

## Welding competition:

The competition is conducted according to these rules.

Before the competition all necessary equipment and material will be prepared and available for the competitors.

It will be possible for the candidates to get acquainted to the workplace and the welding equipment before the competition starts.

## TASK DESCRIPTION:

Tasks		Time per task	Points per task	
A	Horizontal fillet weld	1 hour	24	
B	<del>Horizontal butt weld</del>	1 hour	24	This task is removed from AS19
C	Horizontal fillet weld, square pipe	<del>1, 5 hours</del>	36	
D	Welding of a vessel, the outside corner (fillet weld), all positions. Pressure test with compressed air, 6 bar	2, 5 hours	106	
		Total time: 6 hours	Maximum points: 154	

**Task A:**

**Horizontal fillet weld, MAG (Metal Active Gas welding)**

Place the plates together, use resistance spot welding at the ends to a perpendicular position. Select the filler and weld to the specified on the drawing

**Task B:**

**Horizontal butt weld plate, TIG (Tungsten Inert Gas)**

This task are removed from ArcticSkills 2019

**Task C:**

**Fillet weld, stainless square pipe, TIG (Tungsten Inert Gas)**

Place the parts together and point weld the pipe, endcap and inclined pipe. Choose filler and weld the task

**Task D:**

**Vessel, welding on the outside corner (fillet weld) and butt welds in all positions, MAG, (Metal Active Gas) and MMA (Manual Metal Arc)**

Place the plate pieces together according to the drawing. You might want to use utilities to get the correct angles before they are welded with resistance spot welding. Choose filler and weld the task

The vessel should be pressure tested with compressed air, 6 bar

## Task A:

### Evaluation:

Horizontal fillet weld, 5 mm plate:

Place the plates together, use resistance spot welding at the ends to a perpendicular position.

Select the filler and weld to the specified a-measurements on the drawing

Preparation time:	10 minutes
Break time:	5 minutes
Time to work:	45 minutes
Total time:	60 minutes

The different parts of the task/how to distribute points:		Point
A1:	Health and safety requirements and structure	8
A2:	How the final product is put together	2
A3:	The welding performance is evaluated in a separate form	10
A4:	Tidiness and organization	4
Max point task A		24

## Judges' form:

Task A:  
Horizontal fillet weld.

Competitor:

Group ID	Description	Criteria for evaluation:	Minus point	Max point	Achieved point	Sign
A1:	Health and safety Points might be deducted for severe/repeated violations of the safety and security rules	<u>2 points might be deducted for:</u> Not using necessary clothing Not using personal safety equipment Not using shielding Not using welding extractors		8		
A2:	How the product is put together	<u>2 points might be deducted for:</u> Incorrect angle		2		
A3:	Assessment form	Welding performance		10		
A4:	Tidiness and organization	<u>Up to 4 points might be deducted for</u> Not clearing the workplace after finishing work		4		
				<b>24</b>		

**Task B: Removed from AS19**

## Task C:

### Evaluation:

Fillet weld, stainless square pipe.

Place the parts together and point weld the pipe, endcap and inclined pipe. Choose filler and weld the task

The pipe should be pressure tested with compressed air, 6 bar

Preparation time:	20 minutes
Break time:	5 minutes
Time to work:	65 minutes
Total time:	90 minutes

The different parts of the task/how to distribute points:		Point
C1:	Health and safety requirements and structure	8
C2:	How the final product is put together	4
C3:	The welding performance is evaluated in a separate form	20
C4:	Tidiness and organization	4
C5:	Pressure test, 6 bar	10
	Max point task C	46

## Judges' form:

Task C:

Fillet weld, stainless square pipe.

Competitor:

Group ID	Description	Criteria for evaluation:	Minus point	Max point	Achieved point	Sign
<b>C1:</b>	Health and safety Points might be deducted for severe/repeated violations of the safety and security rules	<u>2 points might be deducted for:</u> Not using necessary clothing Not using personal safety equipment Not using shielding Not using welding extractors		8		
<b>C2:</b>	How the product is put together	<u>2 points might be deducted for:</u> Innaccurate corner Incorrect angle tube		4		
<b>C3:</b>	Assessment form	Welding performance		20		
<b>C4:</b>	Tidiness and organization	<u>Up to 4 points might be deducted for</u> Not clearing the workplace after finishing work		4		
<b>C5:</b>	Pressure test, 6 bar			10		
				<b>46</b>		

## Evaluation:

### Task D:

Vessel, outside corner (fillet weld) and butt welds in all positions.

