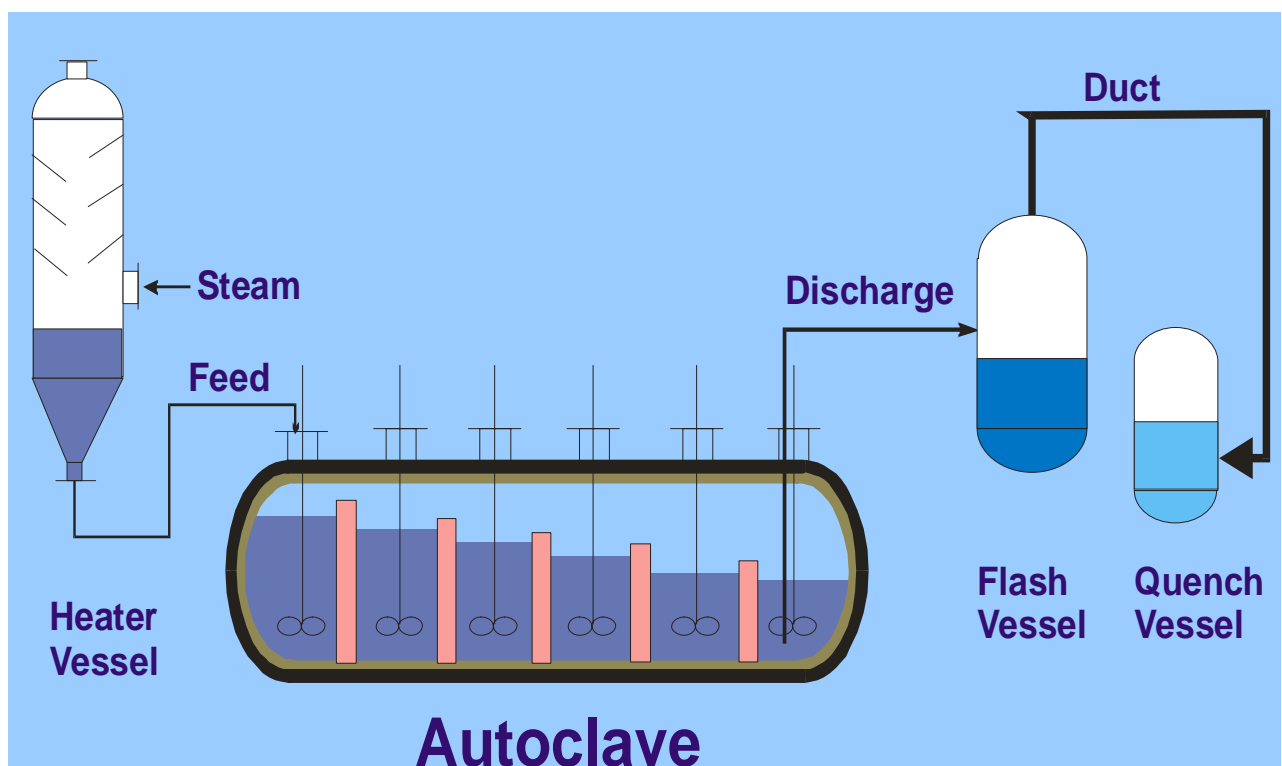


***DSB-Products and Services for the
High Pressure Acid Leaching
(HPAL)-INDUSTRY***



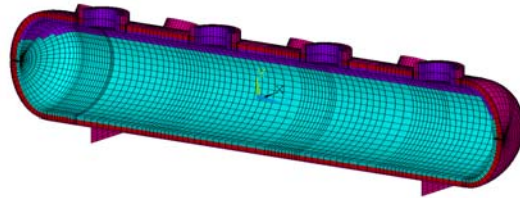
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1 SERVICES

Finite Element Analysis (FEA)

- Stress-Analysis
- Displacements of lining
- Temperature Profiles
- nozzle-sizes, -orientation

