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Pressure Vessel Engineering Ltd. provides: ASME Vessel Code Calculations - Finite Element Analysis (FEA) - Solid Modeling / Drafting - Canadian Registration Number (CRN) Assistance

# Comment: Only ASME can make interpretations on the ASME VIII-1 Code

## Weld Efficiencies for ASME VIII-1 vessels - Section UW-11(a)(5)(b)

### Part 1 - introduction

I have long struggled with the weld efficiencies presented in section UW of the ASME VIII-1 code. I have had more trouble with it than many other sections of the book combined. The ideas in this section are simple, but the ASME code written around it is anything but. Where ASME has not made the code readable, we must live with confused and diverging interpretations.

The problem area is sections UW-11 and UW-12 and any section of the code that references UW-11(a)(5)(b) - and there are many. What weld efficiencies to use when seams with different efficiencies intersect? I do not believe that circ weld efficiencies can affect longitudinal efficiencies however; these rules as presented in UW-12 and UW-11(a)(5)(b) exist and must be dealt with. I do believe that I will have to read the infinitely confusing sentence UW-11(a)(5)(b) many more times in my career.

I and others have tried to reason their way through this section of the code. An example can be found at <u>http://www.authorizedinspector.com/Joint%20Efficiencies.htm</u> I think what I present here agrees with their interpretation, but I do not like this method. Even if you agree with what is presented, then you still have to persuade others - best of luck.

Only ASME can provide interpretations as to what this code means, and someone can ask them, but - how about doing something simple instead? Samples of what the code committee wants can be found in appendix L. In specific samples L-1.5.1 through L-1.6.3 show the correct weld efficiency to use with differing radiography, and they also show the effect of circ efficiency on long seams. The meaning of UW-11(a)(5)(b) can be inferred.

This article comments on the 6 sample vessels found in Appendix L. A simple spreadsheet is introduced that calculates the same weld efficiencies. The spreadsheet can be downloaded from <u>http://www.pveng.com/documents/content\_156.xls</u> Each Appendix L sample is calculated at the end of this article.

Pressure Vessel Engineering Ltd. assumes no responsibility for this sheets use, and reminds you that only ASME can provide code interpretations. We would however be very happy if everyone could use the same interpretation to this difficult code section.

### This article is appended Oct 21-2014

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## Part 2 - samples from Appendix L-1.5 with Comments



### Example L-1.5.1

Comments:

- 1) All efficiencies are from table UW-12
- 2) Nozzle or sump has no effect on the shell efficiencies (Type 8 in table UW-12 corner joints have an efficiency of 1.0. (This is true for all examples in Appendix L-1.5)
- 3) The long and circ efficiency on shells and pipes is tracked separately and both are calculated
- 4) The shell circ weld efficiency is different at each end. 1.0 for the Type 1 and 0.9 for the type 2 joint. The lower efficiency governs.

Oct 21-2104 Note: These samples from Appendix L are no longer in the ASME VIII-1 code book.



### Comments:

- 1)
- E = 0.85 for the sump per UW-12(d) All other efficiencies are from Table UW-12 2)



Comments:

- 1) E = 0.85 for the SE and F&D heads per UW-12(d)
- 2) The circ weld on the Hemispherical head is part of the head. The 0.7 efficiency for the Type 1 joint with no RT (from table UW-12) becomes the head efficiency as well.
- 3) E = 0.85 for the shell log seam efficiency, *even though there is no long seam*. There is no different than the heads
- 3) All other efficiencies are from Table UW-12



### Comments:

1) All efficiencies are from Table UW-12



Comments:

- 1) Long seam efficiency for the sump is incorrectly shown as 0.65 in the code book (the correct value of 0.8 can be found in sample L-1.5.6)
- 1) All efficiencies are from Table UW-12



Comments:

- 1) This case shows that UW-11(a)(5)(b) can be satisfied for a vessel with spot radiography on the long seam. The heads have imaginary long seam welds with the equivalent of 100% radiography *as required by UW-11(a)*. The radiography in question is not that of the adjoining rolled shell which has no effect on the elliptical head, but that on the imaginary long seam in the head which is 100%. UW-11(a)(5)(b) is met for the semi elliptical head of this vessel, but not for the shell. The semi-elliptical head can have an efficiency of 1.0. This is the leading cause of disagreement on allowable weld efficiencies.
- Note: If your authorized inspector or review engineer does not agree that this example L-1.5.6 is correct, then they are implying that the adjacent shell affects the efficiency of the head. This sample shows that this effect does not exist. If you lose your argument, you will have to fully radiograph the long seam. This design change involves extra cost, but material does not have to be re-ordered / re-worked.
- 2) All efficiencies are from table UW-12
- 3) See L-1.5.3 comment on the hemispherical head efficiency.

### Note Added Oct 21 2014:

"PTB-4-2013 ASME Section VIII - Division 1 Example Problem Manual" contradicts this sample. See PTB-4 page 441 box for "Full Radiography, RT-2" box UW-11(1)(5) (b) and page 445 example E7.2:

- The vessel long seam does not have 100% RT, so UW-11(a)(5)(b) has not been met for the main shell. SE head efficiency changes from 1.0 to 0.85 due to UW-12(d)

- If the long seam did have 100% RT, Shell and sump circ joint efficiency would change from 0.8 to 0.65 because the spot RT would be used to support the 1.0 long seam efficiency, and could not also be used to support the circ weld efficiency

- Sump shell long efficiency and sump head efficiency remains at 1.0 because UW-11(a)(5)(b) has been met for the sump.



## Example L-1.6.1(a)

### Comments:

1) All efficiencies are from table UW-12



## Example L-1.6.1(b)

### Comments:

1) All efficiencies are from table UW-12



Comments:

1) All efficiencies are from table UW-12



Comments:

- 1) All efficiencies are from table UW-12
- 2) The two shells are welded using either type number 3, 4, 5 or 6 welds

## Part 3 - Radiography Rules

These weld efficiency rules are derived from the above examples

1) Start with all weld efficiencies from table UW-12 - these are the efficiencies in isolation of any other welds. Other rules below may lower the allowed efficiencies where applicable.

2) Nozzles or sumps attached with corner joints have no effect on the efficiency of the shells they are attached to

3.1) Track both the long and circ efficiency for a pipe or rolled shell. The shell required thickness (or allowed operating pressure) must be calculated for both directions.

3.2) When a shell has different circ efficiencies at each end, the lower efficiency governs.

3.3) When there is no RT on a circ connection, the maximum body long seam efficiency is 0.85 per UW-12(d). Maximum efficiency of an imaginary weld seam is also 0.85 (same as for a head).

4) If there are seams in the head, reduce efficiency as required per Table UW-12

5) A Hemispherical head is different from F&D and SE. The efficiency of the Hemi head is the lowest of the attachment efficiency or any seam in the head.

## Part 4 - Samples from weld efficiency sheet follow...

Laurence Brundrett Pressure Vessel Engineering Ltd. Revised Dec 15 2008 (Original Sept 8 2008) Revised Oct 21 2014

Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW
A	SME Sample L-1.5.1 for Main Body	roject
Left Head: [Cate	gory A] - long seam weld in head, not	t head to shell weld
Hemispherical	Left head	UW12 Column for this weld a
Seamless	Left head weld type	UW12 Column for joining circ weld a
Seamless	Left head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Left Circ Weld: [	Lategory A, B, C or Dj	
Double	Left head to body circ-weld type	
Fuii	Left field to body circ-weid radiograph	L off circ wold officioney 1 00
Dedu Lenn Ceen	er Costonome Al	
Body Long Sean	Reduleng weld type	111/12 column for the hady long coom
Soamloss	Body long-weld radiography	UW12 column for left airs wold
Seanness	Body long-weid radiography	LIW12 column for right circ weld
	left circ efficiency 1	Isolated long seam efficiency 1 00
	right circ efficiency 0.9	Allowed UW12 Column
	Allowed Circ Efficiency 0.90	Allowed Long Seam Efficiency 1.00
<b>Right Circ Weld:</b>	[Category A. B. C or D]	
Single W Backing	Right head to body circ-weld type	UW12 Column a
Full	Right head to body circ-weld radiogram	Circ seam type number 2
	· · ·	Right circ weld efficiency 0.90
Right Head: [Cat	egory A] - long seam weld in head, n	ot head to shell weld
Semi-Elliptical	Right head	UW12 Column for this weld a
Seamless	Right head weld type	UW12 Column for joining circ weld a
Seamless	Right head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Notes:	S	Sketch:
UW-11(a)(5)(b) is met	for the left head	
UW-11(a)(5)(b) is met	for the body	
UW-11(a)(5)(b) is met	tor the right head	
Comments: This sheet is for education	ational use only Only ASME can make code inte	proretations
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Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW
	ASME Sample L-1.5.1 for Sump	Project
Left Head: [Cate	gory A] - long seam weld in head, no	t head to shell weld
Corner	Left head	UW12 Column for this weld a
Corner	Left head weld type	UW12 Column for joining circ weld a
None	Left head weld radiography	Weld Type Number 7
		Isolated long seam efficiency 1.00
		Allowed UW 12 Column a
		Anowed head Enciency 1.00
Left Circ Weid: [	Lategory A, B, C or Dj	1114/42 Column for this world a
Nono	Left head to body circ-weld radiograp	Circ accorn time number 7
None	Left field to body circ-weid radiograp	Loft circ wold officionau 1 00
Dedu Lenn Ceen	er Costonom Al	
Body Long Sean	n: [Category A] Body long wold type	
Seamless	Body long weld radiography	UW12 column for the body long seam a
Jeanness	Body long-weld radiography	UW12 column for right airs wold
	left circ efficiency 1	Isolated long seam efficiency 1 00
	right circ efficiency 0.9	Allowed UW12 Column
	Allowed Circ Efficiency 0.90	Allowed Long Seam Efficiency 1.00
<b>Right Circ Weld:</b>	[Category A B C or D]	
Single W Backing	Right head to body circ-weld type	UW12 Column a
Full	Right head to body circ-weld <b>radiogra</b>	circ seam type number 2
		Right circ weld efficiency <b>0.90</b>
Right Head: [Cat	egory A1 - long seam weld in head, r	ot head to shell weld
F&D	Right head	UW12 Column for this weld a
Seamless	Right head <b>weld type</b>	UW12 Column for joining circ weld a
Seamless	Right head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Notes:	\$	Sketch:
		<mark>_</mark>
UW-11(a)(5)(b) is met	for the left head	
UW-11(a)(5)(b) is met	for the body	· · · · · · · · · · · · · · · · · · ·
UW-11(a)(5)(b) is met	for the right head	•
Comments:		
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		ASIVIE VIII-I SECIIOII UVV
A	SME Sample L-1.5.2 for Main Body	Project
Left Head: [Cate	gory A] - long seam weld in head, no	ot head to shell weld
Hemispherical	Left head	UW12 Column for this weld a
Seamless	Left head weld type	UW12 Column for joining circ weld <b>a</b>
Seamless	Left head weld radiography	Weld Type Number 0
		Isolated long seam efficiency <b>1.00</b>
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Left Circ Weld: [	Category A, B, C or D]	
Double	Left head to body circ-weld type	UW12 Column for this weld a
Full	Left head to body circ-weld radiograp	hy Circ seam type number 1
		Left circ weld efficiency <b>1.00</b>
Body Long Sean	n: [Category A]	
Seamless	Body long weld type	UW12 column for the body long seam a
Seamless	Body long-weld radiography	UW12 column for left circ weld a
		UW12 column for right circ weld <b>b</b>
		Long seam type number 0
	left circ efficiency 1	Isolated long seam efficiency 1.00
	right circ efficiency 0.8	Allowed UW12 Column a
	Allowed Circ Efficiency 0.80	Allowed Long Seam Efficiency 1.00
Right Circ Weld:	[Category A, B, C or D]	
Single_W_Backing	Right head to body circ-weld type	UW12 Column b
Spot	Right head to body circ-weld radiogra	phy Circ seam type number 2
		Right circ weld efficiency <b>0.80</b>
Right Head: [Cat	egory A] - long seam weld in head, r	not head to shell weld
Semi-Elliptical	Right head	UW12 Column for this weld a
Seamless	Right head weld type	UW12 Column for joining circ weld <b>b</b>
Seamless	Right head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW12 Column a
		Allowed Head Emiciency 1.00
Notes:		Sketch:
UW-11(a)(5)(b) is met	for the left head	
UW-11(a)(5)(b) is met	for the body	
UW-11(a)(5)(b) is met	for the right head	
Comments:	ational use only Only ASME can make code int	orprototione
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Vessel Weld Efficiency ver 1.00	ASME VIII-1 Section UW
ASME Sample L-1.5.2 for Sump	Project
Left Head: [Category A] - long seam weld in head,	not head to shell weld
Corner Left head	UW12 Column for this weld a
Corner Left head weld type	UW12 Column for joining circ weld <b>a</b>
None Left head weld radiography	Weld Type Number <b>7</b>
	Isolated long seam efficiency <b>1.00</b>
	Allowed UW12 Column a
	Allowed Head Efficiency 1.00
Left Circ Weld: [Category A, B, C or D]	
<b>Corner</b> Left head to body circ-weld type	UW12 Column for this weld a
None Left head to body circ-weld radiogra	phy Circ seam type number 7
	Left circ weld efficiency <b>1.00</b>
Body Long Seam: [Category A]	
Seamless Body long weld type	UW12 column for the body long seam a
Seamless Body long-weld radiography	UW12 column for left circ weld a
	UW12 column for right circ weld c
	Long seam type number 0
left circ efficiency 1	Isolated long seam efficiency 1.00
right circ efficiency 0.65	Allowed UW12 Column b
Allowed Circ Efficiency 0.65	Allowed Long Seam Efficiency 0.85
Right Circ Weld: [Category A, B, C or D]	
Single_W_Backing Right head to body circ-weld type	UW12 Column c
None Right head to body circ-weld radiog	raphy         Circ seam type number         2
	Right circ weld efficiency 0.65
Right Head: [Category A] - long seam weld in head	, not head to shell weld
F&D Right head	UW12 Column for this weld a
Seamless Right head weld type	UW12 Column for joining circ weld c
Seamless Right head weld radiography	Weld Type Number 0
	Isolated long seam efficiency <b>1.00</b>
	Allowed UW12 Column b
	Allowed Head Efficiency 0.85
Notes:	Sketch:
Body efficiency is reduced by head to body welds	
	*
Right head efficiency is reduced by right head to body weld	
UW-11(a)(5)(b) is met for the left head	
UW-11(a)(5)(b) is NOT met for the body	
UW-11(a)(5)(b) is NUT met for the right head	
Comments:	
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Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW
A	SME Sample L-1.5.3 for Main Body	Project
Left Head: [Cate	gory A] - long seam weld in head, no	t head to shell weld
Hemispherical	Left head	UW12 Column for this weld a
Seamless	Left head weld type	UW12 Column for joining circ weld c
Seamless	Left head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW12 Column c
		Allowed Head Emclency 0.70
Left Circ Weld: [	Category A, B, C or Dj	
Double	Left head to body circ-weid type	UW12 Column for this weld <b>c</b>
None	Left field to body circ-weid radiograp	Left eire weld efficiency 0.70
De la Leve Oren	- 10- (s	Left circ weld eniciency 0.70
Body Long Sean	1: [Category A]	
Seamless	Body long weld rediegraphy	UW 12 column for the body long seam a
Seamless	Body long-weid radiography	UW12 column for left circ weld C
	left circ efficiency 07	Isolated long seam efficiency 1 00
	right circ efficiency 0.65	Allowed LIW12 Column b
	Allowed Circ Efficiency 0.65	Allowed Long Seam Efficiency 0.85
<b>Right Circ Weld:</b>	[Category A B C or D]	<b>o , , , , , , , , , ,</b>
Single W Backing	Right head to body circ-weld type	LIW12 Column
None	Right head to body circ-weld radiogra	phy Circ seam type number 2
		Right circ weld efficiency 0.65
Right Head: ICat	egory A1 - long seam weld in head u	not head to shell weld
Semi-Elliptical	Right head	UW12 Column for this weld a
Seamless	Right head <b>weld type</b>	UW12 Column for joining circ weld c
Seamless	Right head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW12 Column b
