PLANT ITEM MATERIAL SELECTION DATA SHEET

HOP-HX-00002 & HOP-HX-00004 (HLW)
Silver Mordenite Preheater

- Design Inlet Temperature (°F) (hot side/cold side): 500/250
- Location: outcell

ISSUED BY RDP-WTP PDC
INIT DATE

Contents of this document are Dangerous Waste Permit affecting

Operating conditions are as stated on sheet 4

Operating Modes Considered:

- Equipment is maintainable.

Materials Considered:

Material (UNS No.)	Relative Cost	Acceptable Material	Unacceptable Material
Carbon Steel	0.23		X
304L (S30403)	1.00		X
316L (S31603)	1.18	X	
6% Mo (N08367/N08926)	7.64	X	
Alloy 22 (N06022)	11.4	X	
Ti-2 (R50400)	10.1		X

Recommended Material: 316 (max 0.030% C; dual certified)

Recommended Corrosion Allowance: NA

Process & Operations Limitations:

- None

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EXPIRES: 12/07/05

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This bound document contains a total of 4 sheets.

REV	DATE	REASON FOR REVISION	PREPARER	CHECKER	APPROVER
0	4/21/04	Issued for Permitting Use			

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Corrosion Considerations:

a General Corrosion
The anticipated dry-air conditions are not conductive to general corrosion and none is expected.

Conclusion
Either 304L or 316L would be satisfactory.

b Pitting Corrosion
Pitting corrosion will only be a concern if moisture is present. It is assumed that there will be no condensation in the unit. For conservatism, 316L is recommended.

Conclusion
At the stated operating conditions, pitting corrosion is not a significant concern. Recommend 316L.

c End Grain Corrosion:
End grain corrosion only occurs in high acid conditions and is not a concern.

Conclusion:
Not a concern

d Stress Corrosion Cracking
At operations at the stated temperatures, stress corrosion cracking will only be a concern in the presence of moisture. It is assumed that there will be no condensation in the unit. Also see Pitting.

Conclusion
At the stated operating conditions, stress corrosion cracking is not a concern.

e Crevice Corrosion
Crevice corrosion will only be a concern if moisture is present. It is assumed that this will be prevented by the presence of a preheater.

Conclusion
At the stated operating conditions, crevice corrosion is not a concern.

f Corrosion at Welds
Assuming dry air and proper welding procedures, corrosion at welds is not anticipated.

Conclusion
At the stated operating conditions, weld corrosion is not a concern.

g Microbiologically Induced Corrosion (MIC)
The stated operating conditions are not suitable for microbial growth.

Conclusion
At the stated operating conditions, MIC is not a concern.

h Fatigue/Corrosion Fatigue
Extreme temperature cycling or fluctuations are not expected during normal operations. During the life of the equipment such fluctuation are expected to be very infrequent.

Conclusion
At the expected operating conditions, corrosion fatigue is not a concern.

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i Vapor Phase Corrosion
Components essentially consist entirely of vapor space so general corrosion comments apply.

Conclusion:
See comments under general corrosion.

j Erosion
The velocity and solids content are sufficiently low that erosion is not a concern.

Conclusion
Erosion is not a concern.

k Galling of Moving Surfaces
There are no unlubricated moving surfaces present.

Conclusion:
Galling is not a concern.

l Fretting/Wear
No metal/metal contacting surfaces are expected.

Conclusion:
Fretting is not a concern.

m Galvanic Corrosion
No significantly dissimilar metals are present nor is moisture assumed to be present.

Conclusion:
Galvanic corrosion is not a concern.

n Cavitation
Cavitation is not expected in an off-gas system

Conclusion:
Cavitation is not a concern.

o Creep
Creep is not expected at stated operating conditions.

Conclusion
At the stated operating conditions, creep is not a problem.

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OPERATING CONDITIONS

Materials Selection Data

Component (Name/ID) HOP-HX-00002 & 4

System HLW-HOP

Operations

Chemicals	Unit	Normal Case Conditions		Maximum Case Conditions	
		Cold Side	Hot Side	Cold Side	Hot Side
CO	ppmv	39.5	1.91	64.1	3.11
NO_X	ppmv	606	29.3	2,650	129
NH_3	ppmv	67.6	109	60.7	290
SO_2	ppmv	4.65E-02	2.26E-03	3.15E-02	1.53E-03
HCl	ppmv	3.76E-03	3.63E-06	2.27E-02	2.20E-05
HF	ppmv	2.17E-01	2.10E-04	1.77	1.72E-03
I_2	ppmv	2.86E-09	2.76E-12	1.26E-04	1.22E-07
Hg	ppmv	2.26E-05	2.18E-05	9.86E-04	9.55E-04
SVOC	ppmv	5.48	2.64E-01	0.45	2.16E-02
VOC	ppmv	9.56E-08	1.71E-09	0.21	3.84E-03
Particulate	ppmv	3.07E-11	4.58E-12	8.46E-11	1.99E-11
Temperature (in/out)	°F	186/380	462/269	221/395	469/295