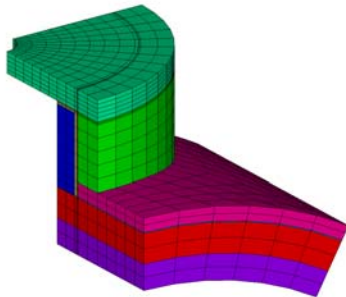


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MAT NUM

Berechnung: FBY-01-B001
Jobname : FBY01004
Nodes : 40034
Elements : 40036
Inputfile : FBY01004.inp Rev.: AA
Datafile : none.lnc
Plotfile : FBY010002.PNS
Copyright : Eng.Ausero Dr.-Ing. G.Lau
D-51447 Queresbach,
Rheinlandpfalz - Germany
Tel. +49 091 22 66 - 46 41 29

EXPANSION OF REFRACTORY INSIDE AN AUTOCLAVE
FE model (Overview - Materials)

Horizontal Autoclave Model (FEA) for bricks

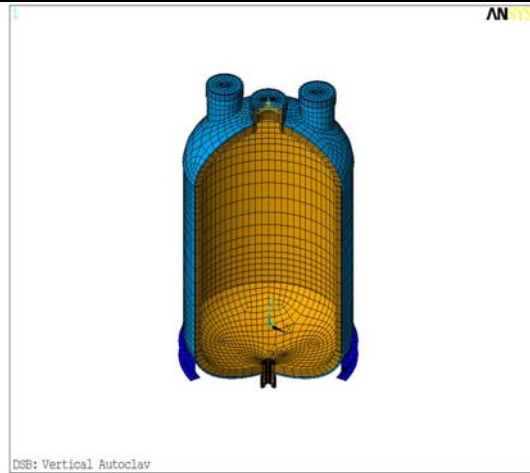


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MAR 19 2004
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MAT NUM

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Inputfile : FBY01001.inp Rev.: AA
Datafile : none.lnc
Plotfile : FBY010002.PNS
Copyright : Eng.Ausero Dr.-Ing. G.Lau
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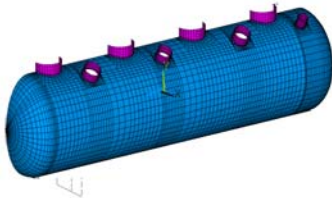
TEMPERATURE DISTRIBUTION IN AN INSULATED NOZZLE
FE-Model Overview Materials

3 dim. Temperature Profiles for nozzles



DSB: Vertical Autoclav

Vertical Flash Vessel/Autoclave Model

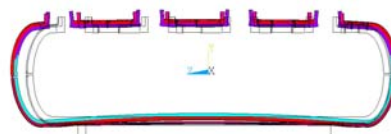


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TYPE NUM
ELEMENTS
TYPE NUM

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Elements : 40036
Inputfile : FBY01004.inp Rev.: AA
Datafile : none.lnc
Plotfile : FBY010002.PNS
Copyright : Eng.Ausero Dr.-Ing. G.Lau
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EXPANSION OF REFRACTORY INSIDE AN AUTOCLAVE
FE model - Material No: 4 - Paper

FEA-Modell for Steel shell clave



ANSYS 5.7.1
MAR 9 2004
19:16:29
PLOT NO. 47
DISPLACEMENT
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Jobname : FBY01010
Nodes : 40034
Elements : 40037
Inputfile : FBY01010.inp Rev.: AA
Datafile : none.lnc
Plotfile : FBY010002.PNS
Copyright : Eng.Ausero Dr.-Ing. G.Lau
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EXPANSION OF REFRACTORY INSIDE AN AUTOCLAVE
LC 5-5 - Deformation of structure at center line

Deformation Steel Vessel vs Bricklining

DSB-Lab-Autoclaves for Testing of

- Mortars,
 - Bricks,
 - SS,
 - Alloys,
 - Membranes
- Pressure drops,
 - Temperature drops,
 - Chemical swell,
 - Chrystal-Growth
 - High Chlorine, Fluorine contents