		Allowed Head Efficiency 0.85
Notes:		Sketch:
Left head efficiency is	reduced by left circ-weld efficiency	
Body efficiency is redu	iced by head to body welds	
Right head efficiency i	s reduced by right head to body weld	
UW-11(a)(5)(b) is NO	I met for the left head	
UW-11(a)(5)(b) is NO	I met for the body	
This sheet is for educe	ational use only Only ASME can make code int	ernretations
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Vessel Weld Efficiency ver 1.00	ASME VIII-1 Section UW	
ASME Sample L-1.5.3 for Sump	Project	
Left Head: [Category A] - long seam weld in head, n	ot head to shell weld	
Corner Left head	UW12 Column for this weld a	
Corner Left head weld type	UW12 Column for joining circ weld a	
None Left head weld radiography	Weld Type Number 7	
	Isolated long seam efficiency <b>1.00</b>	
	Allowed UW12 Column a	
	Allowed Head Efficiency 1.00	
Left Circ Weld: [Category A, B, C or D]		
<b>Corner</b> Left head to body circ-weld type	UW12 Column for this weld a	
None Left head to body circ-weld radiogra	phy Circ seam type number 7	
	Left circ weld efficiency <b>1.00</b>	
Body Long Seam: [Category A]		
Seamless Body long weld type	UW12 column for the body long seam a	
Seamless Body long-weld radiography	UW12 column for left circ weld a	
	UW12 column for right circ weld c	
	Long seam type number <b>0</b>	
left circ efficiency 1	Isolated long seam efficiency <b>1.00</b>	
right circ efficiency 0.65	Allowed UW12 Column b	
Allowed Circ Efficiency 0.65	Allowed Long Seam Efficiency 0.85	
Right Circ Weld: [Category A, B, C or D]		
Single_W_Backing Right head to body circ-weld type	UW12 Column c	
None Right head to body circ-weld radiogr	aphy Circ seam type number 2	
	Right circ weld efficiency 0.05	
Right Head: [Category A] - long seam weld in head,	not head to shell weld	
F&D Right head	UW12 Column for this weld a	
Seamless Right head weld type	UW12 Column for joining circ weld c	
Seamless Right head weld radiography	Weld Type Number 0	
	Isolated long seam efficiency <b>1.00</b>	
	Allowed UW12 Column b	
	Allowed Head Efficiency 0.85	
Notes:	Sketch:	
Body efficiency is reduced by head to body welds		
Divisit lead officiance is very and by visited lead to be drawed d		
Right head efficiency is reduced by right head to body weld		
$I_{\rm III}$ (11(a)(E)(b) is motifar the left head		
UW(11(a)(5)(b) is NOT mot for the body		
UW-11(a)(5)(b) is NOT met for the right head		
Commonts:		
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ASME Sample L-1.5.4 for Main Body Project         Left Head: [Category A] - long seam weld in head, not head to shell weld         Hemispherical       Left head       UW12 Column for this weld a         Seamless       Left head weld type       UW12 Column for this weld a         Seamless       Left head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a         Allowed UW12 Column for this weld a       Circ seam type number 1         Left Circ Weld: [Category A, B, C or D]       UW12 Column for this weld a         Double       Left head to body circ-weld type       UW12 column for this weld a         Full       Body long weld type       UW12 column for this weld a         UW12 column for right circ weld a fadiography       UW12 column for right circ weld a         Long seam filterncy 1       Isolated long seam a         ight circ afficiency 1       Isolated long seam filterncy 1         ight circ afficiency 1       Isolated long seam a         Allowed Circ Efficiency 1       Isolated long seam filterncy 1         ight circ afficiency 0.9       Allowed UW12 Column a         Allowed Circ Efficiency 10.00       Isolated long seam filterncy 10.00         Right head to body circ-weld radiography       UW12 column for this weld a         Long seamless	Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW
Left Head: [Category A] - long seam weld in head, not head to shell weld         Hemispherical       Left head         Seamless       Left head weld type         Seamless       Left head weld radiography         Weld Type Number 0         Isolated long seam efficiency 1.00         Allowed UW12 Column a         Body Long Seam: [Category A]         Double       Body long weld type         Full       Body long weld type         Iet circ efficiency 1       Isolated long seam efficiency 1.00         Allowed Circ Efficiency 1       Isolated long seam efficiency 1.00         Allowed Circ Efficiency 0.90       Allowed UW12 Column a         Allowed Circ Efficiency 0.90       Allowed Long Seam efficiency 1.00         Right Circ Weid: [Category A, B, C or D]       UW12 Column a         Seamless       Right head to body circ-weld type         Full       Right head to body circ-weld type         UW12 Column for finit sweld a       UW12 Column a         Allowed Circ Efficiency 1       UW12 Column for finit sweld a <th>A</th> <th>SME Sample L-1.5.4 for Main Body</th> <th>Project</th>	A	SME Sample L-1.5.4 for Main Body	Project
Hemispherical Seamless Seamless Left head weld type       UW12 Column for this weld a UW12 Column for this weld a Weld Type Number 0 Isolated long seam efficiency 1.00 Allowed UW12 Column a Allowed UW12 Column for this weld a UW12 Column for this weld a UW12 Column for this weld a Circ seam type number 1 Left circ weld efficiency 1.00         Left Circ Weld: [Category A, B, C or D] Double       UW12 Column for this weld a Circ seam type number 1 Left circ weld efficiency 1.00         Body Long Seam: [Category A] Double       UW12 column for this weld a Circ seam type number 1 Left circ weld efficiency 1 Isolated long seam a UW12 column for the body long seam a UW12 column for the tody long seam 1 Isolated long seam Efficiency 1.00 Allowed UW12 Column a Allowed UW12 Column a UW12 column for this weld a UW12 column for the tody long seam tefficiency 1.00 Right Circ Weld: [Category A], B, C or D] Single_W_Backing Right head to body circ-weld type UW12 Column for this weld a UW12 Colum for this weld a UW12 Column for this weld a UW12 Colum	Left Head: [Cate	gory A] - long seam weld in head, no	ot head to shell weld
Seamless Seamless       Left head weld type       UW12 Column for joining acre weld a Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a Allowed UW12 Column a Allowed UW12 Column for this weld a         Edft Circ Weld: [Category A, B, C or D]       UW12 Column for this weld a         Double       Left head to body circ-weld type         Full       Left head to body circ-weld radiography         Body Long Seam: [Category A]       UW12 column for this weld a         Double       Body long weld type         Full       Body long-weld radiography         UW12 column for the body long seam a       UW12 column for the body long seam a         UW12 column for the body long seam a       UW12 column for the body long seam a         UW12 column for the body long seam the file       UW12 column for the body long seam a         UW12 column for the body long seam the file       UW12 column for the body long seam a         Allowed UW12 column for the tork weld a       Long seam type number 1         left circ efficiency 1.0       Allowed UW12 column a         Allowed UW12 column for this weld a       Long seam type number 2         Right thead to body circ-weld type       UW12 column a         Circ seam type number 2       Right head         Seamless       Right head       UW12 Column for this weld a         UW2 Column fo	Hemispherical	Left head	UW12 Column for this weld a
Seamless       Left head weld radiography       Weld Type Number 0         Isolated long seam efficiency       1.00         Allowed UW12 Column a       Allowed UW12 Column for this weld a         Circ Weld:       (Category A, B, C or D)         Double       Left head to body circ-weld type         Full       Left head to body circ-weld type         Body Long Seam:       [Category A]         Body long weld type       UW12 column for the body long seam a         Full       Body long weld type         Ieft circ efficiency 1       Isolated long seam ameticiency 1.00         Allowed Circ Efficiency 1       Isolated long seam ameticiency 1.00         Allowed Circ Efficiency 1       Isolated long seam efficiency 1.00         Allowed Circ Efficiency 0.90       Allowed Long Seam Efficiency 1.00         Allowed Circ Efficiency 0.90       Allowed Long Seam Efficiency 1.00         Right Circ Weld:       [Category A, B, C or D]         Single_W Backing       Right head to body circ-weld radiography       UW12 Column a         Full       Right head to body circ-weld radiography       Circ seam type number 2         Right head:       ICategory A] - long seam weld in head, not head to bell weld       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0       Isolated	Seamless	Left head weld type	UW12 Column for joining circ weld <b>a</b>
