QCI - MQCI Documentation
Assign Set ID for Physical Properties
Conversion group
Physical property set ID
Q0WE
Position...
Entry 1 of 1
One entry chosen View details

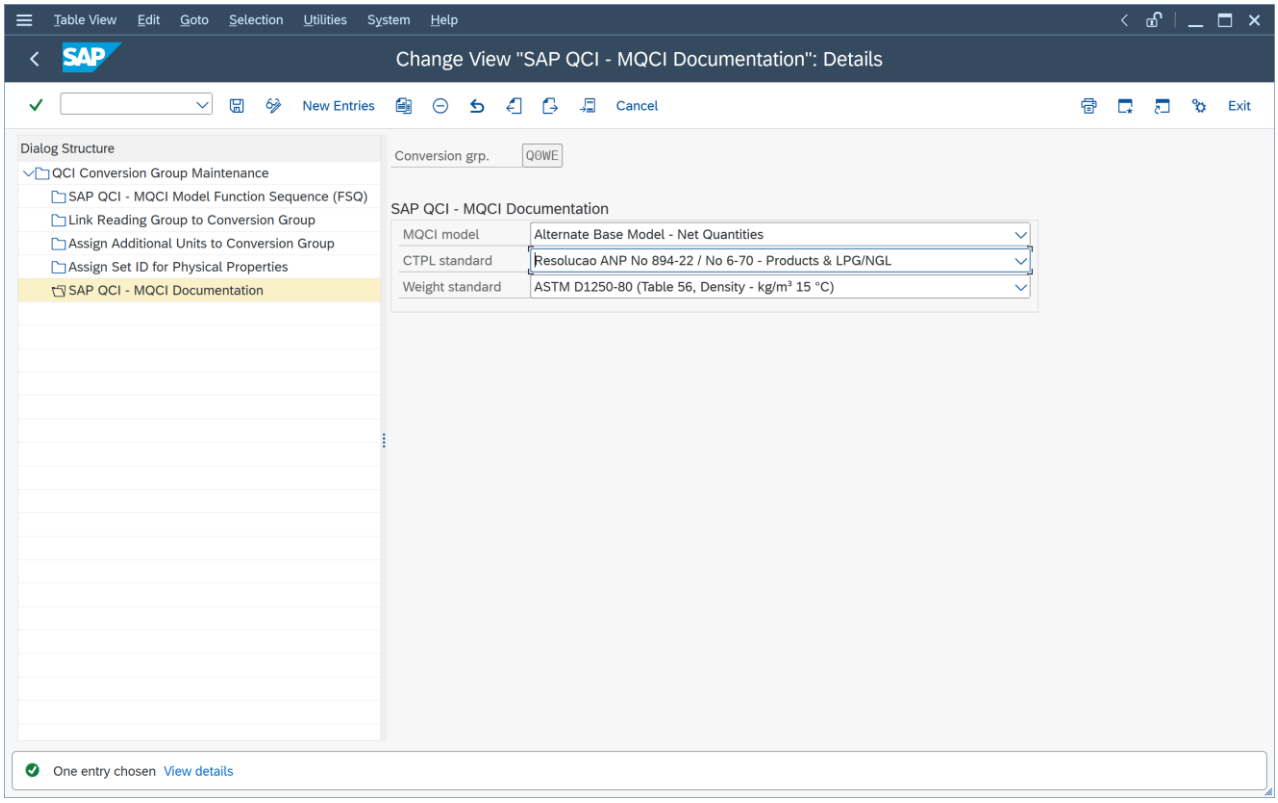
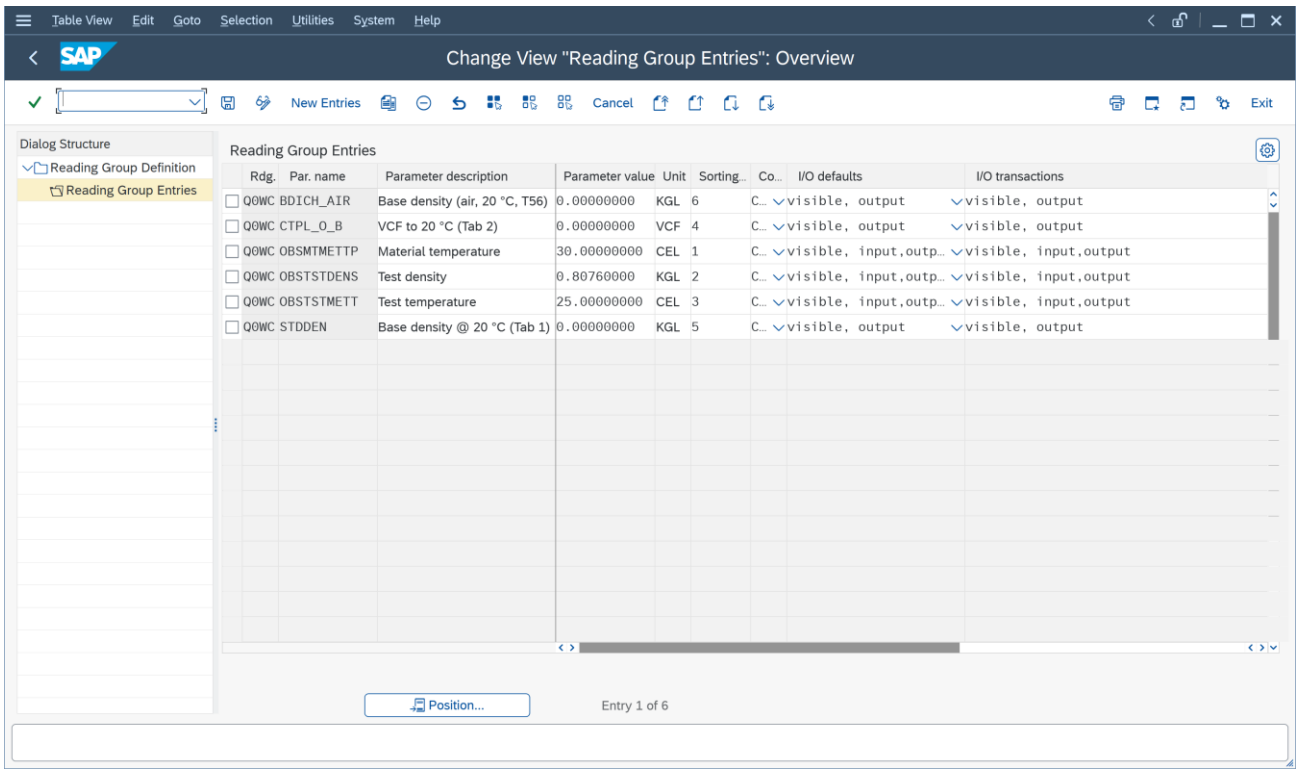


Table View Edit Goto Selection Utilities System Help
Change View "SAP QCI - MQCI Documentation": Details
New Entries
Cancel
Exit
Dialog Structure
QCI Conversion Group Maintenance
SAP QCI - MQCI Model Function Sequence (FSQ)
Link Reading Group to Conversion Group
Assign Additional Units to Conversion Group
Assign Set ID for Physical Properties
SAP QCI - MQCI Documentation
Conversion grp.
Q0WE
SAP QCI - MQCI Documentation
MQCI model
Alternate Base Model - Net Quantities
CTPL standard
Resolucao ANP No 894-22 / No 6-70 - Products & LPG/NGL
Weight standard
ASTM D1250-80 (Table 56, Density - kg/m³ 15 °C)
One entry chosen
View details

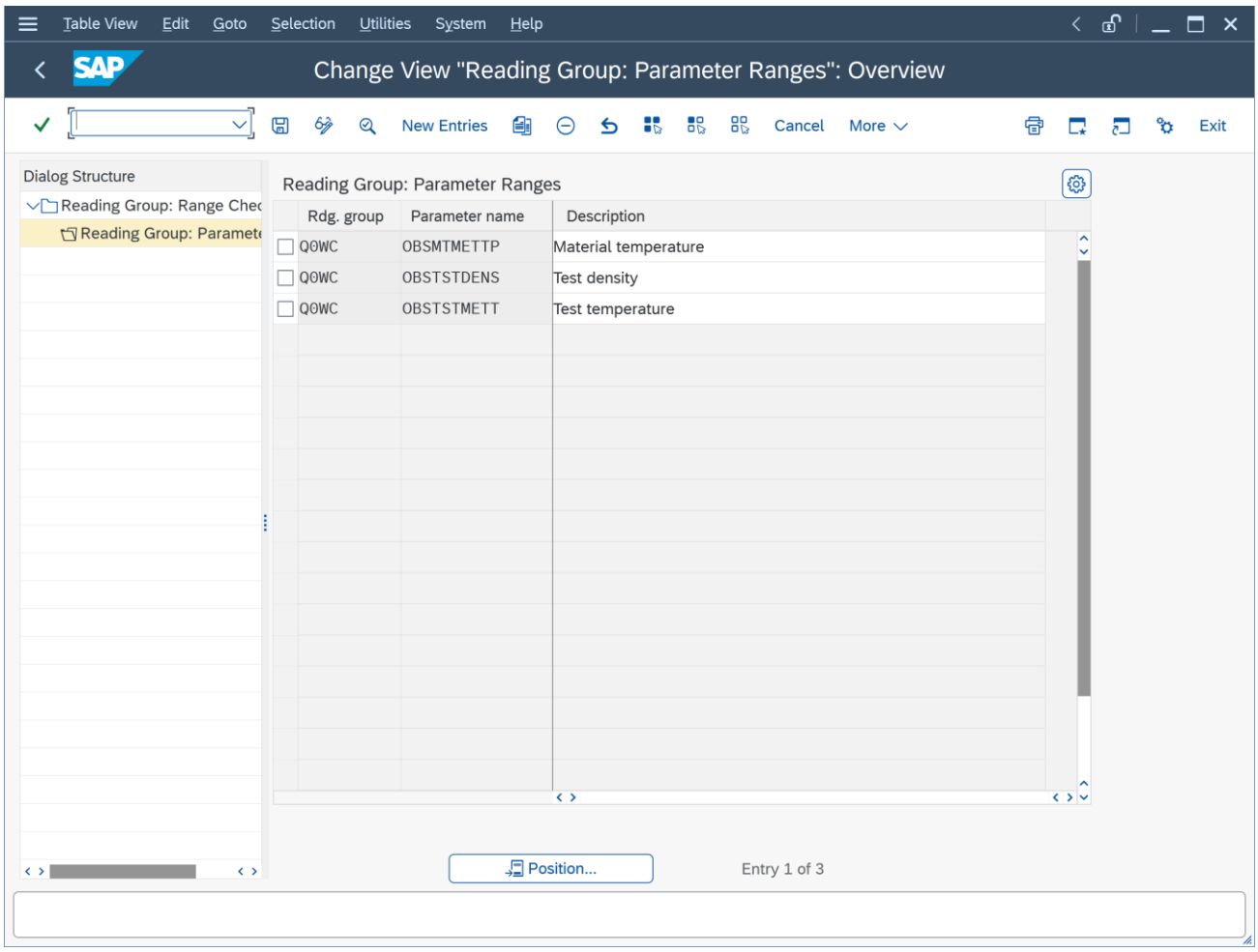
5.3.2. Q0WC Reading Group Configuration Details

Define reading group Q0WC – “RES. ANP NO 894-2022 / RES. NO 6-70” with the following entries:



5.3.3. Q0WC Range Group Configuration Details

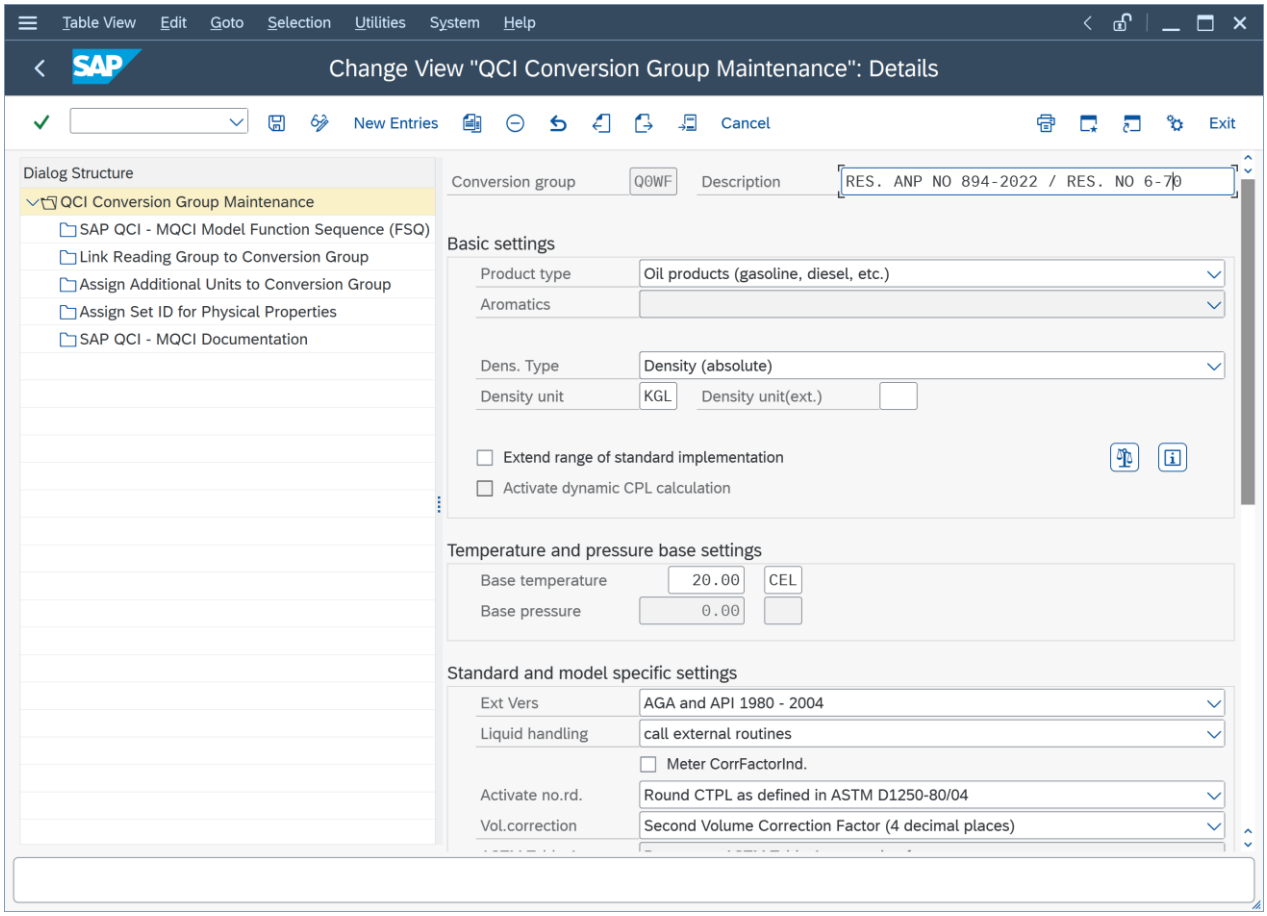
Define range group Q0WC – “RES. ANP NO 894-2022 / RES. NO 6-70” with the following entries:



Note: define appropriate range values for your products in your X/Y/Z*** copy of the new template conversion group.

5.3.4. Q0WF Conversion Group Configuration Details

Follow the screen prints step by step – Tip: You may copy conversion group Q0WB to Q0WF and make the appropriate changes/additions:



Note: the Vol. correction setting has no effect on the VCF rounding and is set to 4 merely for documentation purposes. As explained above, 3 decimal and 4 decimal VCF are defined as table values, depending on the density value.

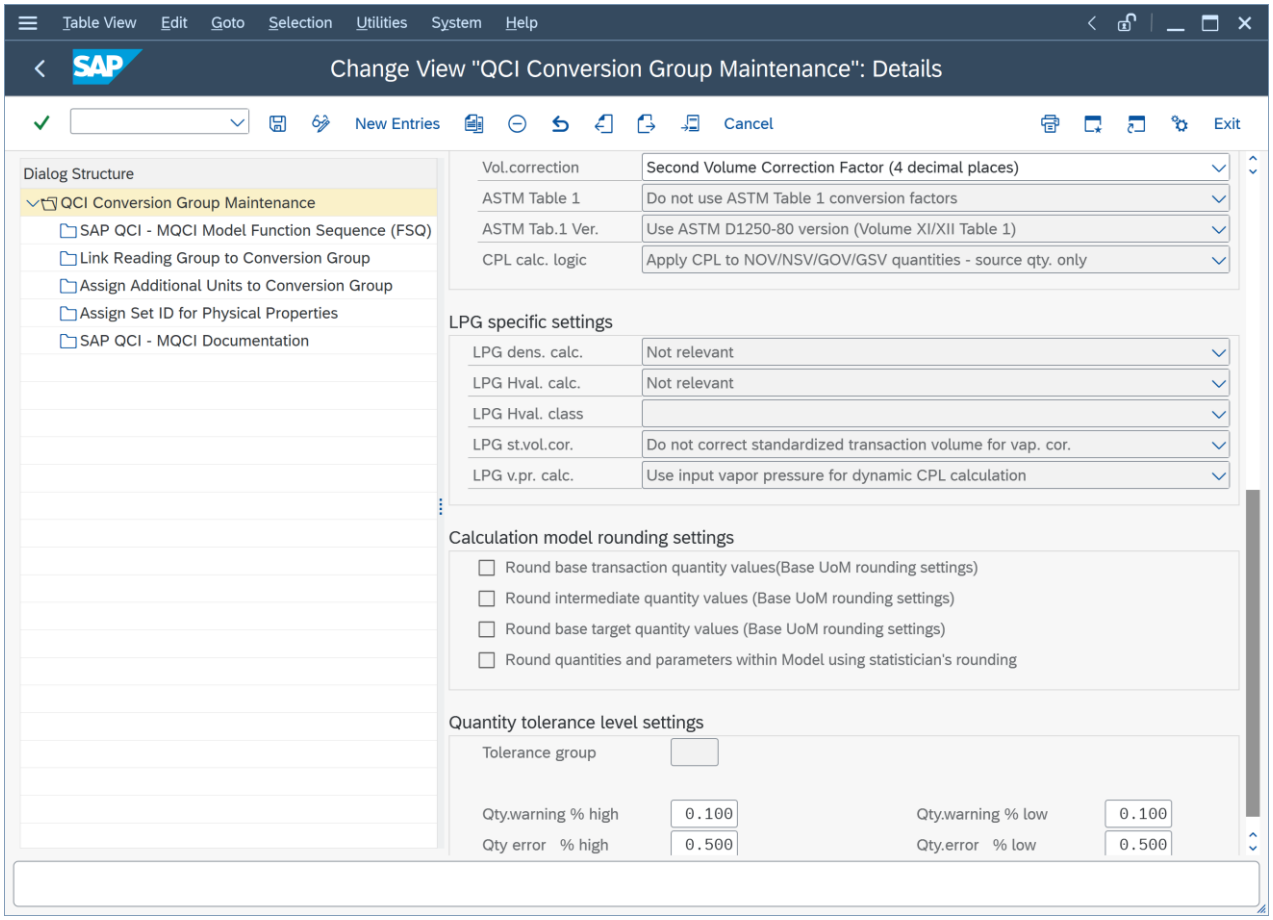
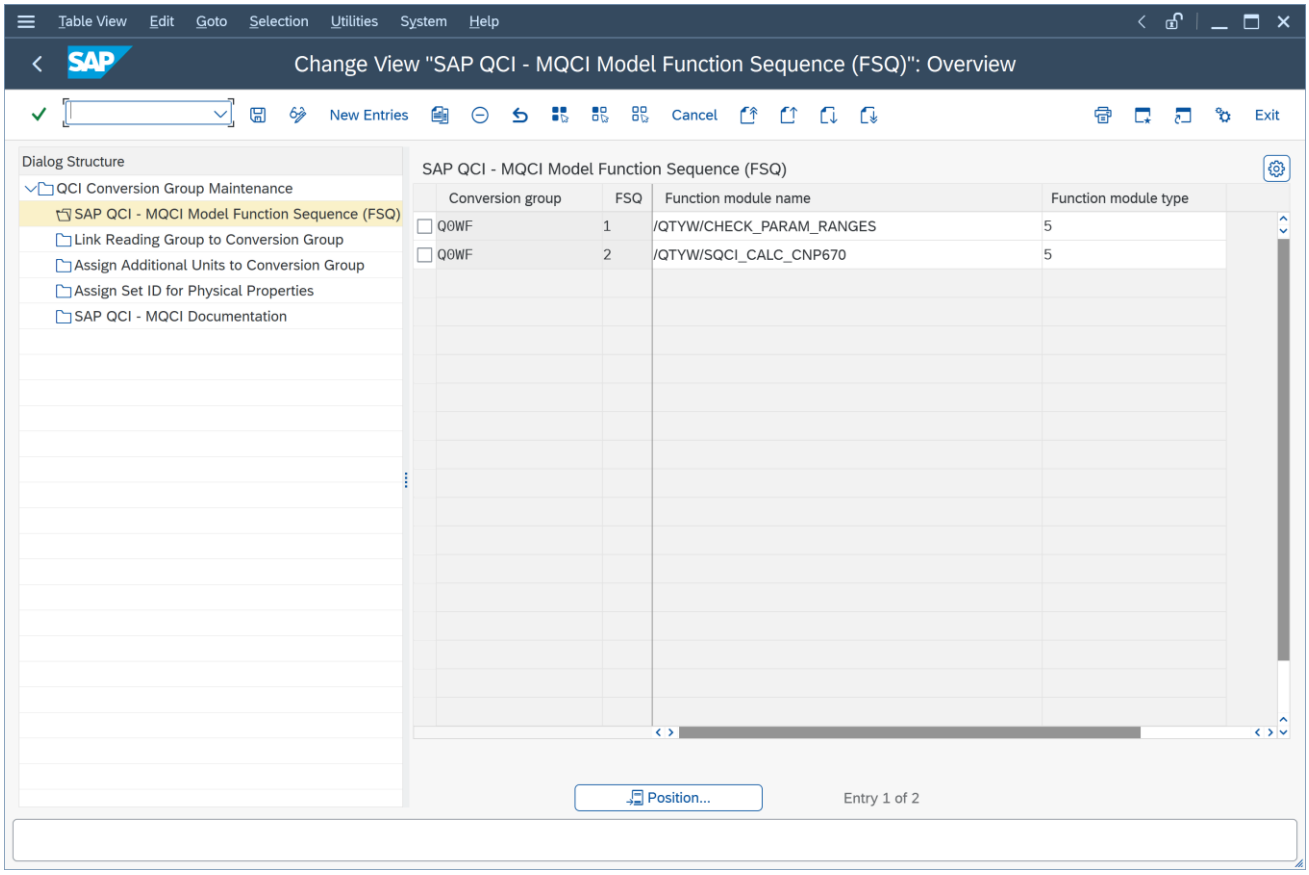
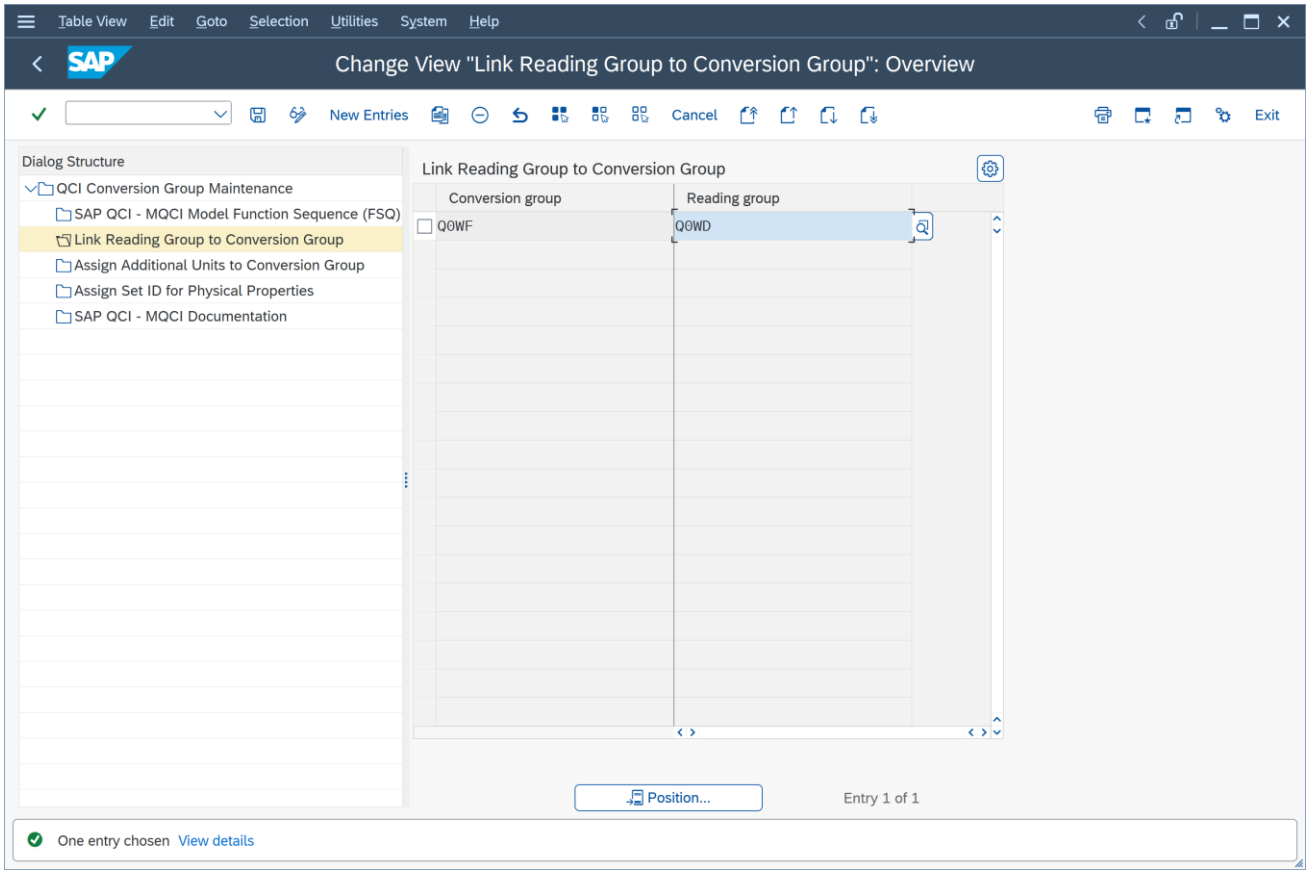


