
79319845_komplett

07/26/2005 ASU KOSICE

11:12 AM

REBIS

AutoPIPE 6.20 MODEL PAGE 2

**
** AUTOPIPE SYSTEM INFORMATION **
**

SYSTEM NAME : 79319845_komplett

PROJECT ID : ASU KOSICE

DESCRIPTION :

PREPARED BY : _____
WEGSTEIN

CHECKED BY : _____
FRICKHOEFER

PIPING CODE : B31.3

VERTICAL AXIS : Z

AMBIENT TEMPERATURE : 20.0 deg C

COMPONENT LIBRARY : HANAU_AL

MATERIAL LIBRARY : AUTOB313

MODEL REVISION NUMBER : 0

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 3

C O M P O N E N T D A T A L I S T I N G

*** SEGMENT A , LINE # 79319845

From A00 to A01, DX= -499.68 mm, DY= 349.88 mm, L= 610.00 mm Run

PIPE DATA:

Pipe Id= 400MX6.0, Material= AL, Poisson= 0.300, Nom Size= 400 mm,
OD= 406.00 mm, Sch= 6.0, Wall Thk= 6.000 mm, Mill= 0.750 mm, Cor= 0 mm,
Pipe Density= 2707.12 kg/m3, Pipe Unit Wgt= 200.17 N/m, Insul Thk= 0 mm,
Lining Thk= 0 mm, Long Weld factor= 1.00, Circ Weld factor= 1.00,
Long Modulus= 0.06899 x10⁶ N/m, Hoop Modulus= 0.06899 x10⁶ N/m,
Shear Modulus= 0.02653 x10⁶ N/m, Sc= 103.4 N/mm2, Syc= 0 N/mm2

OPERATING DATA:

P1= 0 N/mm2, T1= -196.00 deg C, Exp1= -3.84587 mm/m,
E1= 0.07646 x10⁶ N/m, Sh1= 71.00 N/mm2

POINT DATA:

A00, Coordinates, X= 0.00 mm, Y= 0.00 mm, Z= 0.00 mm

From A01 to A03, DZ= 2471.78 mm Bend

COMPONENT DATA (Bend, TIP= A01, Near= A01 N, Far= A01 F):

Elbow, Radius= 609.99 mm, Bend angle= 90.00 deg, End flanges= 0,
Flex= 18.033, SIFI= 4.43, SIFO= 3.69

PIPE DATA (A01 F to A03 N):

Pipe Id= 400MX4.0, Nom Size= 400 mm, Sch= 4.0, Wall Thk= 4.000 mm,
Mill= 0.500 mm

POINT DATA:

A01, Coordinates, X= -499.68 mm, Y= 349.88 mm, Z= 0.00 mm
A01 N, Coordinates, X= -0.01 mm, Y= 0.00 mm, Z= 0.00 mm
A01 F, Coordinates, X= -499.68 mm, Y= 349.88 mm, Z= 609.99 mm

SUPPORT DATA:

A01 N, Anchor, KTX= Rigid, KTY= Rigid, KTZ= Rigid, KRX= Rigid,
KRY= Rigid, KRZ= Rigid

From A03 to A04, DX= 499.68 mm, DY= -349.88 mm, L= 610.00 mm Bend

COMPONENT DATA (Bend, TIP= A03, Near= A03 N, Far= A03 F):

Elbow, Radius= 609.99 mm, Bend angle= 90.00 deg, End flanges= 0,
Flex= 18.033, SIFI= 4.43, SIFO= 3.69

PIPE DATA (A03 N to A03 F):

Pipe Id= 400MX6.0, Nom Size= 400 mm, Sch= 6.0, Wall Thk= 6.000 mm,
Mill= 0.750 mm

POINT DATA:

A03, Coordinates, X= -499.68 mm, Y= 349.88 mm, Z= 2471.78 mm

A03 N, Coordinates, X= -499.68 mm, Y= 349.88 mm, Z= 1861.79 mm

79319845_komplett

07/26/2005 ASU KOSICE

11:12 AM

REBIS

AutoPIPE 6.20 MODEL PAGE 4

C O M P O N E N T D A T A L I S T I N G

A03 F, Coordinates, X= -0.01 mm, Y= 0.00 mm, Z= 2471.78 mm

A04, Coordinates, X= 0.00 mm, Y= 0.00 mm, Z= 2471.78 mm

SUPPORT DATA:

A03 F, Anchor, KTX= Rigid, KTY= Rigid, KTZ= Rigid, KRX= Rigid,
KRY= Rigid, KRZ= Rigid

Number of points in the system: 8

Weight of Empty Pipes + Weight of Contents = Total Weight of System
56.2 kg + 0.0 kg = 56.2 kg

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 5

C O O R D I N A T E S D A T A L I S T I N G

POINT	-----COORDINATE (mm)-----		
NAME	X	Y	Z
*** SEGMENT A , LINE # 79319845			
A00	0.00	0.00	0.00
A01 N	-0.01	0.00	0.00
A01	-499.68	349.88	0.00
A01 F	-499.68	349.88	609.99
A03 N	-499.68	349.88	1861.79
A03	-499.68	349.88	2471.78
A03 F	-0.01	0.00	2471.78
A04	0.00	0.00	2471.78

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 6

P I P E D A T A L I S T I N G

Pipe ID/ Material	Nom/ Sch	O.D. mm	-----Thickness(mm)----- W.Th. Corr Mill Insu Ling	Spec Grav	Weight(N/m) Pipe Other Total	ZL/ ZC
400MX6.0 AL	400 6.0	406.00	6.000 0 0.75 0 0	0	200 0 200	1.00 1.00
400MX4.0 AL	400 4.0	406.00	4.000 0 0.50 0 0	0	134 0 134	1.00 1.00

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 7

M A T E R I A L D A T A L I S T I N G

Material Name	Pipe ID	Density kg/m3	Pois. Ratio	Temper. deg C	Modulus x10 ⁶ N/ Axial	Hoop	Shear	Expans. mm/m
AL	400MX6.0	2707.1	0.30	20.0 -196.0	0.06899 0.07646	0.06899	0.02653	-3.8459
AL	400MX4.0	2707.1	0.30	20.0 -196.0	0.06899 0.07646	0.06899	0.02653	-3.8459

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 8

M A T E R I A L A L L O W A B L E D A T A L I S T I N G

Material Name	Pipe ID	Temper. deg C	Allow. N/mm2	Yield N/mm2
AL	400MX6.0	20.0 -196.0	103.42 71.00	0.00
AL	400MX4.0	20.0 -196.0	103.42 71.00	0.00

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 9

TEMPERATURE AND PRESSURE DATA

	-----C A S E 1-----	-----C A S E 2-----	-----C A S E 3-----
POINT	PRESS. TEMPER EXPAN.	PRESS. TEMPER EXPAN.	PRESS. TEMPER EXPAN.
NAME	N/mm2 deg C mm/m	N/mm2 deg C mm/m	N/mm2 deg C mm/m

*** SEGMENT A , LINE # 79319845

A00	0	-196	-3.846
A04	0	-196	-3.846

79319845_komplett

07/26/2005 ASU KOSICE

11:12 AM

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AutoPIPE 6.20 MODEL PAGE 10

H O T M O D U L U S (x10⁶ N/)

POINT

NAME	CASE 1	CASE 2	CASE 3
------	--------	--------	--------

*** SEGMENT A , LINE # 79319845

A00	0.07646		
-----	---------	--	--

A04	0.07646		
-----	---------	--	--

* Non-standard material

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07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 11

	H O T			A L L O W A B L E S (N/mm2)					
	-----C A S E 1-----			-----C A S E 2-----			-----C A S E 3-----		
POINT	NOT	NOT		NOT	NOT		NOT	NOT	
NAME	ALLOW	USED	USED	ALLOW	USED	USED	ALLOW	USED	
	-----	-----	-----	-----	-----	-----	-----	-----	