Isolated long seam efficiency 1.00 Allowed UW12 Column a Altowed Head Efficiency 1.00 Duble Left head to body circ-weld type Full Left head to body circ-weld radiography Double Body long weld type Full Body long weld type UW12 column for this weld a Circ seam type number 1 Left circ weld efficiency 1 Isolated long seam a UW12 column for right circ weld a Long seam tifcency 1 Isolated long seam efficiency 1.00 Right Circ Weld: [Category A, B, C or D] Single_W_Backing Right head to body circ-weld type Full Right head to body circ-weld type Weld Zolumn a Allowed UW12 column a Circ seam type number 2 Right circ weld efficiency [0.90 Right Circ Weld: [Category A, B, C or D] Single_W_Backing Right head to body circ-weld type Weld Column for this weld a UW12 column for this weld a UW12 column for this weld a UW12 column for this weld a Circ seam type number 2 Right circ weld efficiency [0.90 Right Head: [Category A] - long seam weld in head, not head to shell weld Seamless Right head weld type Weld Type Number 0 Isolated long seam efficiency 1.00 Allowed UW12 Column a Allowed UW12 Column a Allowed UW12 Column for this weld a UW12 Column	Seamless	Left head weld <b>radiography</b>	Weld Type Number 0
Allowed UW12 Column a         Allowed Head Efficiency 1.00         Double       Left head to body circ-weld type         Full       Left head to body circ-weld radiography         Circ seam type number 1         Left circ Weld: [Category A]         Double       Body Long Seam: [Category A]         Double       Body long weld type         Full       Body long weld type         Body long weld radiography       UW12 column for the body long seam a         UW12 column for the circ weld a       UW12 column for the circ weld a         UW12 column for the circ weld a       UW12 column for the circ weld a         Long seam type number 1       Isolated long seam afficiency 1.00         Allowed Long Seam Efficiency [0.90       Allowed Long Seam Efficiency [.00         Right Circ Weld: [Category A, B, C or D]       UW12 column for the tore provide type         Full       Right head to body circ-weld radiography       UW12 column a         Right Circ Weld: [Category A] - Long seam weld in head, not head to shell weld       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a         UW12 Column for the add weld type       UW12 Column for this weld a       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a       UW12			Isolated long seam efficiency <b>1.00</b>
Allowed Head Efficiency 1.00         Left Circ Weld: [Category A, B, C or D]         Double       Left head to body circ-weld type         Full       Left head to body circ-weld radiography         Body Long Seam: [Category A]       UW12 Column for this weld a         Double       Body long weld type         Full       Body long-weld radiography         UW12 column for the body long seam a       UW12 column for left circ weld a         UW12 column for left circ weld a       UW12 column for left circ weld a         Long seam type number 1       Long seam type number 1         Lot column for left circ weld a       UW12 column for left circ weld a         UW12 column for left circ weld a       UW12 column for left circ weld a         Long seam type number 1       Long seam type number 1         Lot column for left circ weld a       UW12 column for left circ weld a         Milowed Circ Efficiency 0.9       Allowed Long Seam Efficiency 1.00         Right head to body circ-weld type       UW12 Column a         Full       Right head       UW12 Column for left weld a         Seamless       Right head weld type       UW12 Column for left circ weld a         Seamless       Right head weld type       UW12 Column for left circ weld a         Seamless       Right head weld type       UW12 Column for left circ weld			Allowed UW12 Column a
Left Circ Weld: [Category A, B, C or D]       UW12 Column for this weld a         Full       Left head to body circ-weld radiography       UW12 Column for this weld a         Circ seam type number 1       Left circ weld efficiency 1.00         Body Long Seam: [Category A]       UW12 column for the body long seam a         Full       Body long-weld radiography       UW12 column for the body long seam a         UW12 column for left circ weld a       Long seam type number 1         Left circ efficiency 1       Isolated long seam efficiency 1.00         Allowed Circ Efficiency 0.9       Allowed Long Seam efficiency 1.00         Right Circ Weld: [Category A, B, C or D]       UW12 Column a         Single_W Backing       Right head to body circ-weld radiography       UW12 Column a         Full       Right head to body circ-weld radiography       UW12 Column a         Single_W Backing       Right head to body circ-weld radiography       UW12 Column a         Seamless       Right head weld type       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a         UW12 Column for this weld a       UW12 Column for this weld a       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a       UW12 Column for this weld a         UW12 Column for this weld a<			Allowed Head Efficiency 1.00
Double Full       Left head to body circ-weld type       UW12 column for this weld a Circ seam type number 1         Body Long Seam: [Category A]       UW12 column for the body long seam a         Double       Body long weld type       UW12 column for the body long seam a         Full       Body long-weld radiography       UW12 column for the body long seam a         UW12 column for the torweld a       UW12 column for the body long seam a         Jouble       Body long-weld radiography       UW12 column for the body long seam a         UW12 column for the body long seam a       UW12 column for the body long seam a         Jouble       Body long-weld radiography       UW12 column for the body long seam a         UW12 column for right circ weld a       Long seam type number 1         Isolated long seam efficiency [0.90       Allowed Long Seam Efficiency [1.00         Right Circ Weld: [Category A, B, C or D]       UW12 column for this weld a         Single_W Backing       Right head to body circ-weld radiography       UW12 column for this weld a         Seamless       Right head weld type       UW12 column for this weld a         Seamless       Right head weld radiography       UW12 column for this weld a         UW12 Column for this weld a       UW12 column for this weld a       UW12 column for this weld a         Seamless       Right head weld tradiography       UW12 co	Left Circ Weld: [	Category A, B, C or D]	
Full       Left thead to body Circ-weld radiography       Circ seam type number 1         Left circ weld efficiency       1.00         Body Long Seam: [Category A]       UW12 column for the body long seam a         Full       Body long-weld type         Full       Body long-weld radiography         UW12 column for the body long seam a       UW12 column for left circ weld a         Long seam type number 1       Long seam type number 1         left circ efficiency 0.9       Allowed UW12 Column a         Allowed Circ Efficiency 0.9       Allowed UW12 Column a         Allowed Circ Efficiency 0.90       Allowed UW12 Column a         Right Circ Weld: [Category A, B, C or D]       UW12 column for this weld a         Single_W_Backing       Right head to body circ-weld radiography       UW12 Column a         Right Head: [Category A] - long seam weld in head, not head to shell weld       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for joining circ weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a       Allowed Head Efficiency 1.00         Notes:       UW-11(a)(5)(b) is met for the left head       UW+11(a)(5)(b) is met for the left head       UW+11(a)(5)(b) is met for the right head         UW+11(a)	Double	Left head to body circ-weld type	UW12 Column for this weld a
Body Long Seam: [Category A]         Double       Body long weld type         Full       Body long-weld radiography         UW12 column for the body long seam a         Image: Column for the body long seam and the body long seam type number 1         Image: Column for the body long seam type number 1         Image: Column for the long seam type number 1         Image: Column for the long seam type number 1         Image: Column for the long seam type number 2         Right Circ Weld: [Category A, B, C or D]         Single: W_Backing         Right head to body circ-weld type         UW12 Column for this weld a         Seamless         Right head         Seamless         Right head weld type         Seamless         Right head weld type         UW12 Column for this weld a         UW12 Column for this weld a         Mowed UW12 Column for this weld a         UW12 Column for this weld a         UW12 Column for this weld a </th <th>Full</th> <th>Left head to body circ-weld radiograp</th> <th>hy Circ seam type number 1</th>	Full	Left head to body circ-weld radiograp	hy Circ seam type number 1
