

Note: 000055

Overview

Number	000055
Description	ASTM Table 1 – Base Skipping – Calculation Model Extensions
Version	3 from 10.07.2017
Status	Released to Customer
Language	EN
Responsible	Markus Seng
Product	BCS
Category	Consulting & Configuration

Symptom

All SAP QCI and MQCI conversion groups perform two UoM conversions between UoM of the same SAP dimension during complex quantity conversions, where a transaction value & UoM (gross or net volume, mass or weight) at observed temperature is converted to a target value & UoM (gross or net volume, mass or weight) at alternate temperature.

The UoM conversions are performed via the coherent set of base conversion UoM. This set of base conversion UoM is defined on conversion group level. SAP QCI conversion groups always use the SI UoM as base conversion UoM and two UoM conversions via the SAP UoM CUNI conversion factors, which are symmetric.

MQCI conversion groups can also be configured to utilize UoM conversions - between UoM of the same SAP dimension (DIMID) - using ASTM Table 1 conversion factors, which are defined for various UoM combinations for volume to volume and weight to weight conversions. However, ASTM Table 1 conversion factors are not symmetric.

Example: If you convert 1,000,000 gallons (SAP UoM UGL) at an observed temperature of 60 °F to the base conversion UoM barrel (BBL), the system multiplies 1,000,000 by 0.023 809 52 (ASTM Table 1 (2008)) to obtain an internal barrel (BBL) value of 23,809.52. In a second calculation step the internal barrel value is converted to standard gallons (SAP UoM UG6) by multiplying this value with 42, which leads to a UG6 value of 999,999.84. $1/42$ cannot be represented as a finite decimal number, like many other ASTM Table 1 conversion factors.

This effect can be avoided by selecting the “base skipping” setting for a conversion group. Then, if the ASTM Table 1 mapping table contains an entry mapping UG6 to UGL, the two UoM conversions are not performed. However, this base skipping is only possible for combinations of net volume UoM which only differ by their temperature specification - the 0 step UoM conversion case (until BCS 10B CSP03). The 1 step UoM conversion case was so far not available via base skipping.

Example: You utilize a conversion group where the ASTM Table 1 conversion is active and U.S. customary and SI units are defined in the UoM group. The conversion group carries an U.S. customary UoM, UGL, as base conversion volume UoM. 10,000 m³ (M3) are converted to 10,000,002.374 L, which is formally correct: The ASTM Table 1 conversion factor (2008) from cubic meter to gallon is 264.1721, the ASTM Table 1 (2008) conversion factor from gallon to Liter is 3.785412, thus the product of these two factors is 1,000.000 237 405 2. Such conversions would theoretically require only one ASTM Table 1 conversion.

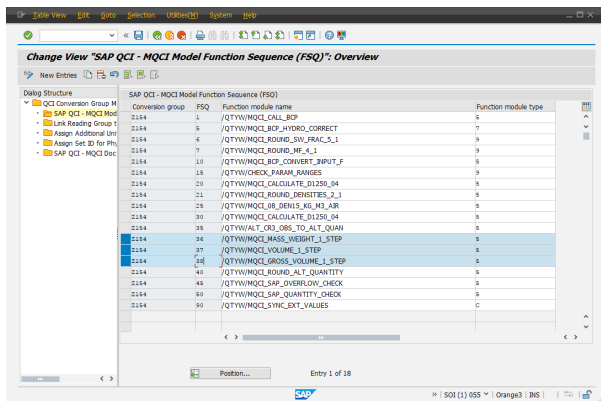
Cause

N/A

Solution

The MQCI base skipping concept is extended for all UoM conversions within the same dimension, i.e. (gross) volume to (gross) volume, (gross) mass to (gross) mass and (gross) weight to (gross) weight. To do this, a new function group /QTYW/MQCI_MODEL_EXT containing three new MQCI functions is delivered with this note, which convert UoM of the same dimension in one step – the 1 step UoM conversion case, without intermediate conversion to the base conversion UoM. These functions may be inserted into the MQCI calculation sequence after the main model calculation function has happened:

- /QTYW/MQCI_MASS_WEIGHT_1_STEP
- /QTYW/MQCI_VOLUME_1_STEP
- /QTYW/MQCI_GROSS_VOLUME_1_STEP

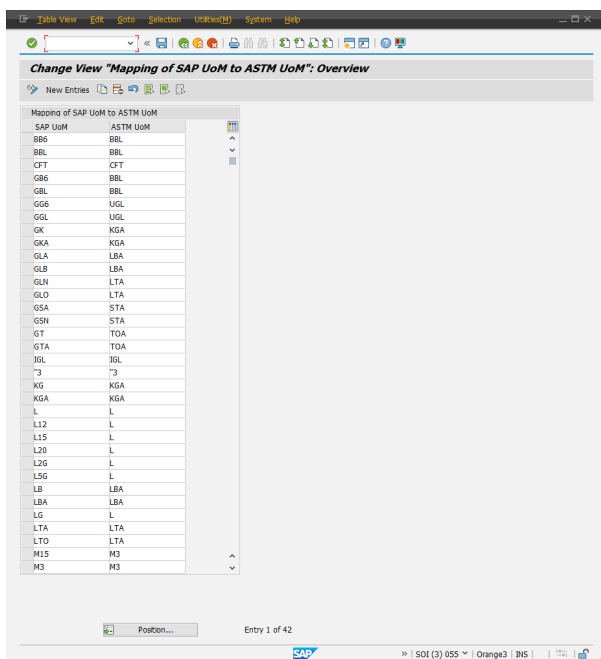


Other complex quantity conversions (e.g. from gross mass to net volume, gross volume to net weight, gross volume to net volume and vice versa) require the standard 2 step UoM conversion case.

This note also introduces a new check in the skipping function /QTYW/CONVERT_SKIP_BASE_ASTM1 such that only UoM combinations of the same dimension defined in the ASTM Table 1 mapping table can be selected for the 0 step UoM conversion skipping. (It is possible to map e.g. mass UoM to the corresponding weight UoM in this table, to avoid having to maintain additional entries in ASTM Table 1, which could trigger a base skipping for a conversion from e.g. mass UoM TO to weight UoM TOA).

Within the QuantityWare BCP BC set, the ASTM Table 1 conversion factors are delivered. For consultants who require an extended set up of ASTM Table 1 including mapping of gross mass, net mass, gross weight and gross volume UoM to the net weight and net volume ASTM Table 1 conversion factors, a comprehensive configuration example (w/o length UoM) is provided in the following screen shots:

ASTM Table 1 Mapping:



Change View "Mapping of SAP UoM to ASTM UoM": Overview

Mapping of SAP UoM to ASTM UoM

SAP UoM	ASTM UoM
MCS	M3
MGS	M3
STA	STA
STO	STA
TD	TOA
TOA	TOA
UGS	UGL
UGL	UGL

Position... Entry 35 of 42

ASTM 1 Table Conversion Factors:

Change View "Maintain ASTM Table 1 Intraconversion Factors": Overview

Maintain ASTM Table 1 Intraconversion Factors

Unit from:	Unit to:	ASTM Table 1 factor 1980 version	ASTM Table 1 factor 2008 version	ASTM Table 1 customer specific
BBL	BBL	1.000000000000	1.000000000000	0.000000000000
BBL	CFI	5.614850000000	5.614850000000	0.000000000000
BBL	IGL	34.372200000000	0.000000000000	0.000000000000
BBL	73	9702.0000000000	9702.0000000000	0.000000000000
BBL	L	169.987000000000	169.987000000000	0.000000000000
BBL	M3	0.185987000000	0.185987000000	0.000000000000
BBL	UGL	42.000000000000	42.000000000000	0.000000000000
CFI	BBL	0.178100000000	0.178100000000	0.000000000000
CFI	CFI	1.000000000000	1.000000000000	0.000000000000
CFI	IGL	6.228030000000	0.000000000000	0.000000000000
CFI	L	28.314900000000	28.314850000000	0.000000000000
CFI	M3	0.028314890000	0.028314880000	0.000000000000
CFI	UGL	7.480820000000	7.480819000000	0.000000000000
IGL	BBL	0.021594100000	0.000000000000	0.000000000000
IGL	CFI	0.149544000000	0.000000000000	0.000000000000
IGL	IGL	1.000000000000	1.000000000000	0.000000000000
IGL	73	277.420000000000	0.000000000000	0.000000000000
IGL	L	4.544090000000	0.000000000000	0.000000000000
IGL	M3	0.004844990000	0.000000000000	0.000000000000
IGL	UGL	1.209500000000	0.000000000000	0.000000000000
73	IGL	0.003464450000	0.000000000000	0.000000000000
73	73	1.000000000000	1.000000000000	0.000000000000
73	L	0.014397100000	0.014397040000	0.000000000000
73	UGL	0.004250000000	0.004250000000	0.000000000000
KGA	LBA	2.234620000000	2.234620000000	0.000000000000
KGA	LTA	0.009842060000	0.009842060000	0.000000000000
KGA	STA	0.001102310000	0.001102310000	0.000000000000
KGA	TOA	0.001000000000	0.001000000000	0.000000000000
L	BBL	0.004098000000	0.004098000000	0.000000000000
L	CFI	0.035314700000	0.035314670000	0.000000000000
L	IGL	0.215969000000	0.000000000000	0.000000000000
L	73	61.023740000000	61.023740000000	0.000000000000
L	L	1.000000000000	1.000000000000	0.000000000000
L	M3	0.001000000000	0.001000000000	0.000000000000