*** SEGMENT A , LINE # 79319845

A00 71.00*

A04 71.00*

< User-defined code allowable
* Non-code material

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 MODEL PAGE 12

THERMAL ANCHOR MOVEMENTS AND DISPLACEMENTS

POINT NAME	LOAD CASE	DX (mm)	DY (mm)	DZ (mm)	RX (deg)	RY (deg)	RZ (deg)
A01 N	Thermal 1	3.80	-2.70	-117.80	0.000	0.000	0.000
A03 F	Thermal 1	3.80	-2.70	-127.90	0.000	0.000	0.000

REBIS
AutoPIPE 6.20 RESULT PAGE 1

Point name	Load combination	TRANSLATIONS (mm)			ROTATIONS (deg)		
		X	Y	Z	X	Y	Z
*** Segment A begin *** Line # 79319845							
A00	T1	3.800	-2.700	-117.800	0.000	0.000	0.000
A01 N	T1	3.800	-2.700	-117.800	0.000	0.000	0.000
A01 F	T1	5.502	-3.892	-120.435	-0.003	-0.004	0.000
A03 N	T1	5.502	-3.892	-125.265	0.003	0.004	0.000
A03 F	T1	3.800	-2.700	-127.900	0.000	0.000	0.000
A04	T1	3.800	-2.700	-127.900	0.000	0.000	0.000
*** Segment A end *** Line # 79319845							

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 RESULT PAGE 2

R E S T R A I N T R E A C T I O N S

Point name	Load combination	X	FORCES (N Y	Z	Result	X	MOMENTS (Nm Y	Z	Result
A01 N	Anchor T1	0	0	-4231	4231	-970	-1385	0	1691
A03 F	Anchor T1	0	0	4231	4231	970	1385	0	1691

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 RESULT PAGE 3

G L O B A L F O R C E S & M O M E N T S

Point	Load	FORCES (N)				MOMENTS (Nm)			
name	combination	X	Y	Z	Result	X	Y	Z	Result

*** Segment A begin *** Line # 79319845

A00	T1	0	0	0	0	0	0	0	0
A01 N-	T1	0	0	0	0	0	0	0	0
A01 N+	T1	0	0	4231	4231	970	1385	0	1691
A01 F	T1	0	0	4231	4231	-511	-729	0	890
A03 N	T1	0	0	4231	4231	-511	-729	0	890
A03 F-	T1	0	0	4231	4231	970	1385	0	1691
A03 F+	T1	0	0	0	0	0	0	0	0
A04	T1	0	0	0	0	0	0	0	0

*** Segment A end *** Line # 79319845

REBIS
AutoPIPE 6.20 RESULT PAGE 4

[illegible]

A00	Max P					(3a)	HOOP	0	71	
	Max P	0	0	1.00	1.00	(18)	SUST	0	71	
	Cold to T1	0	0	0	1.00	1.00	(17)	DISP	0	147
A01 N-	Max P					(3a)	HOOP	0	71	
	Max P	0	0	1.00	1.00	(18)	SUST	0	71	
	Cold to T1	0	0	0	1.00	1.00	(17)	DISP	0	147
A01 N+	Max P					(3a)	HOOP	0	71	
	Max P	0	0	4.43	3.69	(18)	SUST	0	71	
	Cold to T1	1691	0	0	4.43	3.69	(17)	DISP	10	147
A01 F-	Max P					(3a)	HOOP	0	71	
	Max P	0	0	4.43	3.69	(18)	SUST	0	71	
	Cold to T1	890	0	0	4.43	3.69	(17)	DISP	5	147
A01 F+	Max P					(3a)	HOOP	0	71	
	Max P	0	0	1.00	1.00	(18)	SUST	0	71	
	Cold to T1	729	511	0	1.00	1.00	(17)	DISP	2	147
A03 N-	Max P					(3a)	HOOP	0	71	
	Max P	0	0	1.00	1.00	(18)	SUST	0	71	
	Cold to T1	729	511	0	1.00	1.00	(17)	DISP	2	147
A03 N+	Max P					(3a)	HOOP	0	71	
	Max P	0	0	4.43	3.69	(18)	SUST	0	71	
	Cold to T1	890	0	0	4.43	3.69	(17)	DISP	5	147
A03 F-	Max P					(3a)	HOOP	0	71	
	Max P	0	0	4.43	3.69	(18)	SUST	0	71	
	Cold to T1	1691	0	0	4.43	3.69	(17)	DISP	10	147
A03 F+	Max P					(3a)	HOOP	0	71	
	Max P	0	0	1.00	1.00	(18)	SUST	0	71	
	Cold to T1	0	0	0	1.00	1.00	(17)	DISP	0	147
A04	Max P					(3a)	HOOP	0	71	
	Max P	0	0	1.00	1.00	(18)	SUST	0	71	
	Cold to T1	0	0	0	1.00	1.00	(17)	DISP	0	147