Place the plate pieces together according to the drawing. You might want to use utilities to get the correct angles before they are welded with resistance spot welding. Choose filler and weld the task

The vessel should be pressure tested with compressed air, 6 bar

Preparation time:	30 minutes
Pause:	10minutes
Time to work:	110 minutes
Total time:	150 minutes

The different parts of the task/how to distribute points:		Point
D1:	Health and safety requirements and structure	8
D2:	How the final product is put together	4
D3:	The welding performance is evaluated in a separate form	80
D4:	Tidiness and organization	4
D5:	Pressure test, 6 bar	10
	Max point task D	106

## Judges' form:

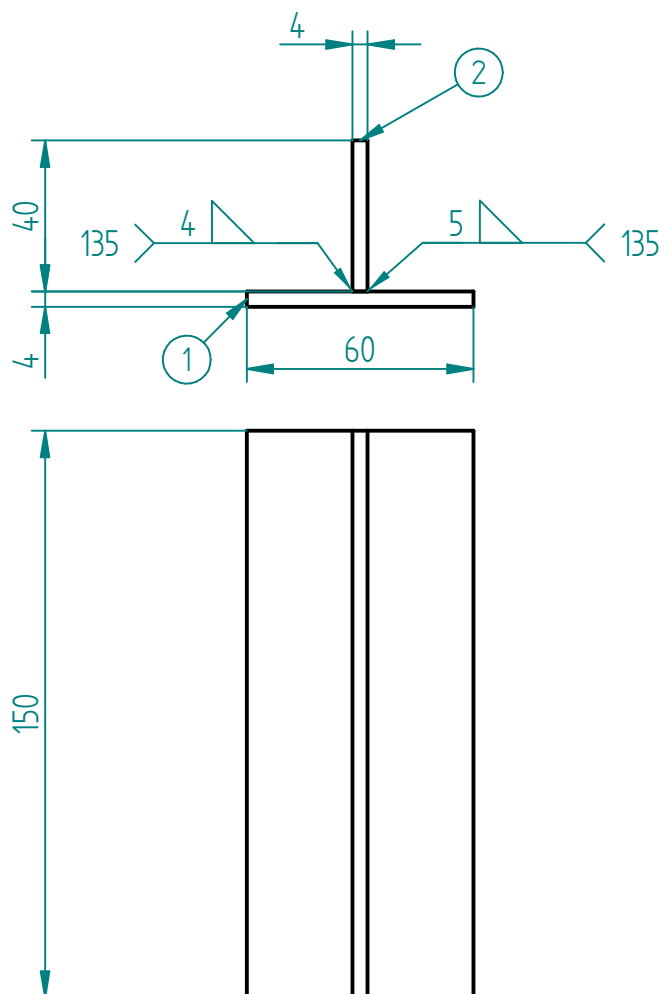
### Task D:

Vessel, outside corner (fillet weld) and butt welds in all positions.

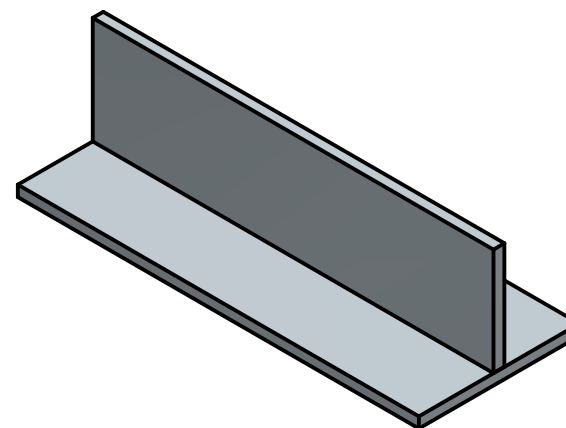
Competitor:

Group ID	Description	Criteria for evaluation:	Minus point	Max point	Achieved point	Sign
D1:	Health and safety Points might be deducted for severe/repeated violations of the safety and security rules	<u>2 points might be deducted for:</u> Not using necessary clothing Not using personal safety equipment Not using shielding Not using welding extractors		8		
D2:	How the product is put together	<u>2 points might be deducted for:</u> Incorrect angle Plates in linear misalignment		4		
D3:	Assessment form	Welding performance		80		
D4:	Tidiness and organization	<u>Up to 4 points might be deducted for</u> Not clearing the workplace after finishing work		4		
D5:	Pressure test, 6 bar			10		
				<b>106</b>		