Position... Entry 1 of 65

Change View "Maintain ASTM Table 1 Intraconversion Factors": Overview

Unit from:	Unit to:	ASTM Table 1 factor 1980 version	ASTM Table 1 factor 2008 version	ASTM Table 1 customer specific
M3	M3	0.001000000000	0.001000000000	0.000000000000
L	UGL	0.264172000000	0.264172100000	0.000000000000
LBA	KGA	0.463532000000	0.463532370000	0.000000000000
LBA	LTA	0.000446428571	0.000446428571	0.000000000000
LBA	STA	0.000800000000	0.000800000000	0.000000000000
LBA	TOA	0.000463523700	0.000463523700	0.000000000000
LTA	KGA	1016.0600000000	1016.0469080000	0.000000000000
LTA	LBA	2240.0000000000	2240.0000000000	0.000000000000
LTA	STA	1.120000000000	1.120000000000	0.000000000000
LTA	TOA	1.014094908000	1.014094908000	0.000000000000
M3	BBL	4.239120000000	4.239120000000	0.000000000000
M3	CFT	35.314700000000	35.314700000000	0.000000000000
M3	IGL	219.9690000000	0.000000000000	0.000000000000
M3	"3	41023.8000000000	41023.7400000000	0.000000000000
M3	L	1000.0000000000	1000.0000000000	0.000000000000
M3	M3	1.000000000000	1.000000000000	0.000000000000
M3	UGL	244.1720000000	244.1721000000	0.000000000000
STA	KGA	907.1847000000	907.1847000000	0.000000000000
STA	LBA	2000.0000000000	2000.0000000000	0.000000000000
STA	LTA	0.892857000000	0.892857100000	0.000000000000
STA	TOA	0.907124740000	0.907124740000	0.000000000000
TOA	KGA	1000.0000000000	1000.0000000000	0.000000000000
TOA	LBA	2204.4200000000	2204.4200000000	0.000000000000
TOA	LTA	0.984204600000	0.984204600000	0.000000000000
TOA	STA	1.102310000000	1.102310000000	0.000000000000
UGL	BBL	0.023030820000	0.023030820000	0.000000000000
UGL	CFT	0.133428100000	0.133428100000	0.000000000000
UGL	IGL	0.832474000000	0.000000000000	0.000000000000
UGL	"3	231.0000000000	231.0000000000	0.000000000000
UGL	L	3.788410000000	3.788410000000	0.000000000000
UGL	M3	0.003786410000	0.003786410000	0.000000000000
UGL	UGL	1.000000000000	1.000000000000	0.000000000000

Position... Entry 34 of 65

Transport Reference

SAP Release	Transport	File Name	Notes
ECC600	QOIK900242	NOTE-00055-600.SAR	
S/4 HANA	-	-	

Validity

SAP Release	From SP	To SP	In SP Shipment
ECC600	BCS 10B CSP03	BCS 10B CSP03	BCS 3.0
S/4 HANA	-	-	BCS 3.0