Body Long Seam: [Category A]       UW12 column for the body long seam a         Full       Body long-weld radiography       UW12 column for the body long seam a         UW12 column for right circ weld a       UW12 column for right circ weld a         UW12 column for right circ weld a       UW12 column for right circ weld a         UW12 column for right circ weld a       UW12 column for right circ weld a         Isolated long seam tifticiency 1.00       Allowed UW12 column a         Allowed Circ Efficiency [0.90       Allowed Long Seam Efficiency [1.00]         Right Circ Weld: [Category A, B, C or D]       UW12 column for right circ weld a ficiency [0.90]         Single W_Backing       Right head to body circ-weld type       UW12 column for right circ weld a         Full       Right head to body circ-weld radiography       UW12 column for right circ weld a         Semi-Elliptical       Right head weld type       UW12 column for right circ weld a         Seamless       Right head weld radiography       UW12 column for right circ weld a         UW-11(a)(5)(b) is met for the left head       UW12 column for right circ weld a         UW-11(a)(5)(b) is met for the left head       UW12 column for right circ weld a         UW-11(a)(5)(b) is met for the left head       UW12 column for right circ weld a         UW-11(a)(5)(b) is met for the left head       UW12 column for right circ weld a <td< th=""><th></th><th></th><th>Left circ weld efficiency <b>1.00</b></th></td<>			Left circ weld efficiency <b>1.00</b>
Double       Body long weld type       UW12 column for the body long seam a         Full       Body long-weld radiography       UW12 column for the body long seam a         UW12 column for right circ weld a       UW12 column for right circ weld a         Long seam type number 1       Isolated long seam efficiency 1.00         right circ efficiency 0.9       Allowed UW12 Column a         Allowed Circ Efficiency [0.90       Allowed UW12 Column a         Right Circ Weld: [Category A, B, C or D]       UW12 column for this weld a         Single_W_Backing       Right head to body circ-weld radiography       UW12 Column a         Right head to body circ-weld radiography       Circ seam type number 2       Right circ weld efficiency 0.90         Right Head: [Category A] - long seam weld in head, not head to shell weld       UW12 Column for this weld a       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0       Isolated long seam efficiency 1.00         Notes:       UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         <	Body Long Sean	n: [Category A]	
Full       Body long-weld radiography       UW12 column for left circ weld a         UW12 column for right circ weld a       UW12 column for right circ weld a         Long seam type number 1       Isolated long seam efficiency 1.00         Right Circ Weld:       [Category A, B, C or D]         Single_W_Backing       Right head to body circ-weld type         Full       Right head to body circ-weld radiography         Right Circ Weld:       [Category A, B, C or D]         Single_W_Backing       Right head to body circ-weld radiography         Right flead:       [Category A] - long seam weld in head, not head to shell weld         Seamless       Right head         Bight head weld type       UW12 Column for right circ weld a         UW12 Column for right circ weld a       UW12 Column a         Allowed UW12 Column a       Circ seam type number 2         Right head       UW12 Column for right field         Seamless       Right head weld type         Weld Type Number 0       Isolated long seam efficiency 1.00         Allowed UW12 Column a       Allowed UW12 Column a         UW-11(a)(5)(b) is met for the left head	Double	Body long weld type	UW12 column for the body long seam a
UW12 column for right circ weld a         Long seam type number 1         Isolated long seam efficiency 0.9         Allowed UW12 Column a         Allowed Circ Efficiency 0.9         Allowed Long Seam Efficiency 1.00         Right Circ Weld: [Category A, B, C or D]         Single W_Backing         Right head to body circ-weld type         Full         Right head to body circ-weld radiography         Circ seam type number 2         Right circ weld efficiency 0.90         Right head: [Category A] - long seam weld in head, not head to shell weld         Seemiess       Right head weld type         W12 Column for ribing circ weld a         Seamless       Right head weld type         Right head weld radiography       W12 Column for ribing circ weld a         Seamless       Right head weld radiography         Weld Type Number 0       Isolated long seam efficiency 1.00         Allowed UW12 Column a       Allowed UW12 Column a         Allowed UW12 Column a       Allowed UW12 Column a         Might head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a         Allowed UW12 Column a       Allowed UW12 Column a         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the rig	Full	Body long-weld radiography	UW12 column for left circ weld a
Long seam type number 1         Isolated long seam efficiency 1.00         right circ efficiency 0.9       Allowed UW12 Column a         Allowed Circ Efficiency [0.90       Allowed Long Seam Efficiency 1.00         Right Circ Weld: [Category A, B, C or D]       UW12 Column a         Single W Backing       Right head to body circ-weld type       UW12 Column a         Full       Right head to body circ-weld radiography       Circ seam type number 2         Right Head: [Category A] - long seam weld in head, not head to shell weld       UW12 Column for this weld a         Semi-Elliptical       Right head weld type       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a       Allowed UW12 Column a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a       Allowed UW12 Column a         Allowed UW12 Column a       Allowed UW12 Column a       Isolated long seam efficiency 1.00         Notes:       UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the isody       Isolated long seam efficiency 1.00         UW-11(a)(5)(b) is met for the isody       UW-11(a)(5)(b) is met for the isody       Isolate column ison isolate column isolate       Isola			UW12 column for right circ weld <b>a</b>
left circ efficiency 1       Isolated long seam efficiency 1.00         right circ efficiency 0.9       Allowed UW12 Column a         Allowed Circ Efficiency 0.90       Allowed Long Seam Efficiency 1.00         Right Circ Weld: [Category A, B, C or D]       Single_W_Backing         Right head to body circ-weld radiography       UW12 Column a         Full       Right head to body circ-weld radiography       Circ seam type number 2         Right Head: [Category A] - long seam weld in head, not head to shell weld       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column for this weld a       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0       Isolated long seam efficiency 1.00         Allowed UW12 Column a       Allowed UW12 Column a       Allowed UW12 Column a         Mowed Efficiency       1.00       Allowed UW12 Column a         VW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the inght head       Empirical         UW-11(a)(5)(b) is met for the left head			Long seam type number 1
Allowed Circ Efficiency 0.90         Allowed Long Seam Efficiency 1.00         Right Circ Weld: [Category A, B, C or D]         Single_W_Backing         Right head to body circ-weld type       UW12 Column a         Full       Right head to body circ-weld radiography       Circ seam type number 2         Right Head: [Category A] - long seam weld in head, not head to shell weld       0.90         Right Head: [Category A] - long seam weld in head, not head to shell weld       UW12 Column for this weld a         Semi-Elliptical       Right head       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for joining circ weld a         Seamless       Right head weld radiography       UW12 Column for joining circ weld a         Mlowed UW12 Column a       Allowed UW12 Column a       1.00         Allowed UW12 Column a       Allowed UW12 Column a       1.00         Notes:       UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the body       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the pody       UW-11(a)(5)(b) is met for the pody         UW-11(a)(5)(b) is met for the pody       UW-11(a)(5)(b) is met for the pody       This sheet is for educational use only. Only ASME can make code interpretations. <th></th> <th>left circ efficiency 1</th> <th>Isolated long seam efficiency 1.00</th>		left circ efficiency 1	Isolated long seam efficiency 1.00