Item Number	Quantity	Material	Dimension
1	1	Plate low carbon steel	150 x 60 x 4
2	1	Plate low carbon steel	150 x 40 x 4




Welding proses: 135 GMAW (MAG)

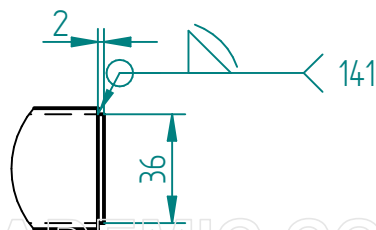
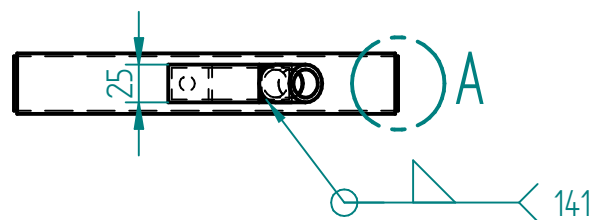
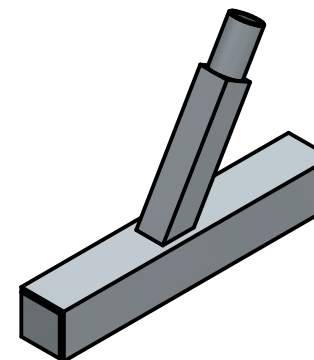
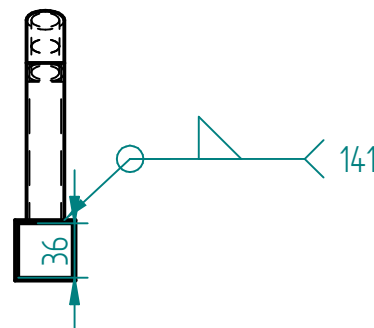
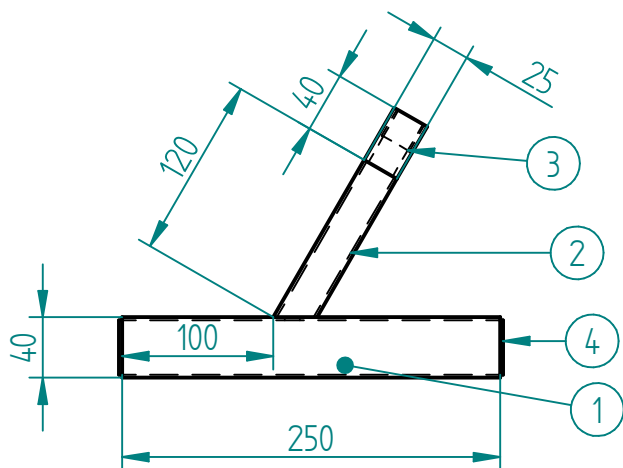
Welding position: PB\_(2F)

Note.

- All tack welds max 10 mm long.
- Weld to deposit with a minimum 2 runs and max 3 runs.

	NAME	DATE	Solid Edge		
DRAWN	J. Pettersen	02/09/16			
CHECKED			TITLE  Task A : Fillet weld		
ENG APPR					
MGR APPR					
			SIZE A4	DWG NO  1	REV  1
			FILE NAME: Task A Fillet weld mag.dft		
			SCALE: 1 : 1	WEIGHT:	SHEET 1 OF 1

Item Number	Quantity	File Name	Material	Dimensions
1*	1	Square tube 40 x 40	Stainless steel	40 x 40 x 2 x 250
2*	1	Square tube 25 x 25	Stainless steel	25 x 25 x 1,5 x 120
3*	1	Muff 25 R3 - 4	Stainless steel	R3/4 $\phi$ 25 x $\phi$ 18,5 x 40
4*	2	End plate	Stainless steel	36 x 36 x 2



DETAIL A

### Task C

#### Instructions to competitors

Material Stainless steel square tube


Welding process: 141 GTAW (TIG)

