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**Memo CP-D/397**

**Date:** 21 May 2004  
**To:** Distribution  
**From:** O. Schwerer

**Subject:** Quantities and units for thick/thin target yields

**Reference:** Memos CP-C/344 and CP-E/040

- I appreciate the clean-up efforts of memo CP-C/344. Below I reproduce the tables of this memo, adding my comments and the appropriate dictionary modifications. This covers also the changes requested in memo CP-E/040. I agree with the proposals and corrections submitted in CP-E/040 with one minor exception (dimension code **PYT2**, see following page).
- However, one type of thick target quantities is not listed in CP-C/344 (those with **TT** in SF8). Tables with those quantities and related remarks are given at the end.
- As suggested in CP-C/344, many quantities which are in dictionary 36 but do not occur in the database will be made obsolete (they are however not deleted at this stage). Some of them are meaningful codes and could become "real" in the future, whenever "real" data of these types are compiled for the first time. Therefore, the "obsolete" flag does not always mean that a quantity is wrong or illegal, and later requests to remove the obsolete flag may be justified.

## Tables from CP-C/344 with comments by NDS (in *red bold italic*)

### Quantity Dictionary

These were found on database or recently proposed.

(CUM), TTY	TTY	Saturated target yield (assumed cumulative)
(M), TTY	TTY	Saturated target yld (uncert.if isom.trans.incl)
, TTY	TTY	Saturated thick/thin target yield
, TTY, ,DT	TTT	Production thick/thin target yield
, TTY, ,PHY	TTT	Physical thick/thin target yield
, TTY/DA	TDA	Saturated thick/thin target yield d/Da <i>So far used only with REL (entry M0036), no corresponding units exist in dict. 25</i>
, TTY/DE, ,DT	TTTE	Production thick/thin target yield d/dE
, TTY/MLT	PYT	Saturated thick/thin target yield multipl.
, TTY/MLT/DA	PYTA	Saturated thick/thin target multiplicity d/dA
, TTY/MLT/DA,G	PYTA	Saturated thick/thin multiplicity d/dA(gammas)
, TTY/MLT/DA/DE	TD2	Saturated thick/thin target multiplic. d2/dA/dE <i>Unit dimension code will be changed to PYT2 (because it's the double-differential form of PYT)</i>
, TTY/PY	PYT	Saturated thick/thin target product yield
, TTY/PY/DA	PYTA	Saturated thick/thin target product yield d/dA
, TTY/PY/DA/DE	TD2	Saturated thick/thin targ.prod.yield d2/dA/dE <i>Unit dimension code will be changed to PYT2</i>
CUM, TTY	TTY	Cumulative saturated thick/thin target yield
CUM, TTY, ,DT	TTT	Cumulative production thick/thin target yield
IND, TTY ?	TTY	Independent saturated thick/thin target yield <i>Will be added to dict. 36</i>
IND, TTY, ,DT	TTT	Independent production thick/thin-target yield
IND/M+, TTY	TTY	Indep. saturated target yield,incl.isom.trans.
IND/M+, TTY, ,DT	TTT	Indep. production target yield incl.isom.trans.
M+, TTY	TTY	Saturated target yield, incl. via isom.transit.
M+, TTY, ,DT	TTT	Production target yield incl. via isom.transit.
PAR, TTY	TTY	Partial saturated target yield
PAR, TTY/MLT/DA	PYTA	Partial saturated target multiplicity d/dA
PAR, TTY/MLT/DA,G	PYTA	Partial saturated target multipl. d/dA(gammas)

This found only for C0108 and C0118; both corrected to PAR, TTY/MLT/DA (both given as REL); make quantity obsolete.

*Found also in A0388 with (P,X)0-G-0 and obsolete units G/PT/SR. REACTION should be changed to PAR,PY/DA, ,TT and units to PRD/INC/SR.*

PAR, TTY/DA	TDP	Partial saturated target yield d/dA <i>Will be made obsolete</i>
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This found only for A0527 and C0838; both should be corrected to , TTY/PY/DA/DE; make quantity obsolete.

*A0527 is a different case, giving (N,X)0-NN-1 in obsolete units N/PT/MEVSR. REACTION should be changed to PY/DA/DE, ,TT and units to P/IN/MEVSR.*

, TTY/DA/DE	*1/AE	Saturated thick/thin target yield d/dA/De <i>Will be made obsolete</i>
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\* If not deleted, correct unit code.

This found on entry O0530; should be coded as IND, PY, , TT, or more correctly giving authors original data in KBQ/MUAHR: IND, TTY, , DT

IND, PY, , DT	YLD	Independent product yield per unit time <i>Will be made obsolete</i>
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These were not found on library; may be removed if not needed.

*All these codes will be made obsolete:*

(CUM), TTY, , DT	TTT	Production target yield (assumed cumulative) <i>(Used in superseded subentry B0084008)</i>
, TTY/DA, , DT	TTDA	Production thick/thin target yield d/dA
, TTY/DE	1/E*	Saturated thick/thin target yield d/dE
, TTY/RAT	NO	Saturated thick/thin target yield ratio
CUM, TTY/RAT	NO	Cumul. saturated thick/thin target yield ratio
CUM/(M), TTY	TTY	Cum.satur.target yield (uncert.isom.trans.incl)
CUM/M-, TTY	TTY	Cumul.saturated target yield,exclud.isom.trans
EM, TTY/DA/DE	1/AE*	Double-diff.thick/thin target yld for emission
IND, TTY/RAT	NO	Independent saturated target yield ratio
M-, TTY	TTY	Saturated target yield, excl. isomeric transit.
PAR, TTY, G	TTY	Partial saturated thick/thin target gamma yield
SEQ, TTY	TTY	Saturated target yield for specif.reaction seq.