Allowed Circ Efficiency [0.90       Allowed Long Seam Efficiency [1.00         Right Circ Weld: [Category A, B, C or D]       UW12 Column a         Full       Right head to body circ-weld type       UW12 Column a         Full       Right head to body circ-weld radiography       Circ seam type number 2         Right Head: [Category A] - long seam weld in head, not head to shell weld       0.90         Right Head: [Category A] - long seam weld in head, not head to shell weld       UW12 Column for this weld a         Semi-Elliptical       Right head       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for joining circ weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a       Allowed UW12 Column a         Allowed UW12 Column for joining circ weld a       UW12 Column for joining circ weld a       UW12 Column for joining circ weld a         Notes:       Isolated long seam efficiency 1.00       Allowed Head Efficiency 1.00       Allowed W12 Column a         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the body       UW-11(a)(5)(b) is met for the type head         Comments:       This sheet is for educational use only. Only ASME can make code interpretations.       Encineering 1 td		right circ efficiency 0.9	Allowed UW12 Column a
Right Circ Weld: [Category A, B, C or D]         Single_W_Backing Full       Right head to body circ-weld type       UW12 Column a         Circ seam type number 2       Right circ weld efficiency 0.90         Right Head: [Category A] - long seam weld in head, not head to shell weld       Semi-Elliptical         Right head       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a         Right head weld type       UW12 Column for this weld a       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a         Allowed UW12 Column a       Allowed Head Efficiency 1.00         Notes:       Isolated long seam efficiency 1.00         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the right head         Comments:       This sheet is for educational use only. Only ASME can make code interpretations.		Allowed Circ Efficiency 0.90	Allowed Long Seam Efficiency 1.00
Single_W_Backing Full       Right head to body circ-weld type       UW12 Column a         Right head to body circ-weld radiography       Circ seam type number 2         Right circ weld efficiency       0.90         Right head:       [Category A] - long seam weld in head, not head to shell weld         Semi-Elliptical       Right head       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a         Allowed Head Efficiency       1.00         Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the right head         UW-11(a)(5)(b) is met for the right head       Comments:         This sheet is for educational use only. Only ASME can make code interpretations.	Right Circ Weld:	[Category A, B, C or D]	
Full       Right head to body circ-weld radiography       Circ seam type number 2         Right circ weld efficiency       0.90         Right Head:       [Category A] - long seam weld in head, not head to shell weld         Semi-Elliptical       Right head       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for this weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency       1.00         Allowed UW12 Column a       Allowed UW12 Column a         Allowed Head Efficiency       1.00         Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the right head       Comments:         This sheet is for educational use only. Only ASME can make code interpretations.	Single_W_Backing	Right head to body circ-weld type	UW12 Column a
Right Line weld efficiency       0.90         Right Head: [Category A] - long seam weld in head, not head to shell weld         Semi-Elliptical       Right head         Bight head weld type       UW12 Column for this weld a         Seamless       Right head weld radiography         Weld Type Number 0       Isolated long seam efficiency 1.00         Allowed UW12 Column a       Allowed UW12 Column a         Allowed Head Efficiency       1.00         Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the right head         Comments:       This sheet is for educational use only. Only ASME can make code interpretations.	Full	Right head to body circ-weld radiogra	phy Circ seam type number 2
Right Head: [Category A] - long seam weld in head, not head to shell weld         Semi-Elliptical       Right head       UW12 Column for this weld a         Seamless       Right head weld type       UW12 Column for joining circ weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency       1.00         Allowed UW12 Column a       Allowed UW12 Column a         Allowed Head Efficiency       1.00         Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the left head         Descure Vassel Engineering I tel       Itel			Right circ weld efficiency 0.90
Semi-Elliptical Seamless       Right head weld type Right head weld radiography       UW12 Column for this weld a UW12 Column for joining circ weld a Weld Type Number 0 Isolated long seam efficiency 1.00 Allowed UW12 Column a Allowed Head Efficiency 1.00         Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the right head         Comments:         This sheet is for educational use only. Only ASME can make code interpretations.	Right Head: [Cat	egory A] - long seam weld in head, r	not head to shell weld
Seamless       Right head weld type       UW12 Column for joining circ weld a         Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a         Allowed Head Efficiency       1.00         Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the body         UW-11(a)(5)(b) is met for the right head       UW-11(a)(5)(b) is met for the right head         Comments:       This sheet is for educational use only. Only ASME can make code interpretations.	Semi-Elliptical	Right head	UW12 Column for this weld a
Seamless       Right head weld radiography       Weld Type Number 0         Isolated long seam efficiency 1.00       Allowed UW12 Column a         Allowed Head Efficiency       1.00         Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       UW-11(a)(5)(b) is met for the body         UW-11(a)(5)(b) is met for the right head       UW-11(a)(5)(b) is met for the right head         Comments:       This sheet is for educational use only. Only ASME can make code interpretations.	Seamless	Right head weld type	UW12 Column for joining circ weld <b>a</b>
Isolated long seam efficiency 1.00         Allowed UW12 Column a         Allowed Head Efficiency 1.00         Notes:         UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the body         UW-11(a)(5)(b) is met for the right head         Comments:         This sheet is for educational use only. Only ASME can make code interpretations.	Seamless	Right head weld radiography	Weld Type Number 0
Allowed UW12 Column a Allowed Head Efficiency 1.00 Notes: UW-11(a)(5)(b) is met for the left head UW-11(a)(5)(b) is met for the body UW-11(a)(5)(b) is met for the right head Comments: This sheet is for educational use only. Only ASME can make code interpretations.			Isolated long seam efficiency 1.00
Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       Image: Comments is the is for educational use only. Only ASME can make code interpretations.			Allowed UW12 Column a
Notes:       Sketch:         UW-11(a)(5)(b) is met for the left head       Image: Comments:         UW-11(a)(5)(b) is met for the right head       Image: Comments:         This sheet is for educational use only. Only ASME can make code interpretations.       Image: Comments:         Pressure Vessel Engineering Ltd       Image: Comments:			Allowed Head Efficiency 1.00
UW-11(a)(5)(b) is met for the left head UW-11(a)(5)(b) is met for the body UW-11(a)(5)(b) is met for the right head Comments: This sheet is for educational use only. Only ASME can make code interpretations.	Notes:		Sketch:
UW-11(a)(5)(b) is met for the left head         UW-11(a)(5)(b) is met for the body         UW-11(a)(5)(b) is met for the right head         Comments:         This sheet is for educational use only. Only ASME can make code interpretations.         Pressure Vessel Engineering 1 td			
UW-11(a)(5)(b) is met for the body         UW-11(a)(5)(b) is met for the right head         Comments:         This sheet is for educational use only. Only ASME can make code interpretations.         Pressure Vessel Engineering Ltd	UW-11(a)(5)(b) is met	for the left head	
Comments: This sheet is for educational use only. Only ASME can make code interpretations. Pressure Vessel Engineering Ltd	UW-11(a)(5)(b) is met	for the body	
