OICA response to China‘s low energy content requirement proposal

Present Chinese proposal

Now low energy requirement is optional choice of post crash in5.2.2.2.

Suggestion:

- **Low energy should be necessary requirement in-use for indirect contact protection asisolation resistance requirement.**

- **If the energy is higher than 0.2J above 60VDC /30VAC, it`s a danger to the person when there`s an onepoint failure.**

Industry Proposal

General remark:

„in use“ is too general, we should consider a) „active driving mode“ (or „driving“) and b) „charging“ separately.

For case a):

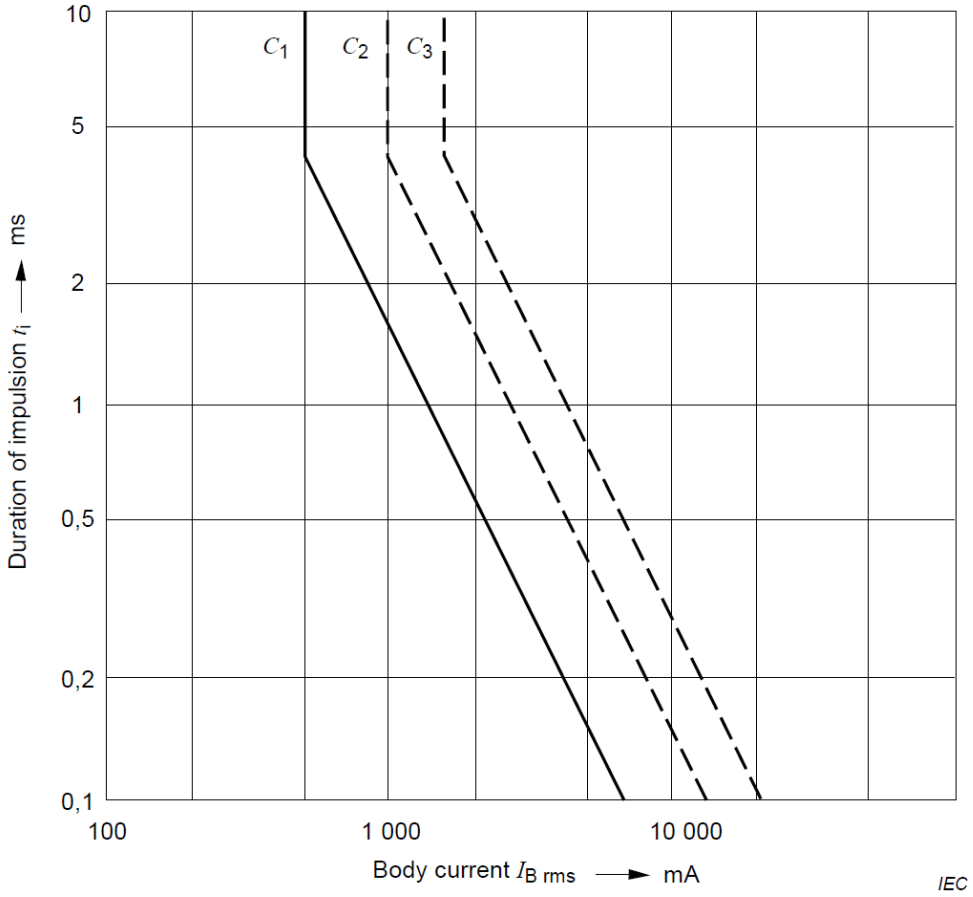
Do not use 0.2 J from ISO 6469-3, but use values from SAE 1772-2017. SAE values are based on IEC 60479/2 and are scientifically based. See next slides.

For case b):

Further investigations are necessary (see expected presentation from U.S.) to define a value.

Rationale for IEC 60479-2

IEC 60479-2 („Biegelmeier curves“)



The curves indicate the probability of fibrillation risk for current flowing through the body from the left hand to both feet. For other current paths, see 5.9 in IEC 60479-1.

Below C_1:	no fibrillation;
Above C_1 up to C_2:	low risk of fibrillation (up to 5% of probability);
Above C_2 up to C_3:	average risk of fibrillation (up to 50% of probability);
Above C_3:	high risk of fibrillation (more than 50% probability).

Figure 20 – Threshold of ventricular fibrillation

Correct derivation of maximum capacitance

SAE J1772-2017 (maximum capacitance for vehicle and charging column)

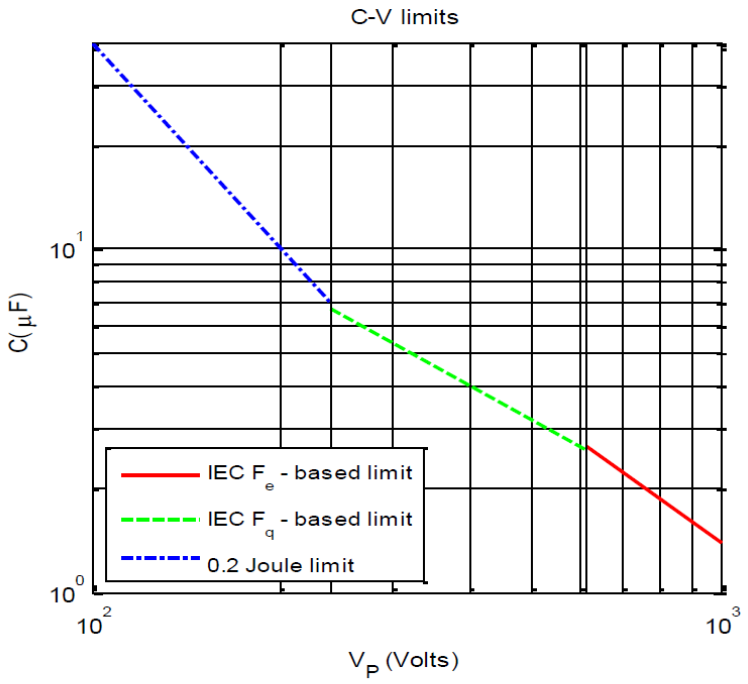


Figure 14 - Combined Y capacitance limit

APPENDIX J – DC Y CAPACITANCE REQUIREMENT DERIVATION - INFORMATIVE

J.1 INTRODUCTION

This appendix describes the derivation of Y capacitance limits, as a function of voltage, from the limits given in IEC 60479-2. The IEC standard references quantities called specific fibrillating energy and specific fibrillating charge:

derived from C1 limit (IEC 60479-2):

$$C_{t,\max} = \begin{cases} \dfrac{0.4}{V_{\max}^2} & \text{for} \quad V_{\max} < 240 \\ \dfrac{0.0016}{V_{\max}} & \text{for} \quad 240 \le V_{\max} < 612 \\ 0.01387 \cdot V_{\max}^{-4/3} & \text{for} \quad 612 \le V_{\max} \end{cases}$$

V_{max}	$C_{t,max}$
500 V	3,2 µF
1000 V	1,387 µF

*(Ct,max = sum of capacitances of both HV potentials, contains **1 µF** for charging column; see also IEC 61851-23:2014)*

Please note: detailled derivation of formulae and figure can be found in SAE J 1772-2017, Appendix J.