Table View Edit Goto Selection Utilities System Help
Change View "QCI Conversion Group Maintenance": Details
New Entries
Cancel
Exit
Dialog Structure
QCI Conversion Group Maintenance
SAP QCI - MQCI Model Function Sequence (FSQ)
Link Reading Group to Conversion Group
Assign Additional Units to Conversion Group
Assign Set ID for Physical Properties
SAP QCI - MQCI Documentation
Vol.correction
Second Volume Correction Factor (4 decimal places)
ASTM Table 1
Do not use ASTM Table 1 conversion factors
ASTM Tab.1 Ver.
Use ASTM D1250-80 version (Volume XI/XII Table 1)
CPL calc. logic
Apply CPL to NOV/NSV/GOV/GSV quantities - source qty. only
LPG specific settings
LPG dens. calc.
Not relevant
LPG Hval. calc.
Not relevant
LPG Hval. class
LPG st.vol.cor.
Do not correct standardized transaction volume for vap. cor.
LPG v.pr. calc.
Use input vapor pressure for dynamic CPL calculation
Calculation model rounding settings
Round base transaction quantity values(Base UoM rounding settings)
Round intermediate quantity values (Base UoM rounding settings)
Round base target quantity values (Base UoM rounding settings)
Round quantities and parameters within Model using statistician's rounding
Quantity tolerance level settings
Tolerance group
Qty.warning % high
0.100
Qty.warning % low
0.100
Qty error % high
0.500
Qty.error % low
0.500



Q0WF	1	/QTYW/CHECK_PARAM_RANGES	5
Q0WF	2	/QTYW/SQCI_CALC_CNP670	5



(Note: You have to maintain reading group Q0WD before you assign it here)

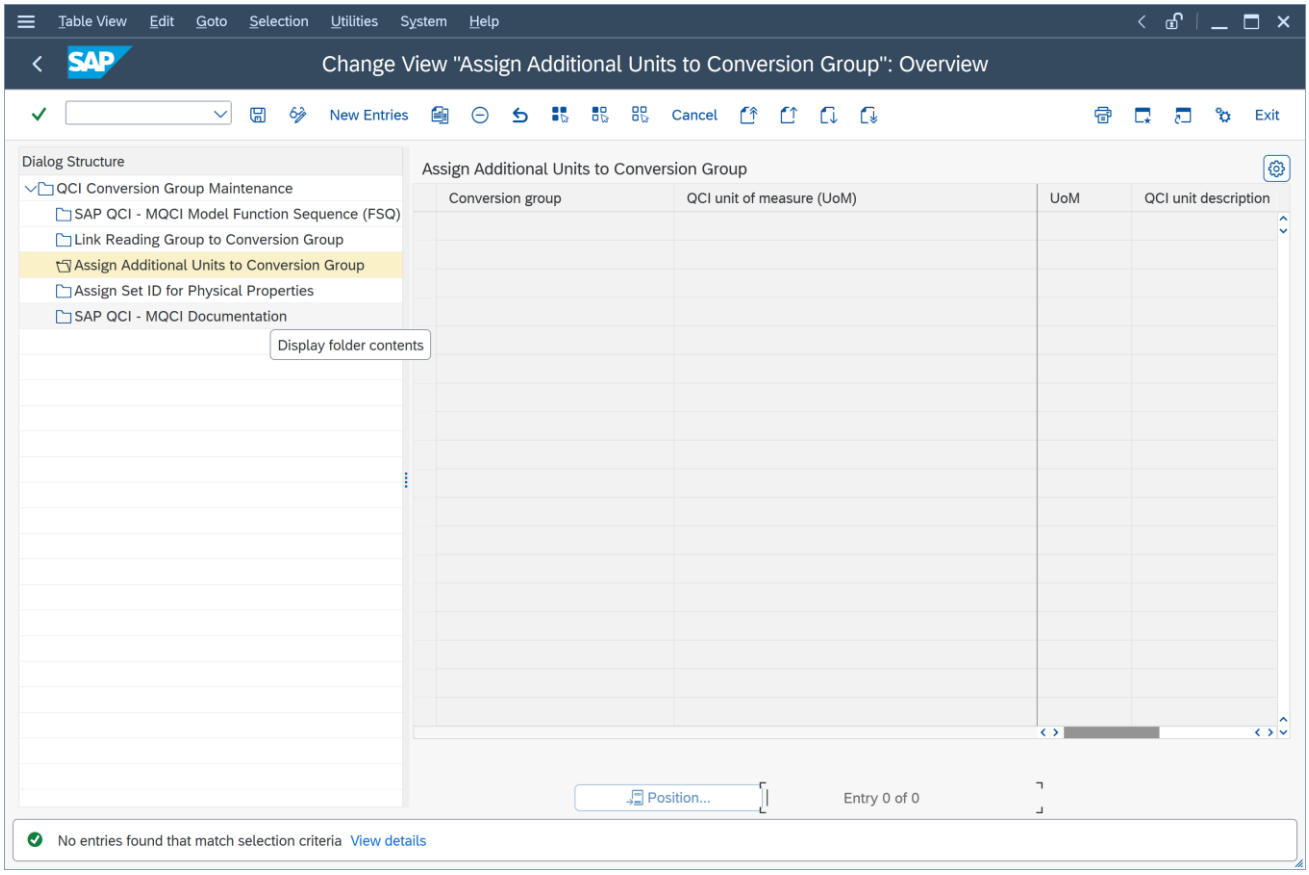


Table View Edit Goto Selection Utilities System Help
Change View "Assign Additional Units to Conversion Group": Overview
New Entries
Cancel
Exit
Dialog Structure
QCI Conversion Group Maintenance
SAP QCI - MQCI Model Function Sequence (FSQ)
Link Reading Group to Conversion Group
Assign Additional Units to Conversion Group
Assign Set ID for Physical Properties
SAP QCI - MQCI Documentation
Display folder contents
Assign Additional Units to Conversion Group
Conversion group
QCI unit of measure (UoM)
UoM
QCI unit description
Position...
Entry 0 of 0
No entries found that match selection criteria View details

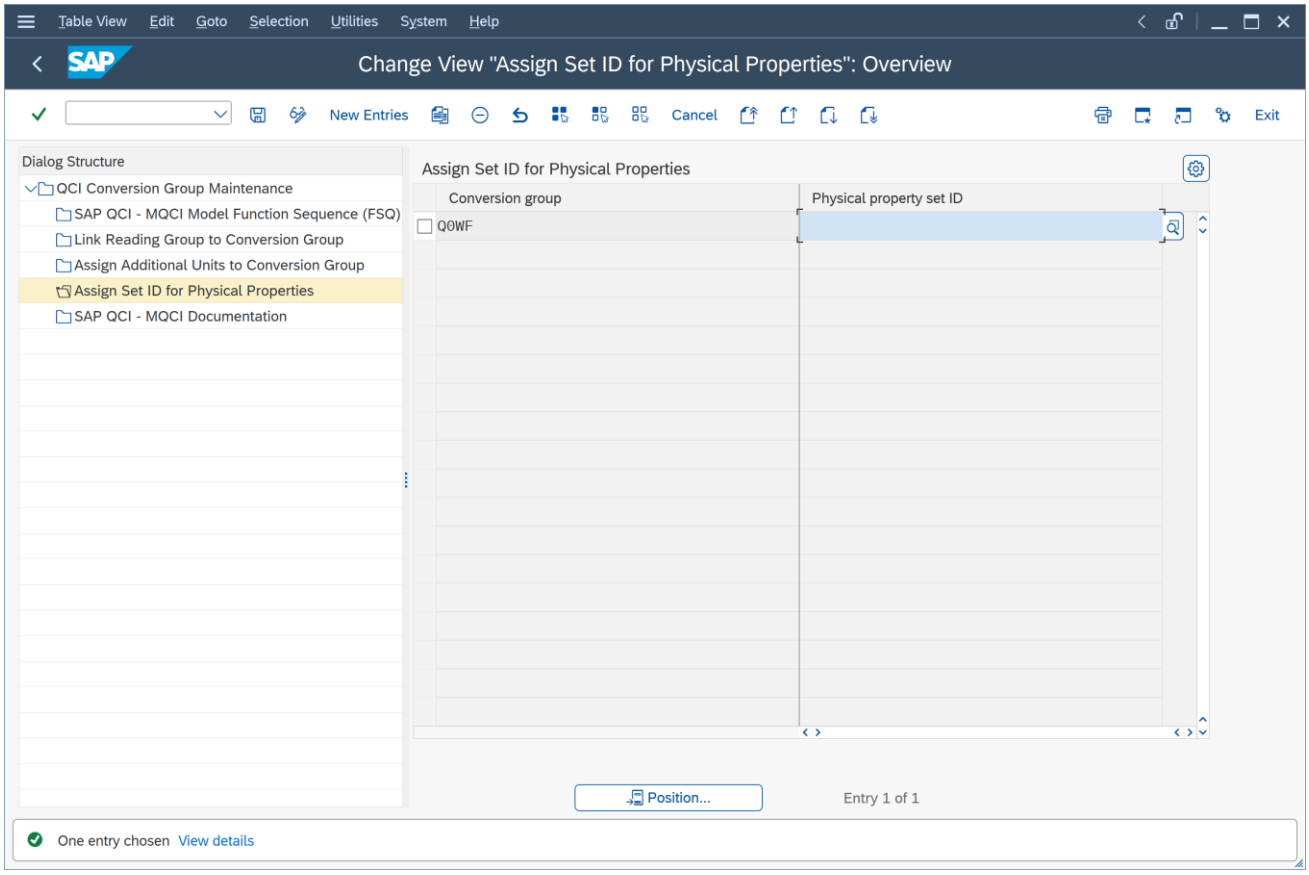


Table View Edit Goto Selection Utilities System Help
Change View "Assign Set ID for Physical Properties": Overview
New Entries
Cancel
Exit
Dialog Structure
QCI Conversion Group Maintenance
SAP QCI - MQCI Model Function Sequence (FSQ)
Link Reading Group to Conversion Group
Assign Additional Units to Conversion Group
Assign Set ID for Physical Properties
SAP QCI - MQCI Documentation
Assign Set ID for Physical Properties
Conversion group
Physical property set ID
Q0WF
Position...
Entry 1 of 1
One entry chosen View details