Comments: This sheet is for educational use only. Only ASME can make code interpretations. Pressure Vessel Engineering Ltd	UW-11(a)(5)(b) is met	tor the right head	
Pressure Vessel Engineering 1 td	Comments:	etieneluse entre Ontre ASME een meles eede in	
Pressure Vessel Engineering 1 td	i his sheet is for educa	ational use only. Only ASME can make code int	
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Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW
	ASME Sample L-1.5.4 for Sump	Project
Left Head: [Cate	gory A] - long seam weld in head, no	t head to shell weld
Corner	Left head	UW12 Column for this weld a
Corner	Left head weld type	UW12 Column for joining circ weld a
None	Left head weld radiography	Weld Type Number 7
		Isolated long seam efficiency 1.00
		Allowed UW 12 Column a
		Anowed <b>nead Enciency</b> 1.00
Left Circ weid: [	Lategory A, B, C or Dj	1.11440 Octomer for this world -
Nono	Left head to body circ-weld radiograp	Circ accorn time number 7
None	Left field to body circ-weid radiograp	Loft circ wold officionau 1 00
Padu Lang Saan	e Cotogon Al	
Soomloss	Body long weld type	111/12 solume for the body long scom
Seamless	Body long-weld radiography	LIM/12 column for left circ weld
Ocanness	body long weld radiography	LIW12 column for right circ weld
		Long seam type number
	left circ efficiency 1	Isolated long seam efficiency 1.00
	right circ efficiency 0.9	Allowed UW12 Column a
	Allowed Circ Efficiency 0.90	Allowed Long Seam Efficiency 1.00
<b>Right Circ Weld:</b>	[Category A. B. C or D]	
Single_W_Backing	Right head to body circ-weld type	UW12 Column a
Full	Right head to body circ-weld radiogra	phy Circ seam type number 2
		Right circ weld efficiency 0.90
Right Head: [Cat	egory A] - long seam weld in head, r	ot head to shell weld
F&D	Right head	UW12 Column for this weld a
Seamless	Right head <b>weld type</b>	UW12 Column for joining circ weld a
Seamless	Right head weld <b>radiography</b>	Weld Type Number 0
		Isolated long seam efficiency <b>1.00</b>
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Notes:		Sketch:
UW-11(a)(5)(b) is met	for the left head	
UW-11(a)(5)(b) is met	for the right hand	<b>↓</b>
Comments:	ational use only. Only ASME can make code int	erpretations
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Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW
A	SME Sample L-1.5.5 for Main Body	Project
Left Head: [Cate	gory A] - long seam weld in head, no	ot head to shell weld
Hemispherical	Left head	UW12 Column for this weld a
Seamless	Left head weld type	UW12 Column for joining circ weld <b>a</b>
Seamless	Left head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW12 Column a
Left Circ Weld: [	Lategory A, B, C or Dj	
Double	Left head to body circ-weid type	UW12 Column for this weld a
Fuii	Left field to body circ-weid radiograp	Loft aire weld officioner 1
Body Long Sean	n: [Category A]	
Double	Body long weld redie grouphy	UW12 column for the body long seam a
Fuil	Body long-weid radiography	UW12 column for left circ weld a
		UW12 column for right circ weld b
	loft aire officianay 1	Long seam type number 1
	right circ efficiency	Allowed LIM/12 Column
	Allowed Circ Efficiency 0.80	Allowed Long Seam Efficiency 1 00
Dight Circ Wold		
Single W Backing	Pight head to hady size wold type	LIM/42 Column b
Single_W_Backing	Pight head to body circ-weld radiogra	nhy Circ coom type number 2
Spor	Right head to body circ-weid radiogra	Right circ weld efficiency 0.80
District Lands (Cat	anow Al lower access would in based a	
Somi-Elliptical	egory Aj - long seam weid in nead, r	INVIO Column for this wold
Seamless	Right head weld type	LIW12 Column for joining circ wold
Seamless	Right head weld radiography	Weld Type Number
<u> </u>	right hour word rudiography	Isolated long seam efficiency 1 00
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Notes:		Sketch:
UW-11(a)(5)(b) is met	for the left head	
UW-11(a)(5)(b) is met	for the body	
UW-11(a)(5)(b) is met	for the right head	
Comments:		
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<b>Vessel We</b>	Id Efficiency ver 1.00	ASME VIII-1 Section UW
	ASME Sample L-1.5.5 for Sump F	Project
Left Head: [Cate	gory A] - long seam weld in head, no	t head to shell weld
Corner	Left head	UW12 Column for this weld a
Corner	Left head weld type	UW12 Column for joining circ weld a
None	Left head weld radiography	Weld Type Number 7
		Isolated long seam efficiency <b>1.00</b>
		Allowed UW12 Column a
		Allowed Head Elitclency 1.00
Left Circ Weid: [	Lategory A, B, C or DJ	1111/12 Column for this would a
Nono	Left head to body circ-weld type	
None	Left field to body circ-weid radiograph	Loft circ wold officioney 1.00
Padu Lang Saan	e Cotogon Al	
Soomloss	Rody long weld type	LIM/12 column for the body long poom
Seamless	Body long-weld radiography	LIW12 column for left circ weld
Ocanness	body long weld radiography	LIW12 column for right circ weld b
		l ong seam type number
	left circ efficiency 1	Isolated long seam efficiency 1.00
	right circ efficiency <b>0.8</b>	Allowed UW12 Column a
	Allowed Circ Efficiency 0.80	Allowed Long Seam Efficiency 1.00
<b>Right Circ Weld:</b>	[Category A. B. C or D]	·
Single W Backing	Right head to body circ-weld type	UW12 Column b
Spot	Right head to body circ-weld radiogra	Circ seam type number 2
		Right circ weld efficiency 0.80
Right Head: [Cat	egory A] - long seam weld in head, n	ot head to shell weld
F&D	Right head	UW12 Column for this weld a
Seamless	Right head <b>weld type</b>	UW12 Column for joining circ weld b
Seamless	Right head weld <b>radiography</b>	Weld Type Number 0
		Isolated long seam efficiency <b>1.00</b>
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Notes:	5	Sketch:
		[ <mark>-</mark> ]
	for the left hand	
UW-11(a)(5)(b) is met	for the body	
UW-11(a)(5)(b) is met	for the right head	
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<b>Vessel We</b>	Id Efficiency ver 1.00	ASME VIII-1 Section UW
A	SME Sample L-1.5.6 for Main Body F	Project
Left Head: [Cate	gory A] - long seam weld in head, no	t head to shell weld
Hemispherical	Left head	UW12 Column for this weld a
Seamless	Left head weld type	UW12 Column for joining circ weld <b>b</b>
Seamless	Left head weld radiography	Weld Type Number 0
		Isolated long seam efficiency <b>1.00</b>
		Allowed UW12 Column b
		Allowed Head Efficiency 0.85
Left Circ Weld: [	Category A, B, C or D]	
Double	Left head to body circ-weld type	UW12 Column for this weld b
Spot	Left head to body circ-weld radiograp	hy Circ seam type number 1
		Left circ weld efficiency 0.85
Body Long Sean	n: [Category A]	
Double	Body long weld type	UW12 column for the body long seam <b>b</b>
Spot	Body long-weld radiography	UW12 column for left circ weld <b>b</b>
		UW12 column for right circ weld <b>b</b>
		Long seam type number 1
	left circ efficiency 0.85	Isolated long seam efficiency 0.85
	right circ efficiency 0.8	Allowed UW12 Column b
	Allowed Circ Efficiency 0.80	Allowed Long Seam Efficiency 0.85
Right Circ Weld:	[Category A, B, C or D]	
Single_W_Backing	Right head to body circ-weld type	UW12 Column b
Spot	Right head to body circ-weid radiogra	pny Circ seam type number 2
		Right circ weld efficiency <b>0.80</b>
Right Head: [Cat	egory A] - long seam weld in head, n	ot head to shell weld
Semi-Elliptical	Right head	UW12 Column for this weld a
Seamless	Right head weld type	UW12 Column for joining circ weld b
Seamless	Right head weld radiography	Weld Type Number 0
		Isolated long seam efficiency 1.00
		Allowed UW 12 Column a
		Allowed <b>Head Efficiency</b> 1.00
Notes:		Sketch:
Left head efficiency is	reduced by left circ-weld efficiency	
	T mot for the left head	
UW = 11(a)(5)(b) is NO	T met for the body	
UW-11(a)(5)(b) is not	for the right head	ł
	for the light hour	
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Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW
	ASME Sample L-1.5.6 for Sump F	Project
Left Head: [Cate	gory A] - long seam weld in head, no	t head to shell weld
Corner	Left head	UW12 Column for this weld a
Corner	Left head weld type	UW12 Column for joining circ weld a
None	Left head weld radiography	Weld Type Number 7
		Isolated long seam efficiency <b>1.00</b>
		Allowed UW12 Column a
		Allowed Head Elitclency 1.00
Left Circ Weld: [	Lategory A, B, C or Dj	
Nono	Left head to body circ-weld type	
None	Left field to body circ-weid radiograph	Loft circ wold officioney 1.00
Padul ang Saan	e Cotogon Al	
Soamloss	Rody long weld type	LIM/12 column for the body long poom
Seamless	Body long-weld radiography	LIW12 column for left circ weld
Ocamicos	body long weld radiography	LIW12 column for right circ weld b
		l ong seam type number
	left circ efficiency 1	Isolated long seam efficiency 1.00
	right circ efficiency <b>0.8</b>	Allowed UW12 Column a
	Allowed Circ Efficiency 0.80	Allowed Long Seam Efficiency 1.00
<b>Right Circ Weld:</b>	[Category A. B. C or D]	·
