

MALEIC ANHYDRIDE PLANT NO. 1

RECORD OF INSTALLATION

VOLUME II

ENGINEERING DEPARTMENT

CARBIDE AND CARBON CHEMICALS CORPORATION

SOUTH CHARLESTON, WEST VIRGINIA

1940

PLAINTIFF'S
EXHIBIT

76013.00

UCASB02077031

WV-17817

ELLIOTT COMPANY

Cincinnati, Ohio
February 20, 1939

Carbide & Carbon Chemicals Corporation,
South Charleston, West Virginia.

Attention: Mr. R. C. Hosterman

Re: 600 Kw. Electric Dowtherm Heater
Negotiation N-131-CI

Gentlemen:

We enclose specifications in triplicate for the 600 Kw. heater, which you are considering.

The price of this heater, in accordance with the specifications and outline Y-920044, will be \$4,925.00 f.o.b. factory, Jeannette, Pennsylvania, without control.

There are several features in these specifications which will be of interest. Among these -

The heater ribbon will be .025" thick. On the original heater the ribbon was .004" thick and for the replacement basket .02". This added thickness will result in exceptionally rugged construction.

The manufacturer of the insulating material for the ribbon support, as a result of further research, has recommended a different material for this service. The trade name of this insulation is Marinite. It is constructed from asbestos material and an inorganic binder, and will be guaranteed for temperatures to 900°F. It is also a better electrical insulation than Transite and is comparable for mechanical strength. We, therefore, adopt Marinite for this heater.

In designing the outer jacket, we have arranged the upper section so that the cover bolts on the heater can be reached with a straight open wrench and socket wrenches will not be required.

The electrical terminals will be constructed as shown on drawing Z-930059. Our experiments on the glass covered terminal have demonstrated that we can guarantee this type for current loads as high as 600 amperes. The rated current per terminal for this heater is 395 amperes. We have, therefore, reduced the number of terminals to six and the heating element will be connected in two wye circuits, each of 300 Kw. capacity. The design of these electrical terminals permits the removal of any of them without removing the shell head.

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Carbide & Carbon Chemicals Corporation,
February 20, 1939

Drawing Y-920044 shows the overall dimensions and suggested locations for openings for control, etc. This may be modified to meet your requirements.

Yours very truly,

ELLIOTT COMPANY

(Signed) Francis P. Johnson

FPJ:AS

C O P Y

EQUIPMENT DEVELOPMENT LOG

REPORT SKETCH NO.	B. M. NO.	DATE	WORK ORDER	ITEM NO.
MATERIAL	REQ. NO.	DATE	NAME OF ITEM	Dowtherm Heater
DESCRIPTION	P. O. NO.	DATE	UNIT	Dowtherm Storage System
	P. C. NO.	DATE	PLANT	Maleic Anhydride Plant No. 1

PRELIMINARY

CORRESPONDENCE

CONFIRMATIONS

DATE Feb. 20, 1939 MFR. Elliott Company - #N-133-CI PRICE QUOTED \$4925.00 f.o.b. factory
Jeanette, Pa., without control

ONE (1) 600 KW Elliott Electric Diphenyl Heater.

SHELL: The inner shell will be vertical and will be 36" I.D. approximately 10 ft. in overall height. The shell will be made of flange quality steel plate electrically welded and constructed for 150# G. pressure, 750°F. and in accordance with Class #1 A.S.M.E. Code. It will be completely stress relieved and the longitudinal and girth seams will be X-rayed. All flanges will be of series 30 design to insure tightness.

HEATING ELEMENT: The heating element will consist of 12 nichrome ribbons each approximately 110 ft. long, .025" thick (#22 B&S gauge), 2" wide. These ribbons will be supported and insulated from each other by "Marinite" (Johns Manville's insulation made of asbestos fibre and inorganic binder). The distance between ribbon turns and between the ribbons themselves will be far enough to guard against any possible shorting due to vibration. This heating element is exceptionally sturdy and rugged.

TERMINALS: There will be a total of six terminals on this heater. Each terminal will be capable of carrying 600 amperes current when the unit is operating at 750°F. and 150#G. pressure. The terminals are designed as shown on an enclosed drawing (Z-930059). Each terminal is coated with a porcelain coating approximately 1/8" thick which will adequately insulate the terminal from the shell. The terminals are designed so that they can be removed from the shell without the necessity of removing the shell head.

INSULATION: The inner shell will be enclosed in an outer shell approximately 10" larger in diameter. The space between the two shells will be packed with "Banroc" insulating wool. The outer shell will be split at a point below the flange joint on the inner shell to allow removal of the top of the outer shell so that the inner shell cover can be removed with open end wrenches.

OVER

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DATE

MFR.

PRICE QUOTED

DESIGN: The unit will be designed to operate at a temperature of 750°F. and a pressure of 150#/sq.in.G. All parts of construction will be guaranteed to operate satisfactorily at this temperature and pressure.

The electric heater will be designed for low temperature differential between the heating surface and the liquid being heated.

The heating element will have two three phase wye circuits each having 300 kw. so that either or both of these can be in operation at any time. A schematic diagram showing the arrangement of the element is shown on outline drawing Y-920044.

HEAT TRANSFER MEDIUM: The heater will be designed for operation with Dowtherm (A) or other heat transfer medium which is not an electrical conductor and which does not decompose at the operating temperatures and pressures.

AUTOMATIC CONTROLS: All the controls, safety devices, etc., will be furnished by the customer. The shells will have the necessary openings required for the temperature controller, low level cut-off, safety valve, or other accessories.

GUARANTEE: The Elliott Company guarantees this electric heater to have sufficient capacity to deliver 2,050,000 BTU per hour (plus 5%, minus 0%) to the heat transfer medium flowing through the heater, when the heater is supplied 440 volt, 3 phase, 60 cycle electric current. The commercial limitations of the heating ribbon are such that the tolerance on heat transfer of plus 5%, minus 0% is necessary.

GUARANTEE: The Company warrants the machinery, so far as of its own manufacture, to be free from defects of material and workmanship, and should any part of it be found, under normal use and service, within ninety (90) days from the time of starting, and not more than one (1) year after date of shipment, to have been defective when shipped, the Company will repair or replace said part f.o.b. Jeannette, Pa., provided the original part is returned to Jeannette, Pa., transportation prepaid, and its inspection may establish the claim. The Company shall in no event be held liable for damage or delay caused by defective material or workmanship, and no allowance will be made for repairs or alterations unless made with its written approval. Outside purchased equipment and accessories, if any, are warranted only to the extent of the original manufacturer's warranty.

It is agreed that in the event that the Company is for any reason unable to fulfill the guarantee made on the apparatus covered by this contract, that the Company may remove said apparatus at its own expense.

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EQUIPMENT DEVELOPMENT LOG

Sheet 2 of 2

REPORT SKETCH NO. _____	B. M. NO. _____	DATE _____	WORK ORDER _____	ITEM NO. _____
MATERIAL _____	REQ. NO. _____	DATE _____	NAME OF ITEM _____	
DESCRIPTION _____	P. O. NO. _____	DATE _____	UNIT _____	
	P. C. NO. _____	DATE _____	PLANT _____	

PRELIMINARY
CORRESPONDENCE _____

CONFIRMATIONS _____

DATE _____ MFR. _____ PRICE QUOTED _____

and in payment of all liability, refund to the Purchaser any and all sums which may have been paid by said Purchaser on account of the purchase price herein named.

SHIPMENT: The machinery herein specified will be shipped sixty (60) days from receipt of approved drawings. Drawings to be submitted promptly upon receipt of order and complete information necessary for manufacture.

OVER

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