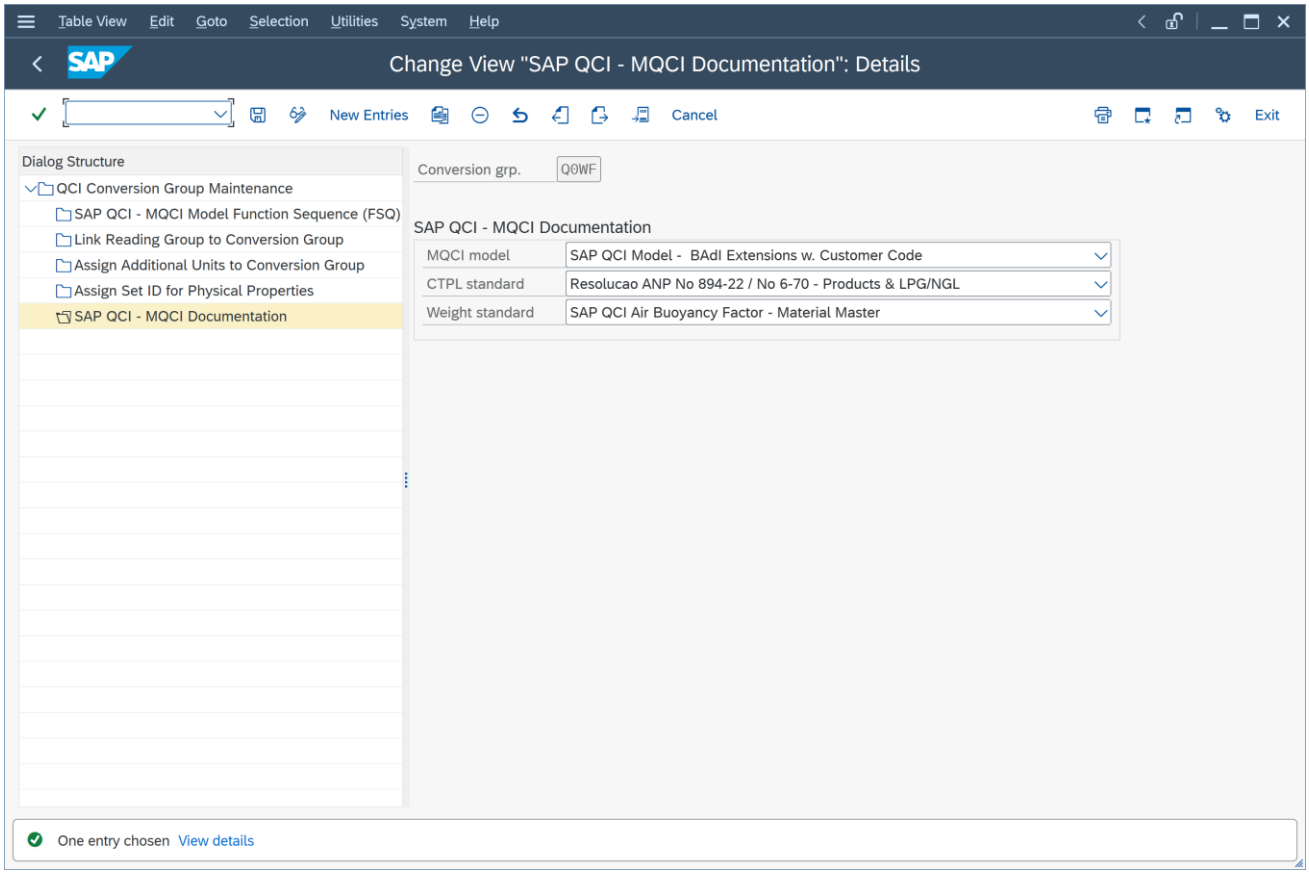
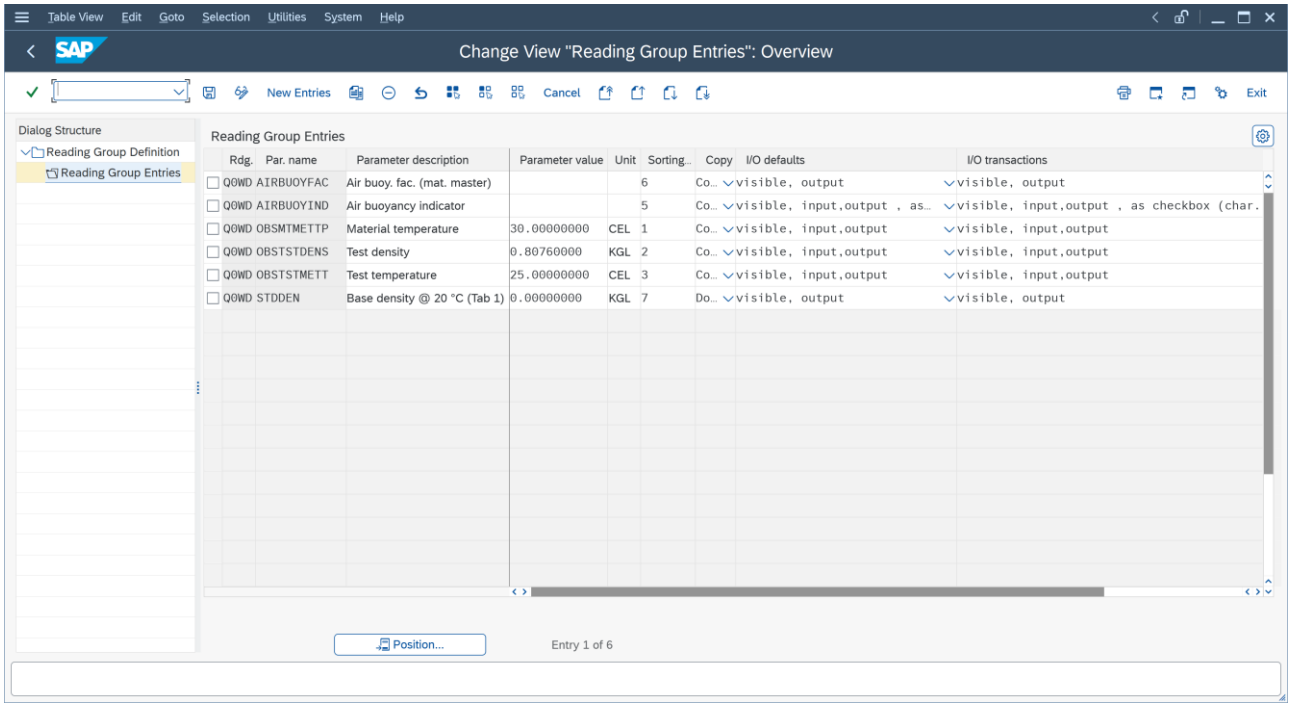


Table View Edit Goto Selection Utilities System Help
Change View "SAP QCI - MQCI Documentation": Details
New Entries
Cancel
Exit
Dialog Structure
QCI Conversion Group Maintenance
SAP QCI - MQCI Model Function Sequence (FSQ)
Link Reading Group to Conversion Group
Assign Additional Units to Conversion Group
Assign Set ID for Physical Properties
SAP QCI - MQCI Documentation
Conversion grp.
QOWF
SAP QCI - MQCI Documentation
MQCI model
SAP QCI Model - BAdI Extensions w. Customer Code
CTPL standard
Resolucao ANP No 894-22 / No 6-70 - Products & LPG/NGL
Weight standard
SAP QCI Air Buoyancy Factor - Material Master
One entry chosen
View details

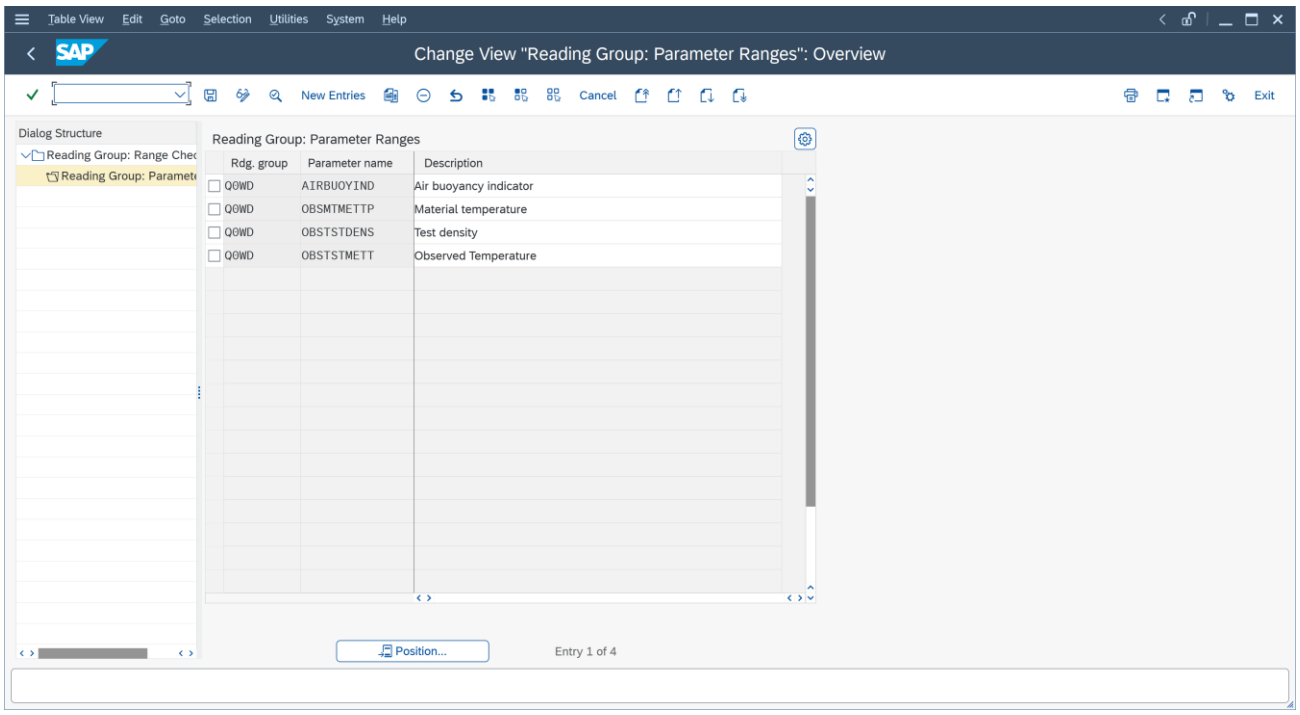
5.3.5. Q0WD Reading Group Configuration Details

Define reading group Q0WD – “RES. ANP NO 894-2022 / RES. NO 6-70” with the following entries:



5.3.6. Q0WD Range Group Configuration Details

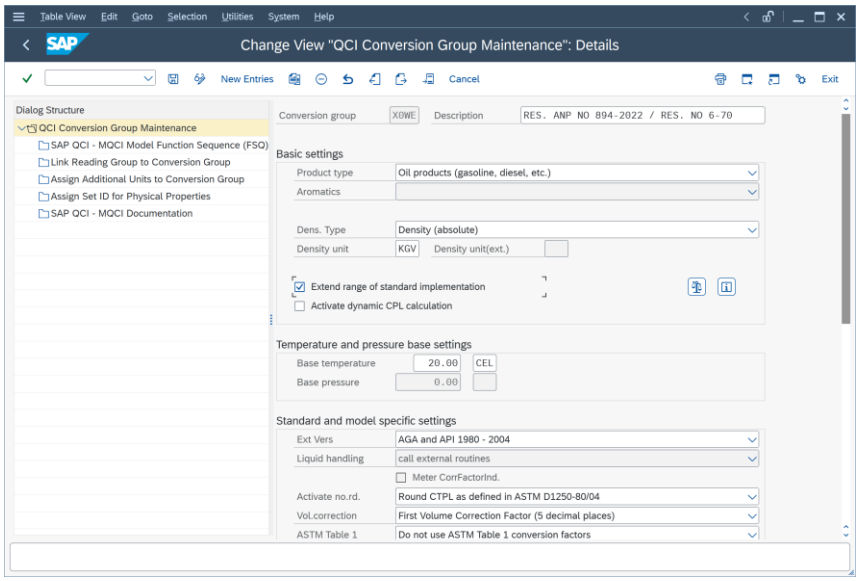
Define range group Q0WD – “RES. ANP NO 894-2022 / RES. NO 6-70” with the following entries:



Note: define appropriate range values for your products in your X/Y/Z*** copy of the new template conversion group.

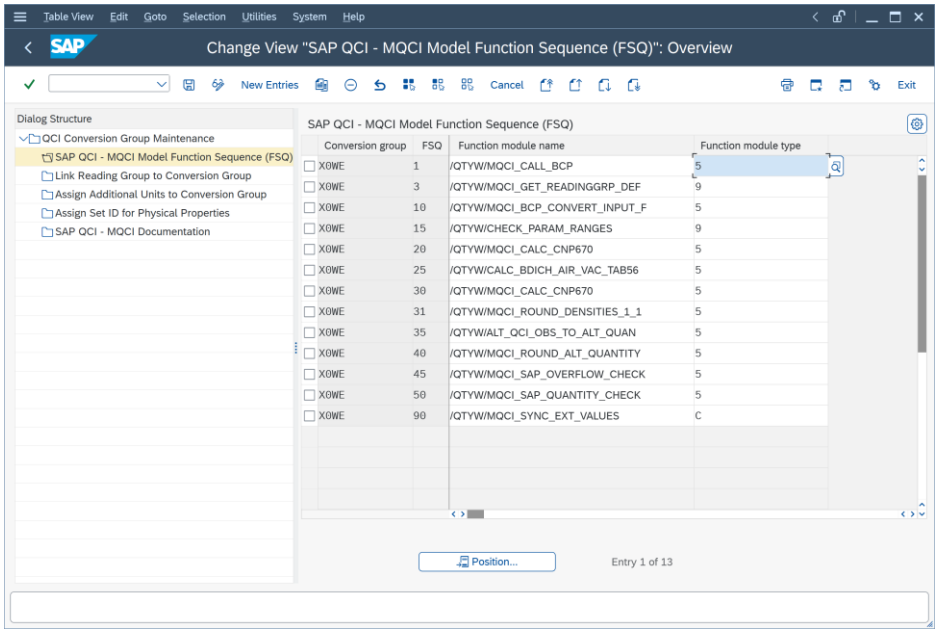
5.4. Alternate Calculation Approach – Configuration Settings

If you decide to utilize the alternate approach described in Chapter 3.2, you simply set the “extend range of standard implementation” in your conversion group.