Single W Backing	Right head to body circ-weld type	UW12 Column b
Spot	Right head to body circ-weld radiogra	Circ seam type number 2
		Right circ weld efficiency 0.80
Right Head: [Cat	egory A] - long seam weld in head, n	ot head to shell weld
F&D	Right head	UW12 Column for this weld a
Seamless	Right head <b>weld type</b>	UW12 Column for joining circ weld b
Seamless	Right head weld <b>radiography</b>	Weld Type Number 0
		Isolated long seam efficiency <b>1.00</b>
		Allowed UW12 Column a
		Allowed Head Efficiency 1.00
Notes:	5	Sketch:
		[ <mark>-</mark> ]
	for the left hand	
UW-11(a)(5)(b) is met	for the body	
UW-11(a)(5)(b) is met	for the right head	
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Vessel We	Id Efficiency ver 1.00	ASME VIII-1 Section UW	
	ASME Sample L-1.6.1(a)	Project	
Left Head: [Cate	gory A] - long seam weld in head, n	ot head to shell weld	
Flat	Left <b>head</b>	UW12 Column for this weld a	
Seamless	Left head <b>weld type</b>	UW12 Column for joining circ weld a	
Seamless	Left head weld <b>radiography</b>	Weld Type Number 0	
		Isolated long seam efficiency <b>1.00</b>	
		Allowed UW12 Column a	
		Allowed Head Efficiency 1.00	
Left Circ Weld: [	Category A, B, C or D]		
Corner	Left head to body circ-weld type	UW12 Column for this weld a	
None	Left head to body circ-weld radiogram	Circ seam type number 7	
		Left circ weld efficiency <b>1.00</b>	
<b>Body Long Sean</b>	n: [Category A]		
Seamless	Body long <b>weld type</b>	UW12 column for the body long seam a	
Seamless	Body long-weld radiography	UW12 column for left circ weld a	
		UW12 column for right circ weld c	
		Long seam type number 0	
	left circ efficiency 1	Isolated long seam efficiency 1.00	
	right circ efficiency 0.7	Allowed UW12 Column b	
	Allowed Circ Efficiency 0.70	Allowed Long Seam Efficiency 0.85	
<b>Right Circ Weld:</b>	[Category A, B, C or D]		
Double	Right head to body circ-weld type	UW12 Column c	
None	Right head to body circ-weld radiogra	Circ seam type number 1	
		Right circ weld efficiency <b>0.70</b>	
Right Head: [Cat	egory A] - long seam weld in head,	not head to shell weld	
Semi-Elliptical	Right <b>head</b>	UW12 Column for this weld a	
Seamless	Right head <b>weld type</b>	UW12 Column for joining circ weld c	
Seamless	Right head weld <b>radiography</b>	Weld Type Number 0	
		Isolated long seam efficiency 1.00	
		Allowed UW12 Column b	
		Allowed Head Efficiency 0.85	
Notes:		Sketch:	
Body efficiency is redu	uced by head to body welds		
		<b>₩</b>	
Right head efficiency	is reduced by right head to body weld		
UW-11(a)(5)(b) is met for the left head			
UW-11(a)(5)(b) is NOT met for the body			
UW-11(a)(5)(b) IS NO	I met for the right head		
Comments:	tional was and a Only ACME can make and in		
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<b>Vessel We</b>	Id Efficiency ver 1.00	ASME VIII-1 Section UW	
	ASME Sample L-1.6.1(b)	Project	
Left Head: [Cate	gory A] - long seam weld in head, no	t head to shell weld	
Flat	Left <b>head</b>	UW12 Column for this weld a	
Seamless	Left head <b>weld type</b>	UW12 Column for joining circ weld a	
Seamless	Left head weld radiography	Weld Type Number 0	
		Isolated long seam efficiency 1.00	
		Allowed UW12 Column a	
		Allowed Head Efficiency 1.00	
Left Circ Weld: [	Category A, B, C or D]		
Corner	Left head to body circ-weld type	UW12 Column for this weld a	
None	Left head to body circ-weld radiograp	hy Circ seam type number 7	
		Left circ weld efficiency <b>1.00</b>	
Body Long Sean	n: [Category A]		
Seamless	Body long weld type	UW12 column for the body long seam a	
Seamless	Body long-weld radiography	UW12 column for left circ weld a	
	, , , , , , , , , , , , , , , , , , ,	UW12 column for right circ weld b	
		Long seam type number 0	
	left circ efficiency 1	Isolated long seam efficiency 1 00	
	right circ efficiency 0.85	Allowed LIW12 Column a	
	Allowed Circ Efficiency 0.85	Allowed Long Seam Efficiency 1.00	
<b>Bight Circ Wold:</b>			
Right Circ Weld.	Pight head to heav size weld type	LIM/42 Column b	
Double	Right head to body circ-weld type		
Эрог	Right head to body circ-weid radiogra	Direct search type humber	
		Right circ weid eniciency 0.00	
Right Head: [Cat	egory AJ - long seam weld in head, n	ot head to shell weld	
Semi-Elliptical	Right head	UW12 Column for this weld a	
Seamless	Right head weid type	UW12 Column for joining circ weld b	
Seamless	Right head weld radiography	Weld Type Number 0	
		Isolated long seam efficiency <b>1.00</b>	
		Allowed UW12 Column a	
		Allowed Head Efficiency 1.00	
Notes:	5	Sketch:	
UW-11(a)(5)(b) is met	for the left head		
UW-11(a)(5)(b) is met for the body			
UW-11(a)(5)(b) is met	for the right head		
Comments:			
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Vessel Weld Efficiency ver 1.00	ASME VIII-1 Section UW		
ASME Sample L-1.6.2	Project		
Left Head: [Category A] - long seam weld in head, n	ot head to shell weld		
Flat Left head	UW12 Column for this weld a		
Seamless Left head weld type	UW12 Column for joining circ weld a		
Seamless Left head weld radiography	Weld Type Number 0		
	Isolated long seam efficiency 1.00		
	Allowed UW12 Column a		
	Allowed Head Efficiency 1.00		
Left Circ Weld: [Category A, B, C or D]			
Corner Left head to body circ-weld type	UW12 Column for this weld a		
None Left head to body circ-weld radiogra	Circ seam type number 7		
	Left circ weld efficiency <b>1.00</b>		
Body Long Seam: [Category A]			
Seamless Body long weld type	UW12 column for the body long seam a		
Seamless Body long-weld radiography	UW12 column for left circ weld a		
	UW12 column for right circ weld a		
	Long seam type number 0		
left circ efficiency 1	Isolated long seam efficiency <b>1.00</b>		
right circ efficiency 1	Allowed UW12 Column		
Allowed Circ Efficiency 1.00	Allowed Long Seam Efficiency 1.00		
Right Circ Weld: [Category A B C or D]			
<b>Corner</b> Right head to body circ-weld type	LIW12 Column		
None Right head to body circ-weld radiogr	anhy Circ seam type number 7		
	Right circ weld efficiency <b>1</b> 00		
Disht Hand Kataram Al Janu anam weld in hand			
Right Head: [Category A] - long seam weld in head,			
Flat Right head weld ture	UW12 Column for this weld a		
Seamless Right head weld rediegree by	UW 12 Column for joining circ weld a		
Seamless Right head weld radiography	Weld Type Number		
	Isolated long seam efficiency 1.00		
	Allowed UW12 Column a		
	Allowed Head Efficiency 1.00		
Notes:	Sketch:		
	· · · · · · · · · · · · · · · · · · ·		
UW-11(a)(5)(b) is met for the left head			
UW-11(a)(5)(b) is met for the body	ЦЦ		
UW-11(a)(5)(b) is met for the right head			
Comments:			
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Vessel Weld Efficiency ver 1.00	ASME VIII-1 Section UW			
ASME Sample L-1.6.3 Project				
Left Head: [Category A] - long seam weld in head, no	ot head to shell weld			
Flat Left head	UW12 Column for this weld a			
Seamless Left head weld type	UW12 Column for joining circ weld a			
Seamless Left head weld radiography	Weld Type Number 0			
	Isolated long seam efficiency 1.00			
	Allowed UW12 Column a			
	Allowed Head Efficiency 1.00			
Left Circ Weld: [Category A, B, C or D]				
Corner Left head to body circ-weld type	UW12 Column for this weld a			
None Left head to body circ-weld radiograp	hy Circ seam type number 7			
, <b>3</b> 1	Left circ weld efficiency <b>1.00</b>			
Body Long Seam: [Category A]				
Seamless Body long weld type	1 IW12 column for the body long seam a			
Seamless Body long-weld radiography	LIW12 column for left gire wold			
Body long-weid radiography				
	Long seam type number 0			
left circ efficiency 1	Isolated long seam efficiency 1.00			
right circ efficiency 0.55	Allowed UW12 Column b			
Allowed Circ Efficiency 0.55	Allowed Long Seam Efficiency 0.85			
Right Circ Weld: [Category A, B, C or D]				
<b>Double_Fillet</b> Right head to body circ-weld type	UW12 Column c			
None Right head to body circ-weld radiogra	phy Circ seam type number 4			
	Right circ weld efficiency 0.55			
Right Head: [Category A] - long seam weld in head, I	not head to shell weld			
Semi-Elliptical Right head	UW12 Column for this weld a			
Seamless Right head weld type	UW12 Column for joining circ weld c			
Seamless Right head weld radiography	Weld Type Number 0			
	Isolated long seam efficiency 1 00			
	Allowed LIW/12 Column b			
	Allowed Head Efficiency 0.85			
Notoci	Skotobi			
Notes.	Skelch.			
Body efficiency is reduced by head to body welds				
Right head efficiency is reduced by right head to body weld	$  $ $( \uparrow )$			
right head emplohely is reduced by right head to body weld				
$I_{\rm M}$ 11(2)(5)(b) is motion to the left head				
UW(11/a)(5)(b) is the for the body				
$UW_{11(a)(5)(b)}$ is NOT met for the right hand				
Comments:				
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