



BoE's

(Basis Of Estimates)

June 5, 2007

Harry Ferguson III



BoE Usage

- The BoE form is used uniformly across the NOvA project

Usage Break down

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• Total BoE for Nova project	328



BoE's in NOvA document database



NOvA (E929)

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Document List by Topic

These documents on BOEs for WBS X.5 PVC Modules (including of BOEs) are available:

NOVA doc #	Title	Author(s)	Topic(s)	Last Updated
2215-02	BoE WBS 2.5.1.3.3 Detector Module	Tom Chason, Monette	BoE, WBS X.5	01 Jun 2007
2215-02	BoE WBS 2.5.1.4 Extrusion Machine	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2218-02	BoE WBS 2.5.1.4 Facet Labor	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2212-02	BoE for WBS 2.5.1.1.2 "End Plate And Seal Production"	Thomas Chase	BoE, WBS X.5	01 Jun 2007
2214-02	BoE WBS 2.5.1.3.3 PVC Seals	Tom Chason, Monette	BoE, WBS X.5	01 Jun 2007
2213-02	BoE for WBS 2.5.1.2 "Technical connection"	Thomas Chase et al	BoE, WBS X.5	01 Jun 2007
2211-02	BoE for WBS 2.5.1.1 "Water Main/Off Production" an accessories for Item X2	Thomas Chase	BoE, WBS X.5	01 Jun 2007
2214-02	BoE WBS 2.5.1.3.3 Fiber Check-out Device	Tom Chason, Monette	BoE, WBS X.5	01 Jun 2007
2207-02	BoE WBS Module Face Flange Covers	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2204-02	BoE WBS 2.5.1.3.1.7.3 Barrel Facet Glass Machine	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2205-02	BoE WBS 2.5.1.3.1.9 Facet Glass Machine	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2204-02	BoE WBS 2.5.1.4 Facet Adhesives	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2203-02	BoE WBS 2.5.1.3.1.7.3 Barrel Facet Glass Machine	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2202-02	BoE WBS 2.5.1.1.1.7 Facet Glass Machine	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2201-02	BoE WBS 2.5.1.4 Facet Adhesives	Alisa Smith	BoE, WBS X.5	01 Jun 2007
2200-02	BoE WBS 2.5.1.3.2.10 Facet Extrusion Labor Entry	Alisa Smith	BoE, WBS X.5	01 Jun 2007

NOvA Project Office

BASIS OF ESTIMATE FORM (BoE)

Document Number: 2212

Date of Estimate: 6/31/07

Prepared by: T. Chase

UID Number: WBS Section: 2.5.1.2

Task Name: End Plate And Seal Production

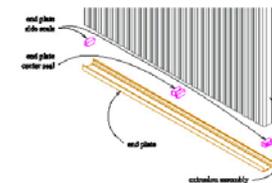
Cost Type:	Costing Method:	Prior purchase or experience	Catalog Price
<input type="checkbox"/> M&S <input type="checkbox"/> Labor	<input checked="" type="checkbox"/> Engineering Estimate	Source:	Source:
		<input type="checkbox"/> Vendor Quote (attached)	<input type="checkbox"/> Other Description:

Attach Relevant Documents (including but not limited to): RFP, Responses to RFP, Technical Evaluation of RFP, Vendor Quotes, Technical Specifications, drawing numbers

Task Duration: (calendar weeks, 83% schedulable) - see table below

Task M&S Cost (FY07): 72400 mold cost + 21.80/mold	Task Labor (resource type & work hours or % for duration of task, 83% efficiency assumed):
See cost table below	Task Labor Contingency (%):
Task M&S Contingency (%): 25	

The end plate architecture is illustrated below. Components of the end plate assembly include: end plate, end plate center seal, end plate side seals, and fiber retaining rings. The fiber retaining rings control the bend radius of the bottom loop in the optic fibers and hold them at the bottom of each extrusion cell. They are not shown in the figure.



The end plate side seals and end plate center seal are attached directly to the extrusion assembly. They seal against the end plate while also absorbing a possible 46 mm variation in the width of the extrusion assembly. They also create alignment references for attaching the end plate. The end plate includes a fluid channel to enable liquid scintillator to flow from cell to cell.