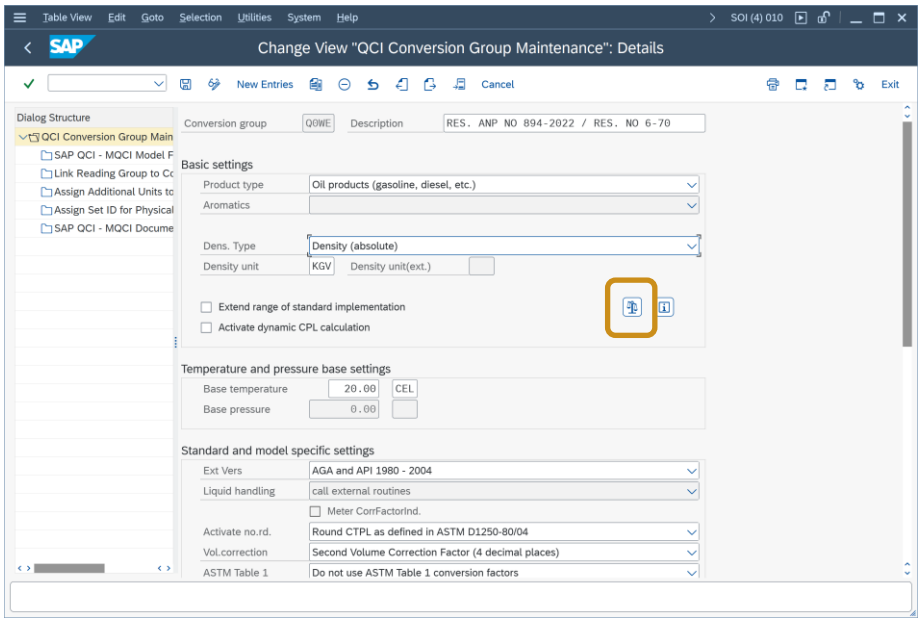
In the MQCI conversion group, you then must remove the two temperature rounding functions from the MQCI model function sequence:

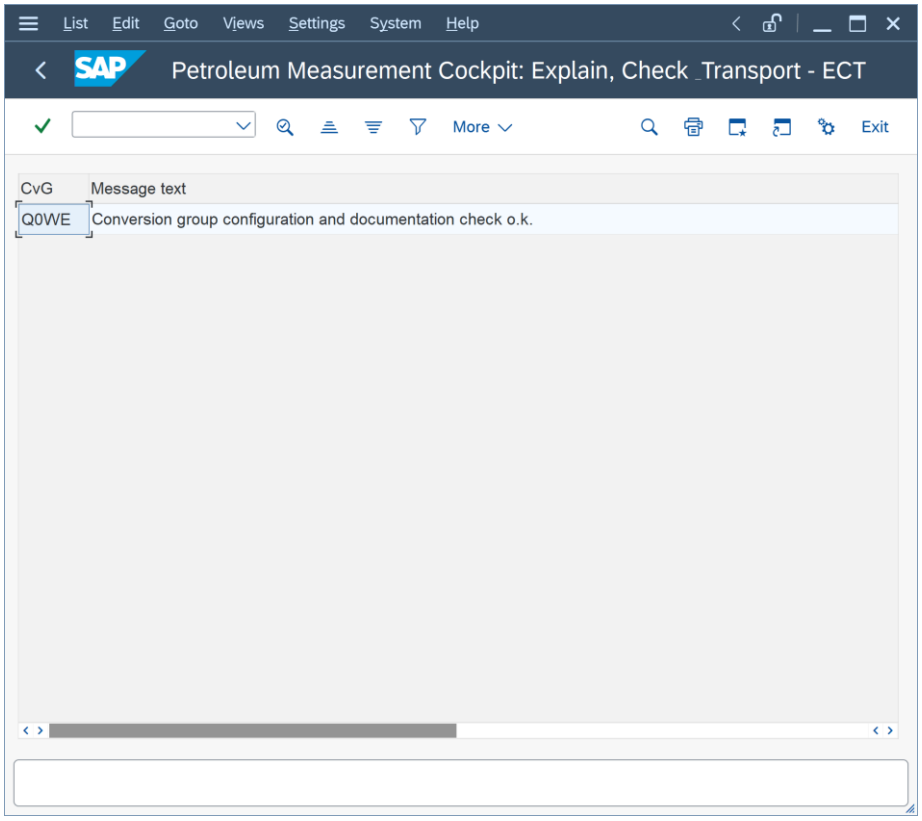
Q0WE	7	/QTYW/ROUND_TEST_TEMP_1_5	5
Q0WE	8	/QTYW/ROUND_MAT_TEMP_1_5	5



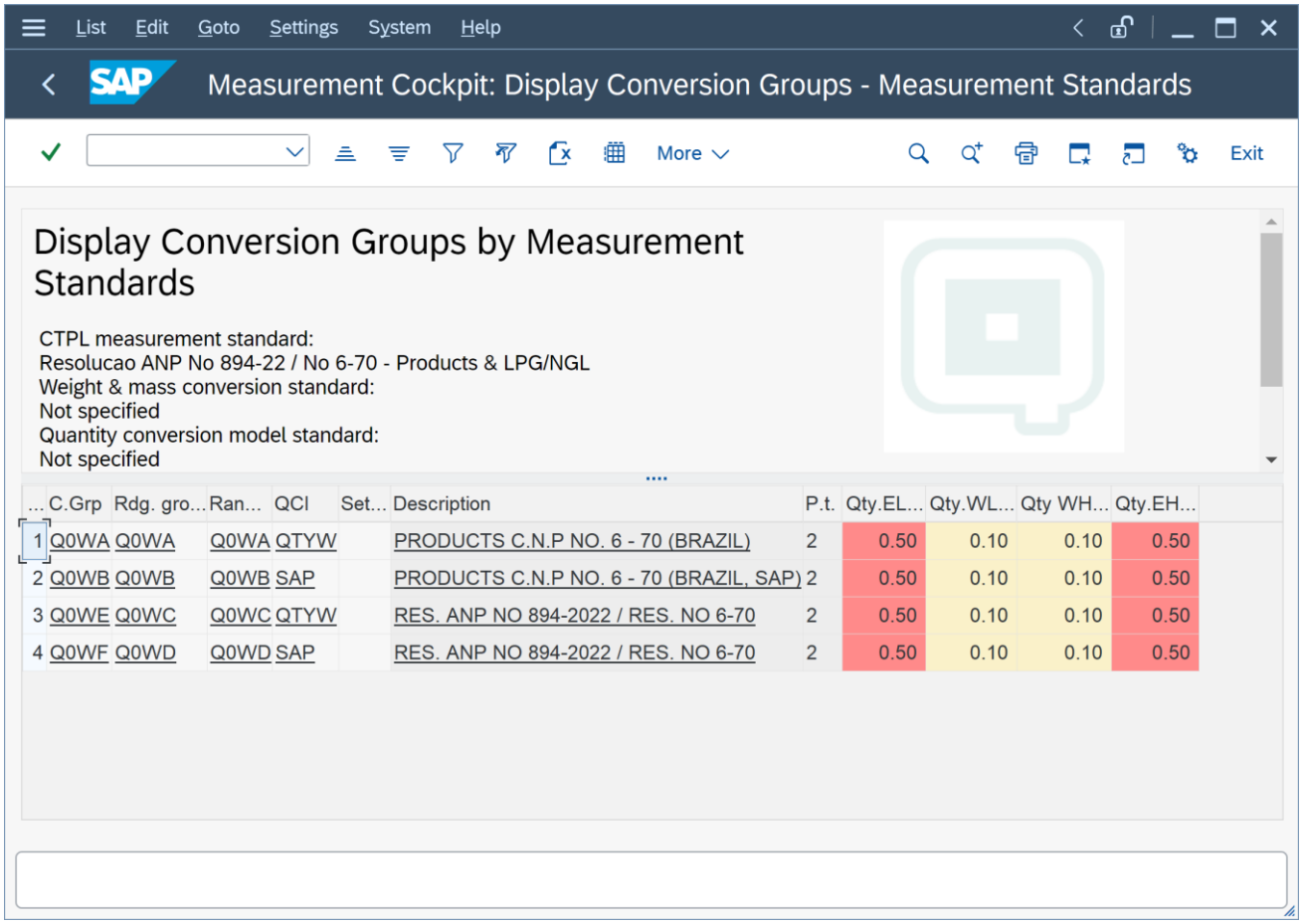
5.5. Conversion Group Configuration Check & Display

Finally, you should execute the conversion group configuration check for your two new template conversion groups:





In your template client 045, you are now able to display the two new template conversion groups Q0WE and Q0WF – together with the existing algorithm-based Table II conversion groups:



...	C.Grp	Rdg. gro...	Ran...	QCI	Set...	Description	P.t.	Qty.EL...	Qty.WL...	Qty WH...	Qty.EH...
1	Q0WA	Q0WA	Q0WA	QTYW		PRODUCTS C.N.P NO. 6 - 70 (BRAZIL)	2	0.50	0.10	0.10	0.50
2	Q0WB	Q0WB	Q0WB	SAP		PRODUCTS C.N.P NO. 6 - 70 (BRAZIL, SAP)	2	0.50	0.10	0.10	0.50
3	Q0WE	Q0WC	Q0WC	QTYW		RES. ANP NO 894-2022 / RES. NO 6-70	2	0.50	0.10	0.10	0.50
4	Q0WF	Q0WD	Q0WD	SAP		RES. ANP NO 894-2022 / RES. NO 6-70	2	0.50	0.10	0.10	0.50

6. Calculation Examples Table I & II

Once the conversion groups are configured correctly, you can start your own implementation tests – utilizing your copy into the X/Y/Z*** name range. QuantityWare has performed hundreds of internal tests; however, as stated above and documented in the Annex 2, due to quality issues and ambiguities originating from the quality of the standard, it is the customers' responsibility to perform rigorous testing and validations.

Here, we document some examples of our internal tests – which are also documented as internal test scenarios:

Reading Group Default Example:

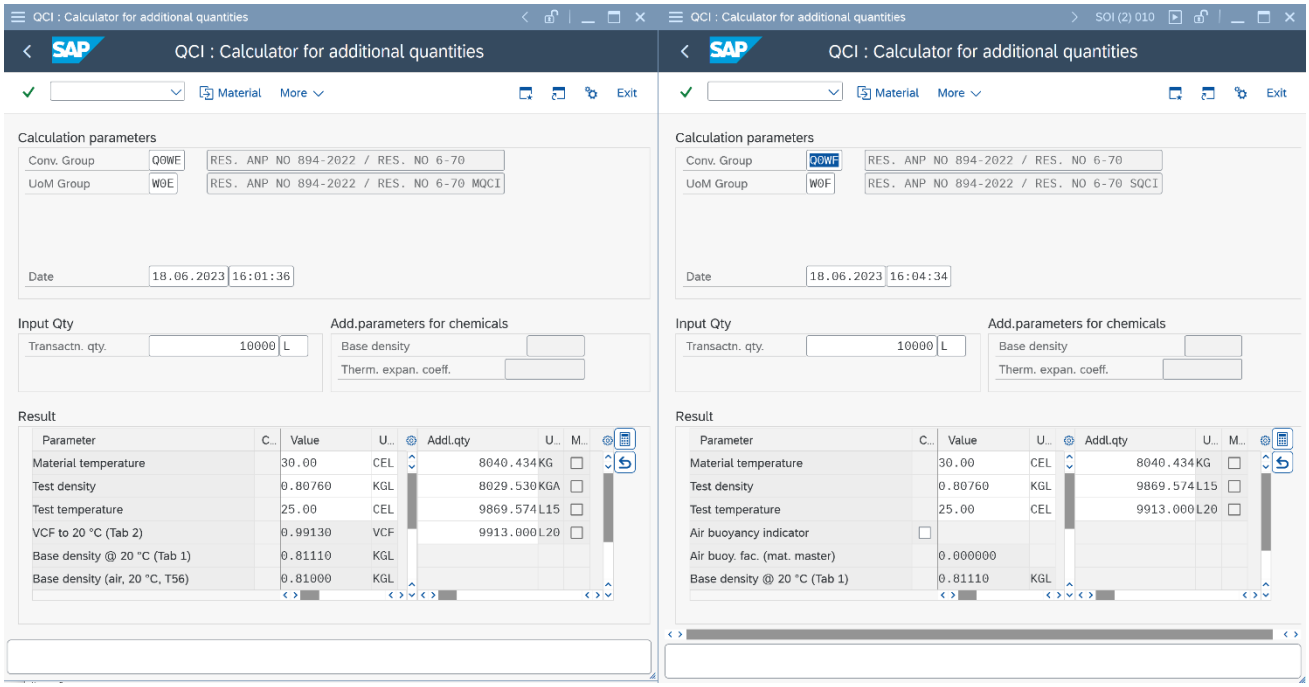


Table I Example:

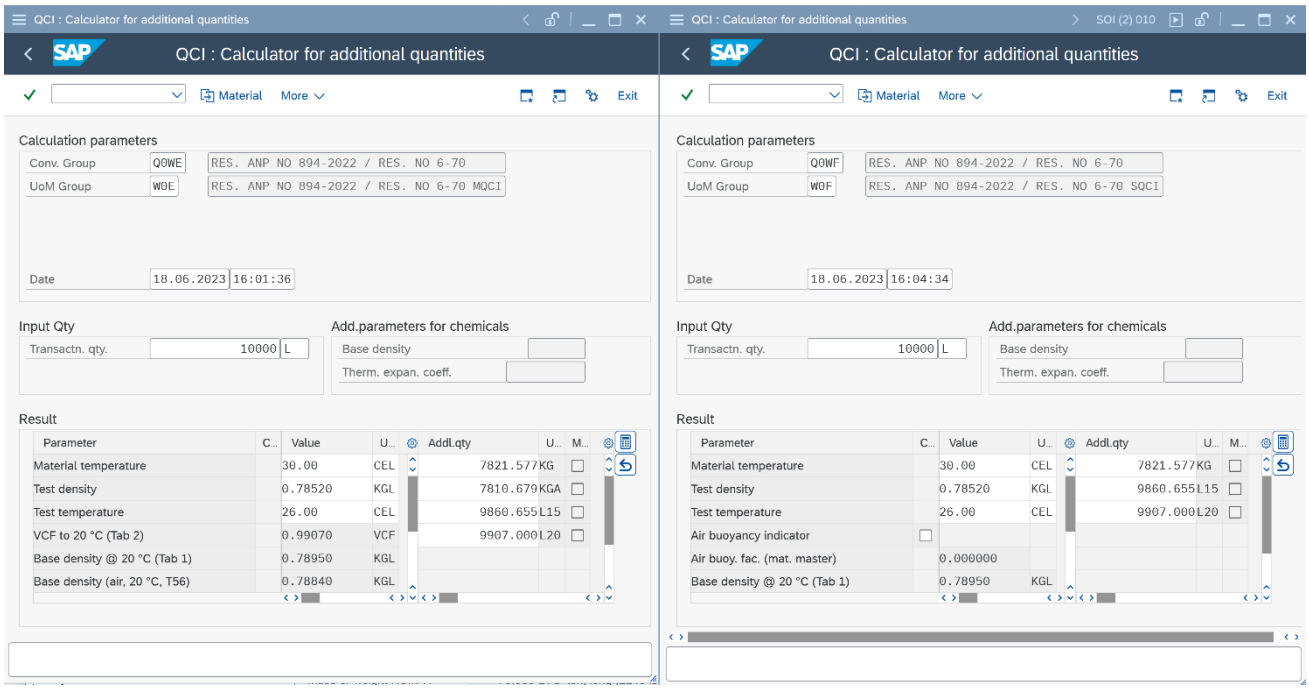
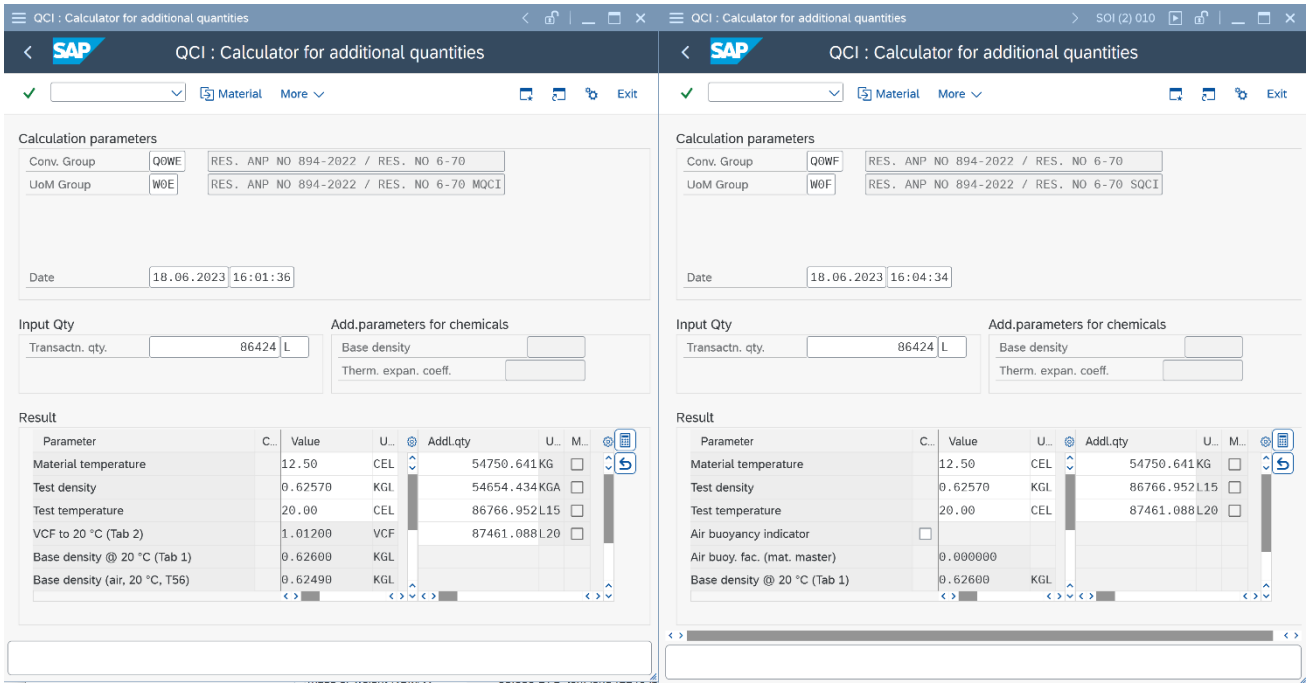
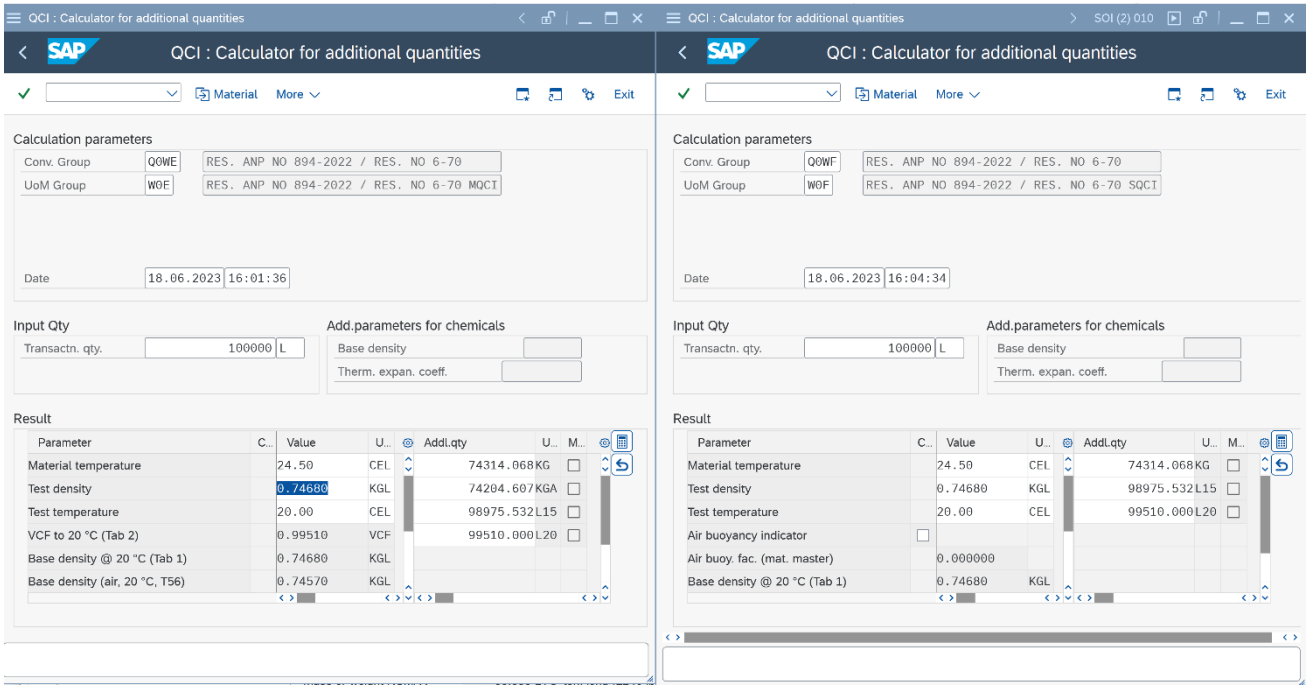


Table II Example 1:



Note that – as explained above – the base density is rounded to three decimals; although the test density is given at base temperature.

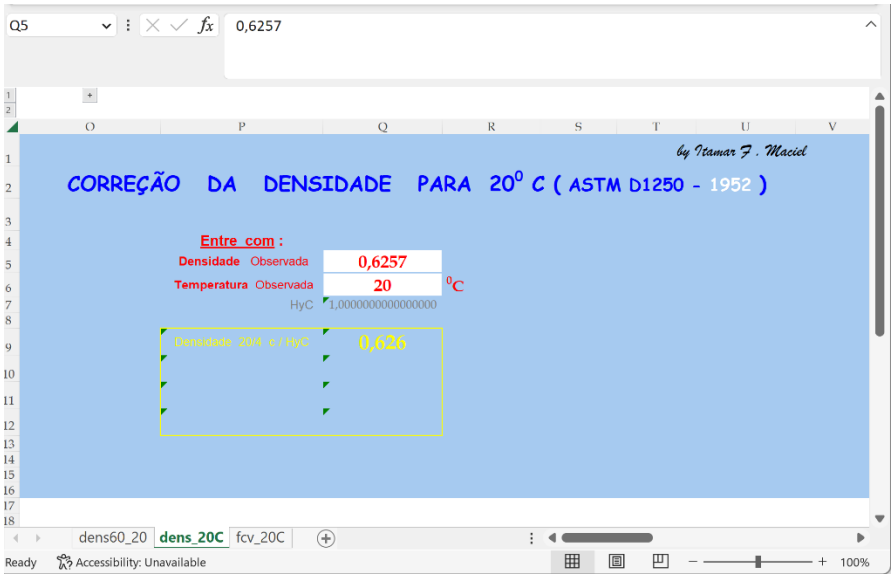
Table II Example 2:

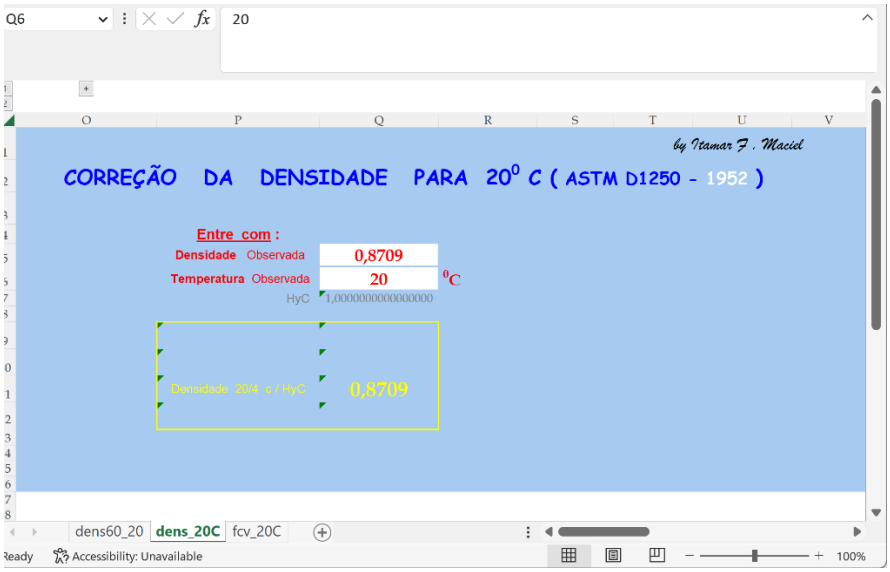


Annex 1. XLS Algorithm

In 2012, business experts from a Brazilian project team presented QuantityWare an XLS sheet, which apparently implements an algorithm-based solution for Table I and Table II:

Table I examples:





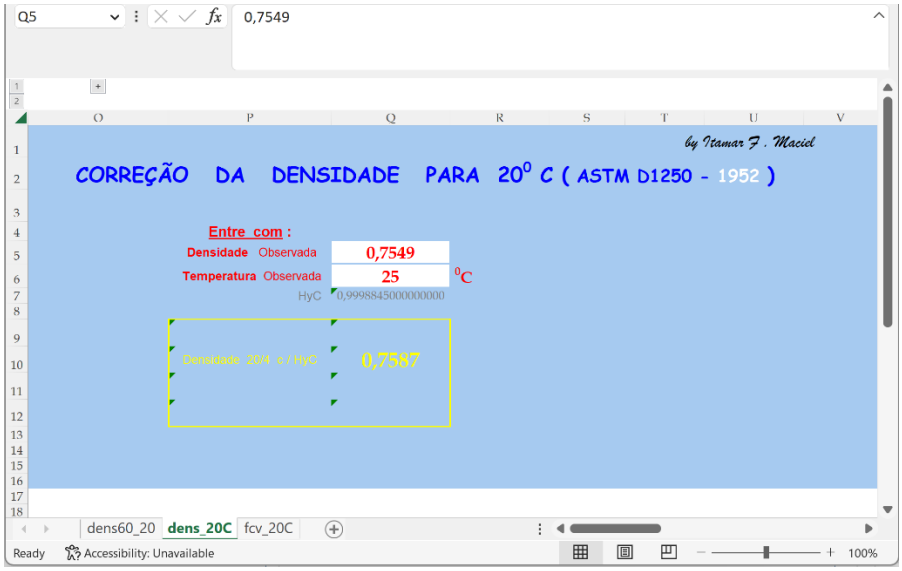
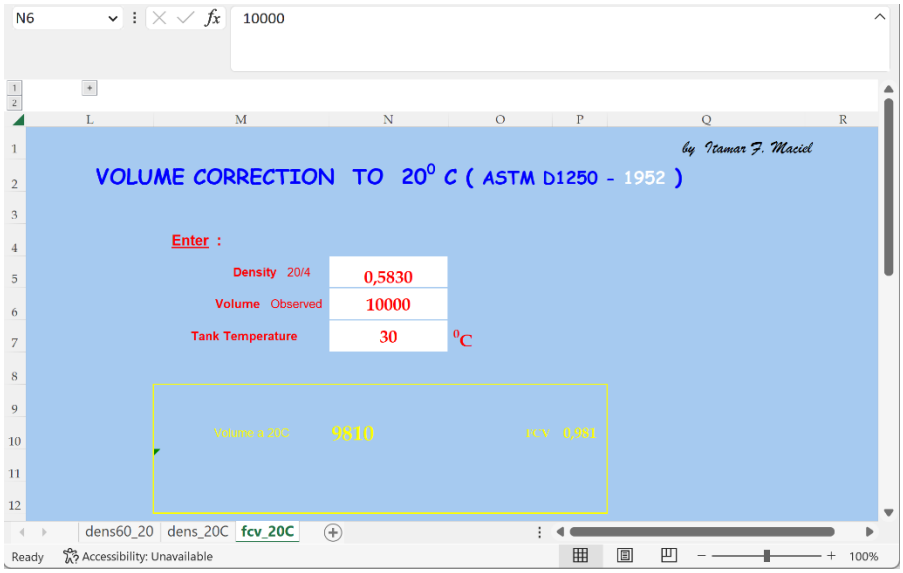
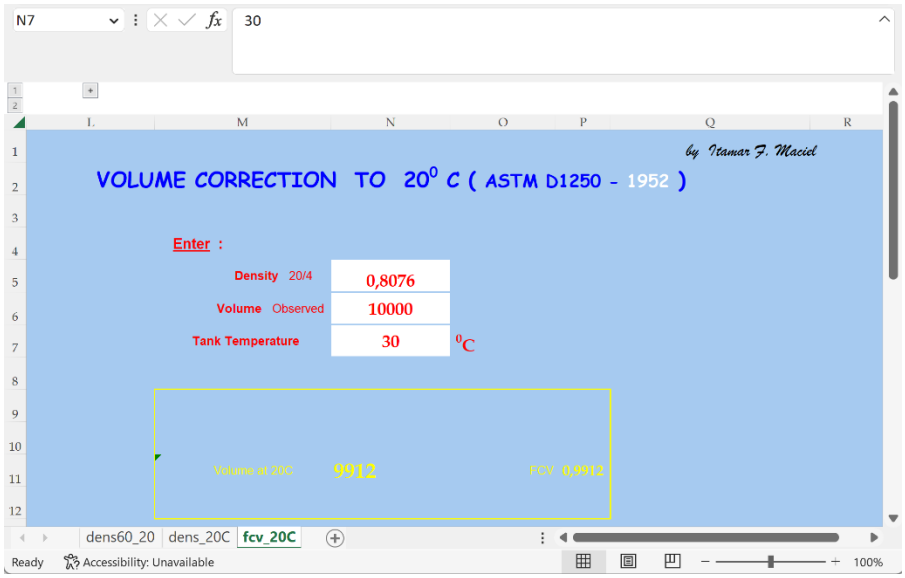


Table II examples:





QuantityWare has performed a detailed comparison analysis between these values and the printed values (the printed values being the standard). Since numerous differences have been detected for Table I values, as well as for Table II values, QuantityWare delivers the table value based solution with this AD.

As can be seen from the examples above, rounding of base densities (and VCF) for densities less than 0.650 to 3 decimals is performed, as suggested by the accuracy of the printed values; even if the observed density is available with higher accuracy at base temperature 20 °C or when interpolation is performed.

This appears to be a decision of the programmer who developed this XLS; caused by the ambiguity of the printed values in the PDF, which are accompanied with only 1 + 2 examples; as stated beforehand, the standard contains no rounding clarification at all.

Thus, QuantityWare has implemented the rounding in the same manner as defined in the Excel development, for this AD.

Annex 2. Standard Issues Detected

In this Annex, we list the major issues we found during conversion of the printed PDF values to computerized values.

Annex 2.a. Issue 1

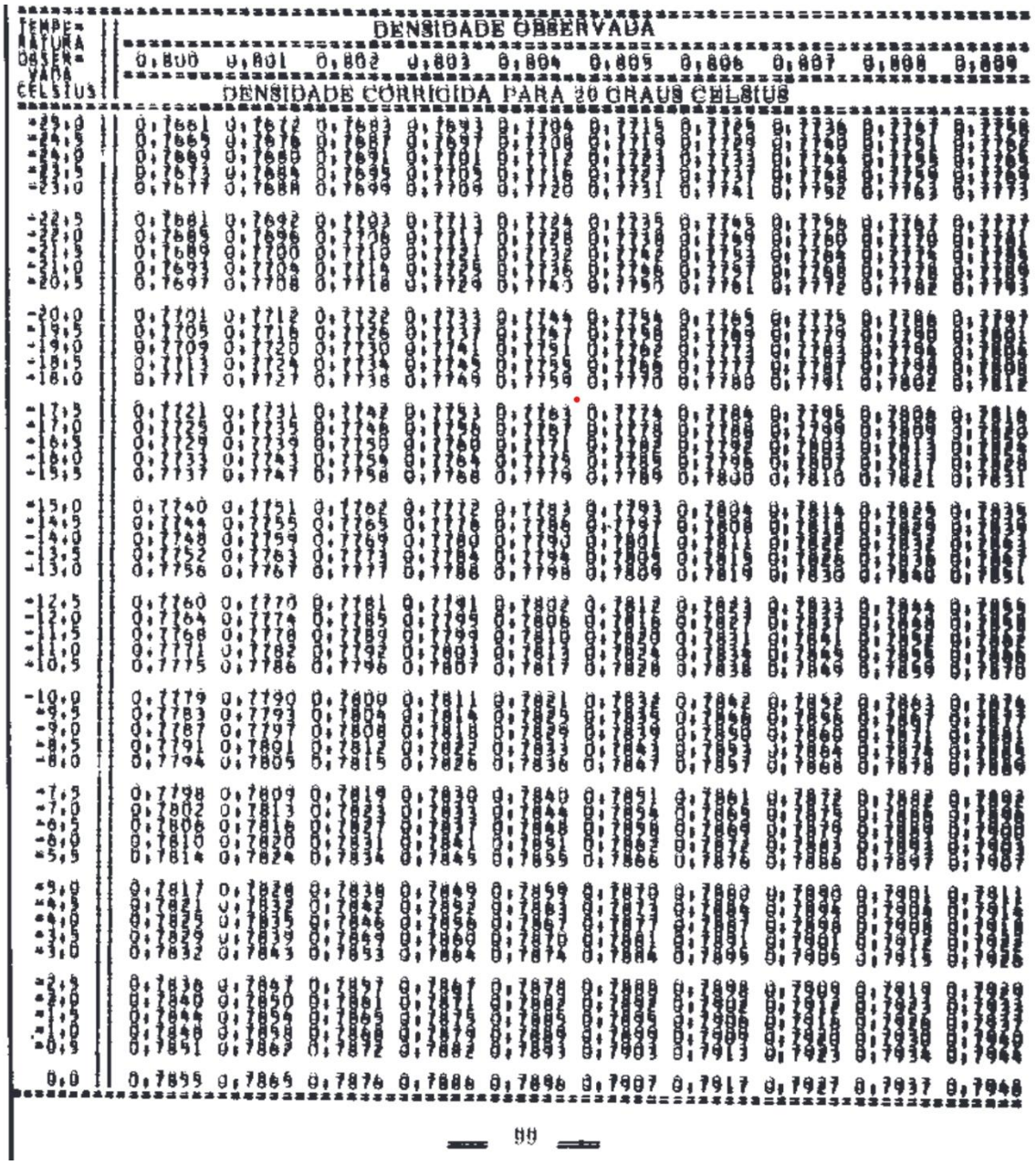
Table I contains many unrecognizable values:

55,5	0,7860	0,8106	0,8105	not exactly recognizable corrected as per formula
30,5	0,6590	0,6685		not exactly recognizable corrected as per formula
31,5	0,6590	0,6694		not exactly recognizable corrected as per formula
-22	0,8020	0,7706		not exactly recognizable corrected as per formula
-21	0,8020	0,7715		not exactly recognizable corrected as per formula
-17	0,8030	0,7756		not exactly recognizable corrected as

				per formula corrected as per formula
-20	0,8050	0,7755		not exactly recognizable corrected as per formula
-13,5	0,8050	0,7804		not exactly recognizable corrected as per formula
-1,5	0,8050	0,7895		not exactly recognizable corrected as per formula
-18	0,8060	0,7780		not exactly recognizable corrected as per formula
-5,5	0,8070	0,7886		not exactly recognizable corrected as per formula
-21,5	0,8080	0,7775		not exactly recognizable corrected as per formula

Annex 2.b. Issue 2

Table 1 page 99 is as such unreadable



Annex 2.c. Issue 3

As shown below, rounding to 3 decimals for values below 0.650 is not a clearly defined rule … in reference to page 42, a rounding on temperatures between 21,5°C and 24.5°C to 4 decimals is applied. Also duplicate-reported base densities with different values between page 42 & 43 for 25°C may lead to a misinterpretation of this standard.

20,0	0,640	0,641	0,642	0,643	0,644	0,645	0,646	0,647	0,648	0,649
20,5	0,640	0,641	0,642	0,643	0,644	0,645	0,646	0,647	0,648	0,649
21,0	0,641	0,642	0,643	0,644	0,645	0,646	0,647	0,648	0,649	0,650
21,5	0,6414	0,6424	0,6434	0,6444	0,6454	0,6464	0,6474	0,6484	0,6494	0,6504
22,0	0,6419	0,6429	0,6439	0,6449	0,6459	0,6469	0,6479	0,6489	0,6498	0,6508
22,5	0,6423	0,6433	0,6443	0,6453	0,6463	0,6473	0,6483	0,6493	0,6503	0,6513
23,0	0,6428	0,6438	0,6448	0,6458	0,6468	0,6478	0,6488	0,6498	0,6508	0,6518
23,5	0,6433	0,6443	0,6453	0,6463	0,6473	0,6482	0,6492	0,6502	0,6512	0,6522
24,0	0,6437	0,6447	0,6457	0,6467	0,6477	0,6487	0,6497	0,6507	0,6517	0,6527
24,5	0,6442	0,6452	0,6462	0,6472	0,6482	0,6492	0,6502	0,6512	0,6521	0,6531
25,0	0,6447	0,6457	0,6467	0,6476	0,6486	0,6496	0,6506	0,6516	0,6526	0,6536

TABELA I

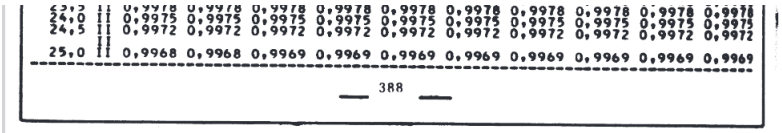
CONVERSÃO DE DENSIDADE PARA 20 GRAUS CELSIUS

0,640 A 0,649
25,0 A 50,0

TEMPERATURA OBSERVADA CELSIUS	DENSIDADE OBSERVADA									
	0,640	0,641	0,642	0,643	0,644	0,645	0,646	0,647	0,648	0,649
	DENSIDADE CORRIGIDA PARA 20 GRAUS CELSIUS									
25,0	0,645	0,646	0,647	0,648	0,649	0,650	0,6506	0,6516	0,6526	0,6536
25,5	0,645	0,646	0,647	0,648	0,649	0,6501	0,6511	0,6521	0,6531	0,6540
26,0	0,646	0,647	0,648	0,649	0,650	0,6505	0,6515	0,6525	0,6535	0,6545
26,5	0,646	0,647	0,648	0,649	0,650	0,6510	0,6520	0,6530	0,6540	0,6550
27,0	0,647	0,648	0,648	0,649	0,6505	0,6515	0,6524	0,6534	0,6544	0,6554
27,5	0,647	0,648	0,649	0,650	0,6509	0,6519	0,6529	0,6539	0,6549	0,6559

Annex 2.d. Issue 4

Table 2 page 389 is a mistakenly scanned page 141, thus page 389 has been reconstructed through use of our formula solution.