1000 ml Lab clave for mortar testing



500 ml Lab clave for Pressure drop testing



7500 ml Lab-clave for brick testing

Brick lining Engineering with:

- Brick-Lining drawings
- Brick- + Metal-Baffles
- Brick- + Metal-Dividing-Walls
- Nozzle design
- Impingement bloc



Nozzle Lining



Segment of dividing wall

Inspections with Assessment of :

- GRP-Membranes
- Rubber-Linings
- Brick-linings
- Inconel, Lead, Titanium claddings



2 SUPPLY AND INSTALLATION

2.1 *Membranes and Claddings*



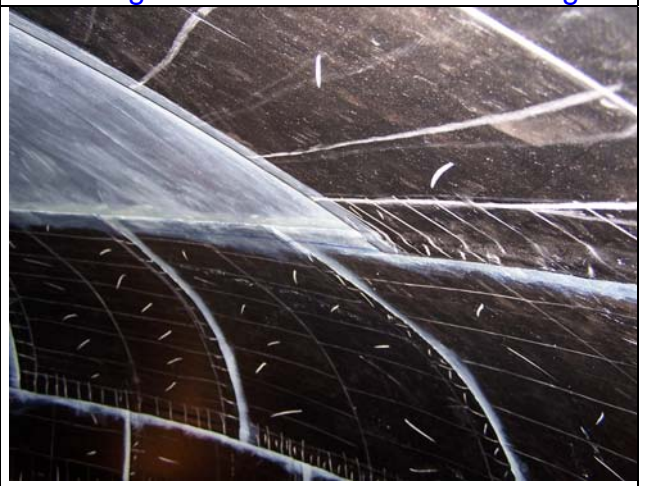
Inconel 625 membrane



Homogenous and clad Lead linings



Hard-Rubber membrane (Ebonite)



Self vulcanising Soft Rubber



GRP-Membranes



Troweled on coatings

2.2 Different type of Bricks and Mortars in HPAL-Vessels



Ceramic Bricks "Didier SF"



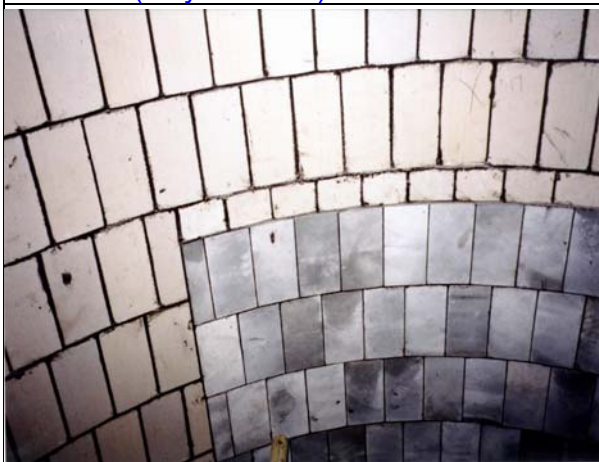
Low chemical swell brick "Didier AC"



Si-C (clay-bonded) Outlet nozzle bricks



AE Mortar for bedding Baffle brackets



Target field ,SiC-nitrate bonded



Impingement bloc, SiC-clay-bonded

2.3 Turnkey Projects



Autoclave Vessel Supply



Flash Vessel Supply



Metal-Dividing walls Supply



Plastic Insulating Blocs Supply



Metal-Inserts Supply, Ti, Hastelloy



Metal-Baffles Supply

2.4 Typical Work



Brick lining in Flash Tanks



Brick lining in Autoclaves



Nozzle Lining in vertical Clave



Dome Lining in vertical Clave



Shaped bricks for horizontal Clave-heads



Partial Relining of Autoclave



Double layer compression Ring



Brick-wall with inverted arch overflow