

## Re: How to calculate current to melt wire?

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*Source:* <http://sci.tech-archive.net/Archive/sci.electronics.design/2008-05/msg03317.html>

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- *From:* "John KD5YI" <[groups1\\_dot\\_jocjo@xxxxxxxx](mailto:groups1_dot_jocjo@xxxxxxxx)>
  - *Date:* Sat, 24 May 2008 17:34:21 GMT
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"Jim Thompson" <[To-Email-Use-The-Envelope-Icon@xxxxxxxxxxxxxxxx](mailto:To-Email-Use-The-Envelope-Icon@xxxxxxxxxxxxxxxx)> wrote in message [news:2ibg3411qubtqlp26ocongdlenuk6n4lo@xxxxxxxx](mailto:news:2ibg3411qubtqlp26ocongdlenuk6n4lo@xxxxxxxx)

On Sat, 24 May 2008 13:46:52 GMT, "John KD5YI" <[groups1\\_dot\\_jocjo@xxxxxxxx](mailto:groups1_dot_jocjo@xxxxxxxx)> wrote:

"Paul Hovnanian P.E." <[paul@xxxxxxxxxxxxxxxx](mailto:paul@xxxxxxxxxxxxxxxx)> wrote in message [news:483764C3.28C3B102@xxxxxxxxxxxxxxxx](mailto:news:483764C3.28C3B102@xxxxxxxxxxxxxxxx)

John Larkin wrote:

On Thu, 22 May 2008 20:52:36 -0500,  
"Mook Johnson" <[mook@xxxxxxxx](mailto:mook@xxxxxxxx)>  
wrote:

>  
>"Michael" <[nleahcim@xxxxxxxx](mailto:nleahcim@xxxxxxxx)> wrote  
in message  
>[news:12285dfc-2e08-4c96-ac0f-fe0b3c212aa8@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:12285dfc-2e08-4c96-ac0f-fe0b3c212aa8@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)  
>> Hi there - I found an interesting failure  
on a PCB today. A large >> part  
>> of one of the leads of a TO-220 was  
simply gone. That pin was >> carrying  
>> a fairly high voltage and got shorted to  
ground.  
>>  
>> Does anybody know how much current it  
would take to blow a TO-220 >> pin  
>> like this? Additionally, is there a rough  
calculation for how to >> find  
>> out how much current would actually  
melt a wire in open air?  
>>  
>> Thanks!  
>>  
>> -Michael

Re: How to calculate current to melt wire?

- >
- >Its not just the DC current but the  
instintaneous current that can >fuse
- >a
- >wirelink. A surprisingly small high voltage  
capacitance discharged
- >across a
- >link of wire can blow it as well.
- >

[http://www.teledynersi.com/products/0products\\_2fs\\_page51.asp](http://www.teledynersi.com/products/0products_2fs_page51.asp)

This uses a 1 uF cap to fire "non-primary"  
(ie, damned hard to fire)  
explosives like

[http://www.teledynersi.com/products/0products\\_1ebw\\_page27.asp](http://www.teledynersi.com/products/0products_1ebw_page27.asp)

This is a "bridge wire" detonator, just an  
exploding wire buried in  
HE.

One of my customers is planning to use  
these gadgets to launch 16  
starlings, in 4 groups of 4, at a couple  
hundred millisecond  
intervals, into a running jet engine.

John

Reminds me of the story about the 'chicken cannon' used to  
test  
airframes. Bird carcasses were loaded into this pneumatic  
cannon and  
fired at cockpit windows, wing leading edges, etc. to certify  
them for  
bird strike survival.

A British airframe manufacturer was provided detailed plans  
by a US  
company to build and operate said cannon to test their  
assemblies. Upon  
firing their first chicken into a known sound cockpit window,  
they were  
horrified when the window was shattered and surrounding  
fuselage bent.  
They sent detailed test procedures, results, photographs, etc.  
back to  
the American company, seeking advice.

Re: How to calculate current to melt wire?

The Americans responded with a one sentence suggestion:  
"Thaw the  
chicken."

--  
Paul Hovnanian <mailto:Paul@xxxxxxxxxxxxx>

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I have a truly marvellous sig which this margin is too narrow  
to  
contain.

Mostly urban legend, according to:  
<http://www.snopes.com/science/cannon.asp>

Cheers,  
John

Except it's not. I contracted (\*) at Goodyear Aerospace...

[http://en.wikipedia.org/wiki/Goodyear\\_Aerospace](http://en.wikipedia.org/wiki/Goodyear_Aerospace)

in the early 70's.

At that time they fired LIVE chickens at aircraft windshields.

Of course ASPCA got all hot and bothered when they heard about it. So  
we then had to use dressed processed (dead) chickens. These WERE  
stored frozen, and thawed just prior to loading into the "cannon".

It's conceivable that some failed to thaw before firing ;-)

IIRC, I believe the windshield material was LEXAN. I put some of it  
into the gaslight at my old acreage, because the juvenile heathens  
kept breaking out the regular glass.

(\*) Hybrid circuits for side-looking radar.

...Jim Thompson

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James E.Thompson, P.E.	mens
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America: Land of the Free, Because of the Brave

Re: How to calculate current to melt wire?

Yes, Jim, I know birds are actually fired into aircraft windshields and engines. The part about the British being so stupid as to not thaw the bird first is the legend.

John

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