The cost of the parts in the end plate assembly is summarized in the Table below. All parts except the end plate are injection molded from rigid PVC. The end plate part is extruded, which reduces its cost. The piece part costs are expenses of the mold costs. Costs for the end plate end seal are based on lot quantities of 10,000. The cost of the fiber retaining rings is based on lot quantities of 550,000, as 32 rings are utilized in each module. Engineering drawings of all parts are attached. Vendor quotes for

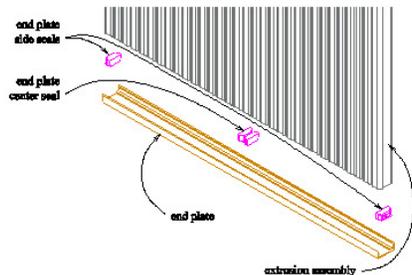


BoE Form Information

 NOVA Project Office BASIS of ESTIMATE FORM (BoE)		Document Number: 2212	
		Date of Estimate: 5/31/07	
		Prepared by: T. Chase	
UID Number:	WBS Section: 2.5.1.2		
Task Name: End Plate And Seal Production			
Cost Type:	Costing Method:	Prior purchase or experience Source:	Catalog Price Source:
<input type="checkbox"/> M&S <input type="checkbox"/> Labor	<input checked="" type="checkbox"/> Engineering Estimate <input checked="" type="checkbox"/> Vendor Quote (attached)	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other Description: _____			
Attach Relevant Documents (including but not limited to): RFP, Responses to RFP, Technical Evaluation of RFP, Vendor Quotes, Technical Specifications, drawing numbers			
Task Duration: (calendar weeks, 85% achievable): see table below			
Task M&S Cost (FY07\$): 72400 mold cost + 21.80/module See cost table below Task M&S Contingency (%): 25		Task Labor (resource type & work hours or % for duration of task, 85% efficiency assumed): Task Labor Contingency (%):	

- Document number
- Date of Estimate
- Prepared by
- WBS Section
- Task Name
- Cost Type
- Costing Method
- M&S Cost (unburdened)
- M&S Contingency%
- Task Labor (hrs)
- Task Labor Contingency%

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The cost of the parts in the end plate assembly is summarized in the Table below. All parts except the end plate are injection molded from rigid PVC. The end plate part is extruded, which reduces its cost. The piece part costs are exclusive of the mold costs. Costs for the end plate and seals are based on lot quantities of 10,000. The cost of the fiber retaining ring is based on lot quantities of 530,000, as 32 rings are utilized in each module. Engineering drawings of all parts are attached. Vendor quotes for



Other Files in BoE Document



AMERICAN EXTRUDED PLASTICS, INC.

PO Box 7422 • Greensboro, NC 27417-0422 • 938 Reynolds Plaza • Greensboro, NC 27403
Tel: 336 274-1131 • 800 452-5533 • Fax: 336 274-2448 • e-mail: mail@explastics.com • www.explastics.com



NOvA (E929)

NOvA Off-Axis V_e Appearance Experiment

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[Fermilab at Work](#)

Dr. Thomas Chase
University of Minnesota
111 Church St SE Mechanical Engineering Department
Minneapolis, MN 55455
Phone: 612-625-0308 Fax: 612-625-6069

November 2, 2006

Dear Dr. Chase:

Thank you for your request for a quotation. Pricing includes 2 drilled holes and sawed to length. Sample charge includes 500 pieces extruded and drilled. Tooling will be production quality so as to handle sampling and production needs. We are pleased to quote the following:

Description: Nova Bot
Length: 51.32" Lc
Tolerances: To Be De
Quality Notes: Smooth E
Material: Rigid Poly
Color: White

Quantity
5,000 Pieces
10,000 Pieces
20,000 Pieces

Sample Parts:
One-Time Engineering E
Delivery:

NOVA Document 2212-v2

BoE for WBS 2.5.1.2: "End Plate And Seal Production"

Document #: NOVA-doc-2212-v2
Document type: [BOE](#)
Submitted by: [Ken Heller](#)
Updated by: [Ken Heller](#)
Document Created: 01 Jun 2007, 09:31
Contents Revised: 01 Jun 2007, 23:10
DB Info Revised: 01 Jun 2007, 23:10

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Abstract:
Parts for end plate and seals

Files in Document:

- [BOE WBS 2.5.1.2 End Plate and End Seal Production.doc](#) (251.0 kB)

Other Files:

- [Engineering drawing of NOvA end plate](#) (nova_bot_plate_extrude.pdf, 40.8 kB)
- [Engineering drawing of end plate center seal](#) (nova_end_plate_ctr_seal.pdf, 59.2 kB)
- [Engineering drawing of end plate side seal](#) (nova_end_plate_side_seal.pdf, 59.2 kB)
- [Engineering drawing of fiber retaining ring](#) (retainingring_circle.pdf, 67.8 kB)
- [Quote #1 for end plate fabrication](#) (endPlateQuote1_2Nov06.pdf, 21.7 kB)
- [Quote #1 for fiber retaining ring fabrication](#) (BbRetRingQuote1_23Apr07.pdf, 24.3 kB)
- [Quote #2 for end plate fabrication](#) (endPlateQuote2_30Apr07.pdf, 12.2 kB)
- [Quote #2 for fiber retaining ring fabrication](#) (BbRetRingQuote2_28Mar07.pdf, 17.8 kB)
- [Quote #3 for fiber retaining ring fabrication](#) (BbRetRingQuote3_17Apr07.pdf, 17.3 kB)

Get all files as [tar.gz](#) zip.

Topics:

- [BOEs for WBS X.5 PVC Modules](#)

Authors:

- [Thomas Chase](#)

Keywords:

[end plate](#)

Referenced by:

- NOVA-doc-2197: [Obsolete](#)

Associated with Events:

[Directors Review for CD2/3a](#) held from 04 Jun 2007 to 06 Jun 2007 in Fermilab

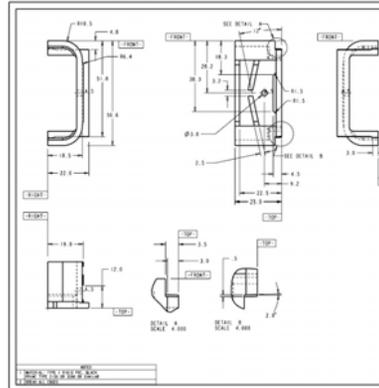
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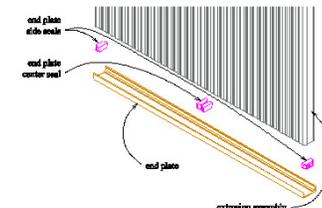
- [nova](#)
- [nova-techboard](#)

Other Versions:
[NOVA-doc-2212-v1](#)
01 Jun 2007



		NOVA Project Office		Document Number: 2212
		BASIS OF ESTIMATE FORM (BoE)		Date of Estimate: 5/31/07
				Prepared by: T. Chase
UID Number:	WBS Section:		2.5.1.2	
Task Name: End Plate And Seal Production				
Cost Type:	Costing Method:	Prior purchase or experience	Catalog Price	
___ M&S ___ Labor	<input checked="" type="checkbox"/> Engineering Estimate	Source:	Source:	
		<input checked="" type="checkbox"/> Vendor Quote (attached)		___ Other-Description:
Attach Relevant Documents (including but not limited to): RFP, Responses to RFP, Technical Evaluation of RFP, Vendor Quotes, Technical Specifications, drawing numbers				
Task Duration: (calendar weeks, 85% achievable) see table below				
Task M&S Cost (FY07\$): 72400 mold cost + 21.80/module		Task Labor (resource type & work hours or % for duration of task, 85% efficiency assumed):		
See cost table below		Task Labor Contingency (%):		
Task M&S Contingency (%): 25				

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NOvA-doc-# in OpenPlan Schedule