*** Segment A end *** Line # 79319845

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 RESULT PAGE 5

S Y S T E M S U M M A R Y

Maximum displacements (mm)

Maximum X :	5.502	Point : A01 F	Load Comb.: T1
Maximum Y :	-3.892	Point : A01 F	Load Comb.: T1
Maximum Z :	-127.900	Point : A03 F	Load Comb.: T1
Max. total:	127.985	Point : A03 F	Load Comb.: T1

Maximum rotations (deg)

Maximum X :	0.003	Point : A03 N	Load Comb.: T1
Maximum Y :	0.004	Point : A03 N	Load Comb.: T1
Maximum Z :	0.000	Point : A03 N	Load Comb.: T1
Max. total:	0.005	Point : A03 N	Load Comb.: T1

Maximum restraint forces (N)

Maximum X :	0	Point : A01 N	Load Comb.: T1
Maximum Y :	0	Point : A01 N	Load Comb.: T1
Maximum Z :	-4231	Point : A01 N	Load Comb.: T1
Max. total:	4231	Point : A01 N	Load Comb.: T1

Maximum restraint moments (Nm)

Maximum X :	970	Point : A03 F	Load Comb.: T1
Maximum Y :	1385	Point : A03 F	Load Comb.: T1
Max. total:	1691	Point : A03 F	Load Comb.: T1

79319845_komplett

07/26/2005 ASU KOSICE

11:12 AM

REBIS

AutoPIPE 6.20 RESULT PAGE 6

S Y S T E M S U M M A R Y

Maximum pipe forces (N)

Maximum X :	0	Point : A03 F	Load Comb.: T1
Maximum Y :	0	Point : A03 F	Load Comb.: T1
Maximum Z :	4231	Point : A01 N	Load Comb.: T1
Max. total:	4231	Point : A01 N	Load Comb.: T1

Maximum pipe moments (Nm)

Maximum X :	970	Point : A03 F	Load Comb.: T1
Maximum Y :	1385	Point : A03 F	Load Comb.: T1
Maximum Z :	0	Point : A01 N	Load Comb.: T1
Max. total:	1691	Point : A03 F	Load Comb.: T1

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 RESULT PAGE 7

S Y S T E M S U M M A R Y

Maximum displacement stress

Point : A03 F
Stress N/mm2 : 10
Allowable N/mm2 : 147
Ratio : 0.07
Load combination : Cold to T1

79319845_komplett
07/26/2005 ASU KOSICE
11:12 AM

REBIS
AutoPIPE 6.20 RESULT PAGE 8

S Y S T E M S U M M A R Y

Maximum displacement stress ratio

Point : A03 F
Stress N/mm2 : 10
Allowable N/mm2 : 147
Ratio : 0.07
Load combination : Cold to T1

* * * The system satisfies ASME B31.3 code requirements * * *
* * * for the selected options * * *