\* If not deleted, correct unit codes.

These were not found on library; may be removed if not needed.

Not correct in any case; SF6 should be ,TTY/PY; units should be PYT.

*Both these codes will be made obsolete:*

, PY, , DT	YLD	Product yield per unit time <i>(Made obsolete in last dictionary transmission) Used in entries B0167 and B0175, either with REL or with units MUCI/MUAHR. REACTION should be changed to ,TTY, ,DT</i>
CUM, PY, , DT	YLD	Cumulative product yield per unit time <i>Used in B0175.002 with units MUCI/MUAHR. REACTION should be changed to CUM, TTY, ,DT</i>

## Units Dictionary

CI/AHR/MEV	Curie/Ampere-hour/MeV <i>In dict.36 there is no quantity yet with this unit-dimension. See proposed new quantity ,TTY, ,TM in memo CP-D/396</i>	TTTE
DPS/MUAHR	decays per sec/micro-Ampere-hour	TTT
GBQ/COUL	Giga-Becquerel/Coulomb	TTT
GBQ/MUA	Giga-Becquerel/micro-Ampere	TTY
KBQ/MUAHR	Kilo-Becquerel/micro-Ampere-hour	TTT
MBQ/MUA	Mega-Becquerel/micro-Ampere	TTY
MBQ/MUAHR	Mega-Becquerel/micro-Ampere-hour	TTT
MCI/MUA	milli-Curie/micro-Ampere	TTY
MCI/MUAHR	milli-Curie/micro-Ampere-hour	TTT
MUCI/HRMEV	micro-Curie/micro-Ampere-hour/MeV <i>Not introduced, same as CI/AHR/MEV</i>	TTTE

	<i>(see CP-D/388)</i>	
MUCI/MUA	micro-Curie/micro-Ampere	TTY
MUCI/MUAHR	micro-Curie/micro-Ampere-hour	TTT
P/MEVMUCSR	particles/(MeV muC sr) <i>Dimension code changed to PYT2</i>	(TD2) <i>PYT2</i>
PART/MUAHR	Particles/micro-Ampere-hour <i>Obsolete, replaced by PRT/MUAHR which has dimension PYT</i>	TTY
PRD/MUAHR	products/micro-Ampere-hour	PYT*
PRD/MUC/SR	products/micro-Coulomb/steradian	PYTA
PRD/MUCOUL	products/micro-Coulomb	PYT
PRT/MUAHR	particles/micro-Ampere-hour	PYT
PRT/MUC/SR	partcles/micro-Coulomb/steradian	PYTA
(PPRT/MUCOUL) <i>PRT/MUCOUL</i>	particles/micro-Coulomb	PYT

\* Unit code corrected.

### Thick target quantities not listed in CP-C/344

These are all quantities with SF8 = TT. These have the same units dimension as the corresponding quantities with blank SF8. Nevertheless it is important to include them in the list of thick target quantities (also in LEXFOR) for reference.

The following quantities are used in the database or in a PRELIM file or were proposed recently in a memo.

Quantity	Type	Dim.	Expansion
,DA,,TT	DA	DA	Diff.cross section d/dA for thick target
,DA/DE,,TT	DAE	DAE	Double-diff. cross section for thick target
,MLT,,TT	*	YLD	Multiplicity for thick target, no.part./inc.
,MLT,N,TT	*	YLD	Neutron multiplicity for a thick target
,MLT/DA,,TT	DA*	1/A	Particle multiplicity f.thick target d/dA
,MLT/DA,,TT/IPA	DA*	YLD	Diff.part.multip.f.thick target,int.ang.range
,MLT/DE,,TT	DE	<b>(YLD)</b>	Particle multiplicity f.thick target d/dE <i>Dim. to be corrected to 1/E</i>
,PY,,TT	PY	YLD	Prod.yield for thick target, no.of nucl./inc.
,PY/DA,,TT	<b>(PY+)</b>	1/A	Diff.product yield d/dA for thick target <i>React.type to be corrected to PYA</i>
,PY/DA,,TT/IPA	PYA	YLD	Diff.product yield d/dA for thick target, int.ang.range
,PY/DA/DE,,TT	PY2	1/AE	Double-diff.product yield for thick target
,SIG,,TT	CS	B	Cross section for thick target
,SPC,,TT	SP	YLD	Gamma spectrum for thick target
IND,PY,,TT	PY	YLD	Indep. product yield for a thick target
PAR,DA,,TT	DAP	DA	Thick-target angular distr., partial reaction

PAR,PY,,TT	PYP	YLD	Partial product yield for thick target
PAR,PY,G,TT	PYP	YLD	Product yield for thick target for a given gamma
PAR,PY/DA,,TT	PYA	1/A	Partial diff.product yield d/dA for thick target
PAR,DA,G,TT	DAP	DA	Diff.partial gamma emission cross section for thick target
PAR,SIG,G,TT	CSP	B	Partial gamma emission cross section for thick target

The following quantity's deletion was requested in CP-C/340. Since it is used (correctly, I believe) in entries E1756 and E1759, it will be kept.

,MLT/DA/DE,,TT	<b>(D2*)</b>	1/AE	Particle multiplicity f.thick target d2/dA/dE <i>React.type to be corrected to YAE</i>
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The following quantities were introduced in 2003 or before but were so far not used.

CUM,PY,,TT	PY	YLD	Cumulative product yield for thick target
CUM/M-,PY,,TT	PY	YLD	Cumul.prod.yield f.thick targ. excl. isom. trns.
M+,PY,,TT	PY	YLD	Prod.yield for thick target,incl.via isom.trans

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