24,0	0,9975	0,9975	0,9975	0,9975	0,9975	0,9975	0,9975	0,9975	0,9975	0,9975
24,5	0,9972	0,9972	0,9972	0,9972	0,9972	0,9972	0,9972	0,9972	0,9972	0,9972
25,0	0,9968	0,9968	0,9969	0,9969	0,9969	0,9969	0,9969	0,9969	0,9969	0,9969

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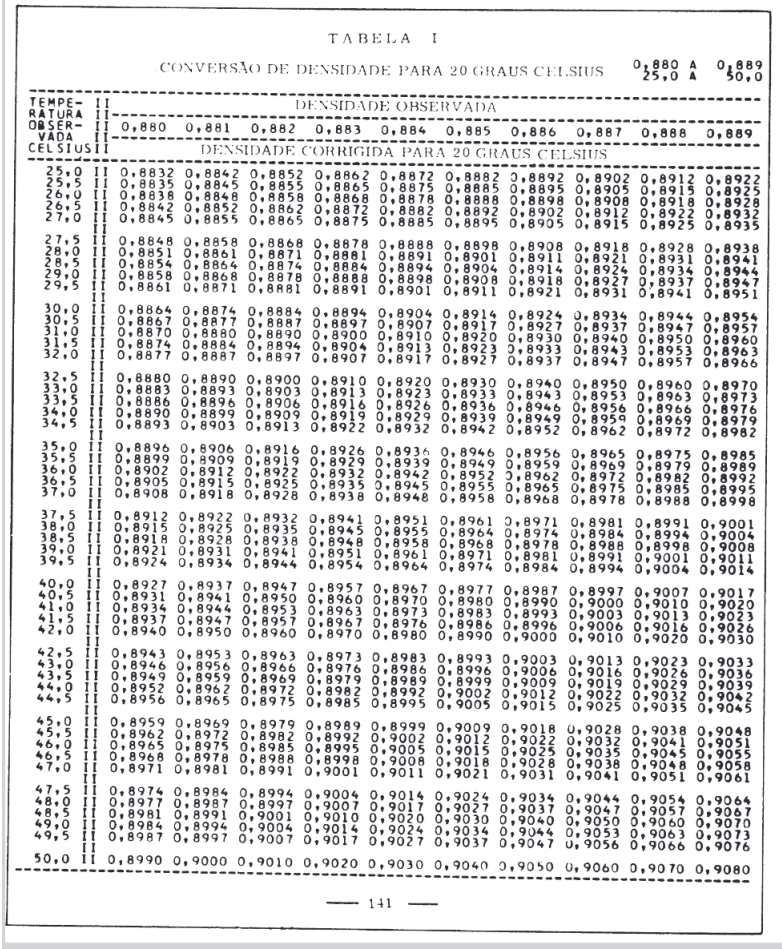

TABELA I

CONVERSÃO DE DENSIDADE PARA 20 GRAUS CELSIUS — 0,880 A 0,889 / 25,0 A 50,0

TEMPERATURA OBSERVADA CELSIUS	DENSIDADE OBSERVADA									
	0,880	0,881	0,882	0,883	0,884	0,885	0,886	0,887	0,888	0,889
	DENSIDADE CORRIGIDA PARA 20 GRAUS CELSIUS									
25,0	0,8832	0,8842	0,8852	0,8862	0,8872	0,8882	0,8892	0,8902	0,8912	0,8922
25,5	0,8835	0,8845	0,8855	0,8865	0,8875	0,8885	0,8895	0,8905	0,8915	0,8925
26,0	0,8838	0,8848	0,8858	0,8868	0,8878	0,8888	0,8898	0,8908	0,8918	0,8928
26,5	0,8842	0,8852	0,8862	0,8872	0,8882	0,8892	0,8902	0,8912	0,8922	0,8932
27,0	0,8845	0,8855	0,8865	0,8875	0,8885	0,8895	0,8905	0,8915	0,8925	0,8935
27,5	0,8848	0,8858	0,8868	0,8878	0,8888	0,8898	0,8908	0,8918	0,8928	0,8938
28,0	0,8851	0,8861	0,8871	0,8881	0,8891	0,8901	0,8911	0,8921	0,8931	0,8941
28,5	0,8854	0,8864	0,8874	0,8884	0,8894	0,8904	0,8914	0,8924	0,8934	0,8944
29,0	0,8858	0,8868	0,8878	0,8888	0,8898	0,8908	0,8918	0,8927	0,8937	0,8947
29,5	0,8861	0,8871	0,8881	0,8891	0,8901	0,8911	0,8921	0,8931	0,8941	0,8951
30,0	0,8864	0,8874	0,8884	0,8894	0,8904	0,8914	0,8924	0,8934	0,8944	0,8954
30,5	0,8867	0,8877	0,8887	0,8897	0,8907	0,8917	0,8927	0,8937	0,8947	0,8957
31,0	0,8870	0,8880	0,8890	0,8900	0,8910	0,8920	0,8930	0,8940	0,8950	0,8960
31,5	0,8874	0,8884	0,8894	0,8904	0,8913	0,8923	0,8933	0,8943	0,8953	0,8963
32,0	0,8877	0,8887	0,8897	0,8907	0,8917	0,8927	0,8937	0,8947	0,8957	0,8966
32,5	0,8880	0,8890	0,8900	0,8910	0,8920	0,8930	0,8940	0,8950	0,8960	0,8970
33,0	0,8883	0,8893	0,8903	0,8913	0,8923	0,8933	0,8943	0,8953	0,8963	0,8973
33,5	0,8886	0,8896	0,8906	0,8916	0,8926	0,8936	0,8946	0,8956	0,8966	0,8976
34,0	0,8890	0,8899	0,8909	0,8919	0,8929	0,8939	0,8949	0,8959	0,8969	0,8979
34,5	0,8893	0,8903	0,8913	0,8922	0,8932	0,8942	0,8952	0,8962	0,8972	0,8982
35,0	0,8896	0,8906	0,8916	0,8926	0,8936	0,8946	0,8956	0,8965	0,8975	0,8985
35,5	0,8899	0,8909	0,8919	0,8929	0,8939	0,8949	0,8959	0,8969	0,8979	0,8989
36,0	0,8902	0,8912	0,8922	0,8932	0,8942	0,8952	0,8962	0,8972	0,8982	0,8992
36,5	0,8905	0,8915	0,8925	0,8935	0,8945	0,8955	0,8965	0,8975	0,8985	0,8995
37,0	0,8908	0,8918	0,8928	0,8938	0,8948	0,8958	0,8968	0,8978	0,8988	0,8998
37,5	0,8912	0,8922	0,8932	0,8941	0,8951	0,8961	0,8971	0,8981	0,8991	0,9001
38,0	0,8915	0,8925	0,8935	0,8945	0,8955	0,8964	0,8974	0,8984	0,8994	0,9004
38,5	0,8918	0,8928	0,8938	0,8948	0,8958	0,8968	0,8978	0,8988	0,8998	0,9008
39,0	0,8921	0,8931	0,8941	0,8951	0,8961	0,8971	0,8981	0,8991	0,9001	0,9011
39,5	0,8924	0,8934	0,8944	0,8954	0,8964	0,8974	0,8984	0,8994	0,9004	0,9014
40,0	0,8927	0,8937	0,8947	0,8957	0,8967	0,8977	0,8987	0,8997	0,9007	0,9017
40,5	0,8931	0,8941	0,8950	0,8960	0,8970	0,8980	0,8990	0,9000	0,9010	0,9020
41,0	0,8934	0,8944	0,8953	0,8963	0,8973	0,8983	0,8993	0,9003	0,9013	0,9023
41,5	0,8937	0,8947	0,8957	0,8967	0,8976	0,8986	0,8996	0,9006	0,9016	0,9026
42,0	0,8940	0,8950	0,8960	0,8970	0,8980	0,8990	0,9000	0,9010	0,9020	0,9030
42,5	0,8943	0,8953	0,8963	0,8973	0,8983	0,8993	0,9003	0,9013	0,9023	0,9033
43,0	0,8946	0,8956	0,8966	0,8976	0,8986	0,8996	0,9006	0,9016	0,9026	0,9036
43,5	0,8949	0,8959	0,8969	0,8979	0,8989	0,8999	0,9009	0,9019	0,9029	0,9039
44,0	0,8952	0,8962	0,8972	0,8982	0,8992	0,9002	0,9012	0,9022	0,9032	0,9042
44,5	0,8956	0,8965	0,8975	0,8985	0,8995	0,9005	0,9015	0,9025	0,9035	0,9045
45,0	0,8959	0,8969	0,8979	0,8989	0,8999	0,9009	0,9018	0,9028	0,9038	0,9048
45,5	0,8962	0,8972	0,8982	0,8992	0,9002	0,9012	0,9022	0,9032	0,9041	0,9051
46,0	0,8965	0,8975	0,8985	0,8995	0,9005	0,9015	0,9025	0,9035	0,9045	0,9055
46,5	0,8968	0,8978	0,8988	0,8998	0,9008	0,9018	0,9028	0,9038	0,9048	0,9058
47,0	0,8971	0,8981	0,8991	0,9001	0,9011	0,9021	0,9031	0,9041	0,9051	0,9061
47,5	0,8974	0,8984	0,8994	0,9004	0,9014	0,9024	0,9034	0,9044	0,9054	0,9064
48,0	0,8977	0,8987	0,8997	0,9007	0,9017	0,9027	0,9037	0,9047	0,9057	0,9067
48,5	0,8981	0,8991	0,9001	0,9010	0,9020	0,9030	0,9040	0,9050	0,9060	0,9070
49,0	0,8984	0,8994	0,9004	0,9014	0,9024	0,9034	0,9044	0,9053	0,9063	0,9073
49,5	0,8987	0,8997	0,9007	0,9017	0,9027	0,9037	0,9047	0,9056	0,9066	0,9076
50,0	0,8990	0,9000	0,9010	0,9020	0,9030	0,9040	0,9050	0,9060	0,9070	0,9080

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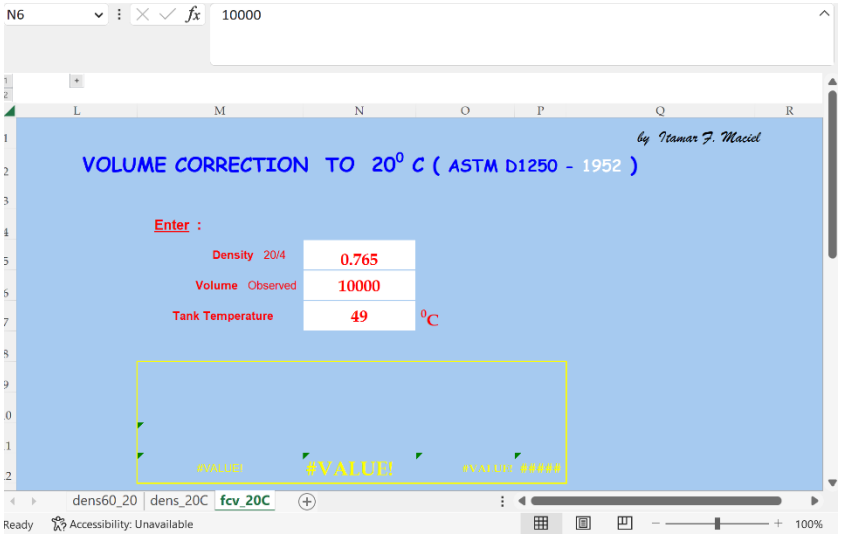
Annex 2.e. Issue 5

Excel (XLS) issues:

The formula-based XLS solution leads to a zero value on the table 1 integration for several use cases, e.g.:



add_test `'49' '0.765' '0.786'.` "... there is an error in the excel and in the function leading to a zero result

add_test `'0.0 ' '0.5450 ' '0.5180 '.` "... there is an error in the excel and in the function leading to a zero result

These are two examples of many more occurring, and which are consequently also occurring in the ABAP algorithm based solution. This is another technical reason why the table value based solution has to be utilized – it is the standard and defined for all possible values.

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