NOVA PROJECT		CD-2/3a Director's Review						
BoE Information		June 4-6, 2007						
(All Cost Fully Burdened FY07 \$)								
DOCCB#	Activity ID	Activity Description	Duration	BAC Material	BAC Labor	BAC Total	M&S Cons. (%)	Labor Cons. (%)
0	2	Construction Project	1715d	\$150,878,501	\$41,100,118	\$191,787,619	29%	38%
0	2.5	PVC Modules	1323d	\$6,381,871	\$8,382,208	\$12,763,679	29%	49%
0	2.5.1	End Seals	416d	\$1,951,280	\$92,658	\$2,003,918	25%	48%
2211	2.5.1.1	Fiber Manifold Production	376d	\$1,505,000	\$83,101	\$1,588,101	25%	48%
2212	2.5.1.2	End Plate and Seal Production	256d	\$448,200	\$19,557	\$465,817	24%	47%
2188	2.5.1.2.6	Procure edge stiffeners	60d	\$10,100	\$0	\$10,100	0%	0%
0	2.5.2	Optical Connector Production	150d	\$84,880	\$16,777	\$101,457	15%	47%
2213	2.5.2.6	Produce optical connectors	45d	\$84,880	\$0	\$84,880	15%	0%
0	2.5.3	Module Production	1071d	\$4,330,581	\$8,231,302	\$10,581,974	31%	49%
0	2.5.3.1	Factory Machines, Tooling, & Fixtures	180d	\$1,378,200	\$0	\$1,378,200	31%	0%
0	2.5.3.1.1	Factory 1 - FNAL	86d	\$278,400	\$0	\$278,400	29%	0%
2186	2.5.3.1.1.1	Fabricate and deliver extrusion filters	85d	\$48,400	\$0	\$48,400	40%	0%
2207	2.5.3.1.1.3	Procure floor cranes	40d	\$80,800	\$0	\$80,800	0%	0%
2202	2.5.3.1.1.5	Procure glue machines	65d	\$48,400	\$0	\$48,400	30%	0%
0	2.5.3.1.2	Factory 2 - UMNTC	103d	\$1,090,800	\$0	\$1,090,800	32%	0%
2189	2.5.3.1.2.1	Fabricate and deliver extrusion filter(s)	85d	\$80,800	\$0	\$80,800	40%	0%
2198	2.5.3.1.2.3	Fabricate and deliver pressure testing equipment	65d	\$90,900	\$0	\$90,900	40%	0%
2190	2.5.3.1.2.4	Procure material handling and storage equipment	65d	\$181,800	\$0	\$181,800	40%	0%
2206	2.5.3.1.2.5	Procure gluing machines	65d	\$242,400	\$0	\$242,400	15%	0%
2216	2.5.3.1.2.6	Fabricate fiber spooling machine	120d	\$181,800	\$0	\$181,800	25%	0%
2214	2.5.3.1.2.7	Fabricate and deliver fiber checking machine	20d	\$90,900	\$0	\$90,900	40%	0%
2207	2.5.3.1.2.8	Procure floor cranes	60d	\$121,200	\$0	\$121,200	40%	0%
2215	2.5.3.1.2.9	Fabricate fiber fusing machine	65d	\$80,800	\$0	\$80,800	30%	0%
0	2.5.3.3	Factory Setup	780d	\$1,710,404	\$290,720	\$2,010,124	36%	61%
0	2.5.3.3.1	Factory 1 - FNAL	186d	\$171,680	\$131,340	\$303,020	83%	74%
0	2.5.3.3.1.7	Infrastructure Setup	30d	\$148,480	\$90,877	\$248,357	84%	78%
2192	2.5.3.3.1.7.4	Install and setup extrusion filters	10d	\$0	\$5,100	\$5,100	0%	50%
2203	2.5.3.3.1.7.7	Install and setup gluing machines	5d	\$0	\$3,620	\$3,620	0%	50%
0	2.5.3.3.2	Factory 2 - UMNTC	780d	\$1,547,724	\$154,371	\$1,707,095	29%	59%
2193	2.5.3.3.2.2	Lease factory space	720d	\$1,191,800	\$5,463	\$1,197,263	30%	50%
0	2.5.3.3.2.7	Infrastructure Setup	70d	\$168,084	\$132,540	\$300,604	0%	50%
2196	2.5.3.3.2.7.3	Install and setup pressure testing equipment	10d	\$0	\$3,698	\$3,698	0%	50%
2206	2.5.3.3.2.7.6	Install and setup gluing machines	10d	\$0	\$3,310	\$3,310	0%	50%
2200	2.5.3.3.2.7.8	Install and setup extrusion filters	10d	\$0	\$7,404	\$7,404	0%	50%

Project: NOVA_PROJECT
 View: NOVA_SPROGHT DOCCB_N
 Filter: PARENT(ACT_ID,2) = '2.5' and USER_NUM09 > '0'
 Sort:
 Date: 03Jun07 02:17PM