Zimbra xiaochao@jlab.org

Quote no. W14-330A RE: Scintillator detector inquiries for the JLab SoLID project

From : Stephanie Wiele <swiele@eljentechnology.com> Wed, Oct 15, 2014 12:52 PM

Subject : Quote no. W14-330A RE: Scintillator detector inquiries for the JLab SoLID project

To : 'Xiaochao Zheng' <xiaochao@jlab.org>

Cc : cmaxwell@eljentechnology.com, churlbut@eljentechnology.com

Hello Xiaochao,

Here is the quotation. I have worked up pricing for both 10mm and 20mm thicknesses. I have attached the concept drawing for the light guide. Let me know if there are any changes you would like to make, and then I can work up pricing for the light guides as well.

1. EJ-200 Plastic Scintillator Trapezoid
Size: 10mm thick x 83mm wide to 140mm wide x 570mm long
Edges diamond-milled
3 ea. $356 each
60 ea. $180 each

2. EJ-200 Plastic Scintillator Trapezoid
Size: 20mm thick x 83mm wide to 140mm wide x 570mm long
Edges diamond-milled
3 ea. $403 each
60 ea. $212 each

3. EJ-200 Plastic Scintillator
Size: 50mm x 50mm x 100mm
Edges diamond-milled
3 ea. $132 each

Delivery:
Item 1-2: 3-4 weeks ARO (3 ea.), 5-6 weeks ARO (60 ea.)
Item 3: 2 weeks ARO
*Lead times are based on our current workloads. A firm delivery date will be provided at the time of the order.

Payment Terms: NET 30 days with approved credit or Credit Card

Ex works: Sweetwater TX

Validity of Quote: 90 days

Kind regards,

Stephanie Wiele
Sales

Eljen Technology
1300 W. Broadway
Sweetwater TX 79556
Ph: 325-235-4276
Toll Free: 888-800-8771
Fax: 325-235-0701
Website: www.eljentechnology.com

-----Original Message-----
From: Xiaochao Zheng [mailto:xiaochao@jlab.org]
Sent: Thursday, October 09, 2014 3:18 PM
To: Stephanie Wiele
Subject: Re: Scintillator detector inquiries for the JLab SoLID project

Dear Stephanie:

Thank you for your email. I asked people at JLab working on the project and I think I did not ask the correct question. It is true that all scintillators are sensitive to X- and gamma-rays. The photon rejection performance will come out from our simulation.

Given that all three types you sent me have similar rise/decay time, light output, and density, I think any of them can be used. We do prefer a type with the longest decay length.

So can we proceed with a quote for the detector and a design for the light guide?

thanks,

Xiaochao

----- Original Message -----
From: "Stephanie Wiele" <swiele@eljentechnology.com>
To: "Xiaochao Zheng" <xiaochao@jlab.org>
Sent: Thursday, October 9, 2014 2:58:36 PM
Subject: RE: Scintillator detector inquiries for the JLab SoLID project

Hello Xiaochao,

Thank you for contacting us as you develop this project. However, as far as I am aware, all of our scintillator materials are sensitive to gamma rays and x-rays. From our experience, in order to minimize the sensitivity to

photons, the scintillator needs to be at most a few millimeters thick (see attached graph). I will see if we have any other solutions we could offer, but I don't think we have a material for this application that will be virtually insensitive to gamma or x-rays. I have attached data sheets for some of our scintillators for your reference.

Kind regards,
Stephanie Wiele
Sales
Eljen Technology
1300 W. Broadway
Sweetwater TX 79556
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Toll Free: 888-800-8771
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Website: www.eljentechnology.com

-----Original Message-----
From: Xiaochao Zheng [mailto:xiaochao@jlab.org]
Sent: Tuesday, October 07, 2014 12:23 PM
To: swiele@eljentechnology.com
Subject: Scintillator detector inquiries for the JLab SoLID project

Dear Eljen Technology:

I am from University of Virginia and I do research at Jefferson Lab in Newport News, Virginia. One of the upcoming project is called the "SOLID" project, or "Solenoid Large Intensity Device", and I am designing its scintillator pad detector (SPD). Below please find three questions, just to start the discussion on a few things:

1) There are two SPDs needed for SoLID, named large-angle (LASPD) and forward-angle (FASPD) respectively. To start the discussion, I have attached a sketch only for the LASPD design. Each LASPD pad will be a trapezoid, and a total of 60 pieces will be used to form a ring-shaped detector. The dimension of each segment is shown in the sketch. The thickness is yet to be determined, but will likely be between 1cm and 2cm.

We do hope to achieve a good timing resolution (<100ps) and a small rise time (<2ns). The other requirement is that the SPD should provide good PID between charged particles and photons. Therefore, the material should give no signal to photons (of any energy, from X- to gamma-rays), but large signals for charged particles such as electrons, muons, and pion.

Can you recommend a type of material and provide a cost estimate? We will need 60 pieces eventually, but we might order 3 pieces for prototype

testing.

2) Would it be possible to design and produce light guide for each segment? The light guide should be attached to the outer edge as shown in the sketch, and match to a PMT. The diameter of the PMT will likely be one inch, but may be subject to change depending on the light loss of the light guide. (In other words, if light guides for 1-in PMTs cause too much loss we can try to use larger PMTs and lower-loss light guides).

3) We are setting up a timing test stand for the SPD, which we will use to test the PMT performance as well. Thus, we need 3 pieces of fast and high-yield scintillator bars to setup such test stand. For these test bars, I think a size of 5x5x10 (cm) would be sufficient. Can you provide a quote for 3 of such test bars? The material should be the same as for 1).

Thank you and I am looking forward to your reply.

Xiaochao

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