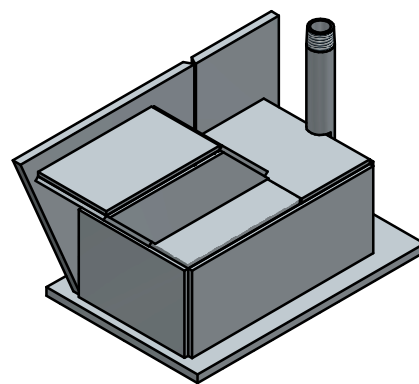
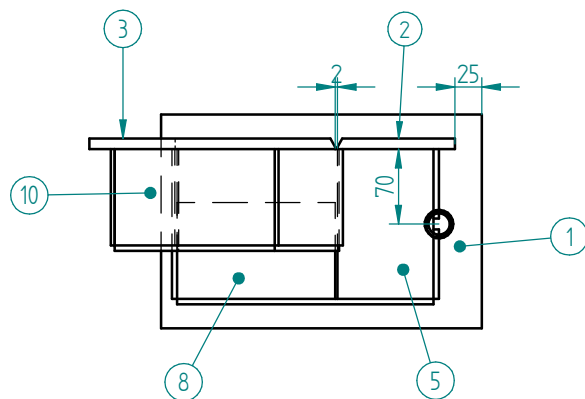
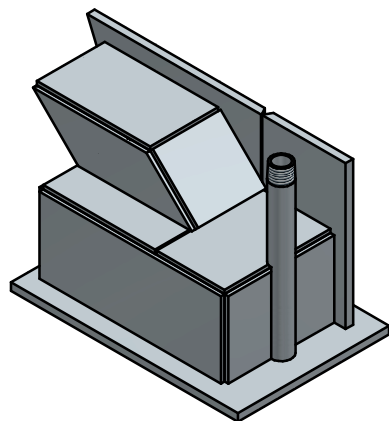
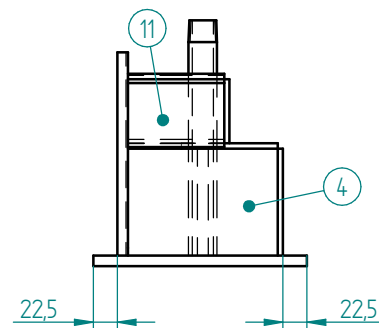
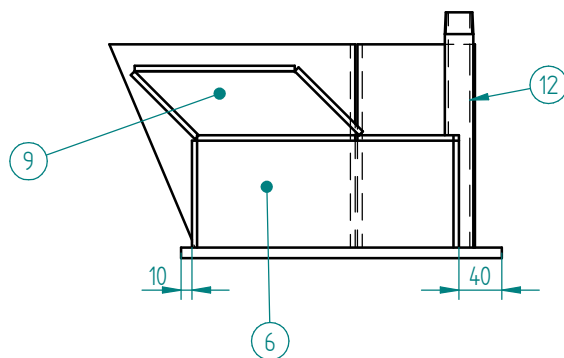
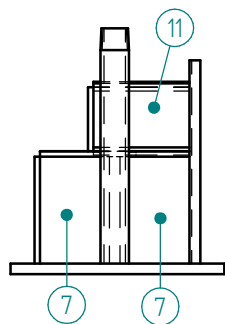
Welding position: PA/PB

#### Note:

Tack weld each side

Any position may be used for tack welding

	NAME	DATE	Solid Edge		
DRAWN	J. Pettersen	02/09/16	TITLE Task C : Fillet weld square tube		
CHECKED					
ENG APPR					
MGR APPR					
			SIZE A4	DWG NO 1	REV 1
			FILE NAME: Task C Fillet weld square tube.dft		
			SCALE: 1:5	WEIGHT:	SHEET 1 OF 1




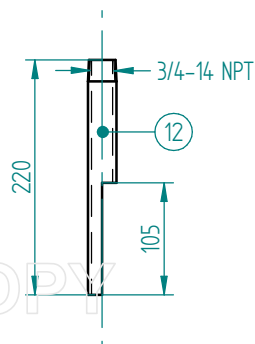
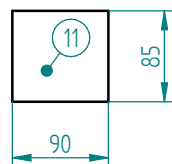
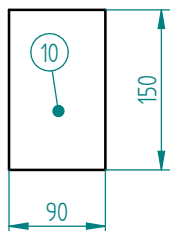
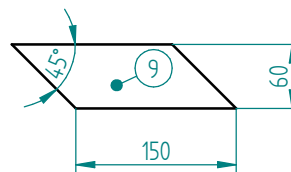
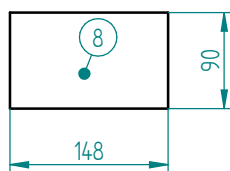
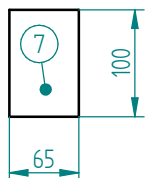
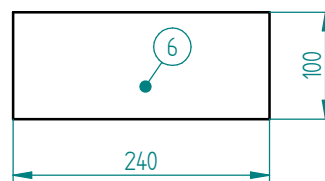
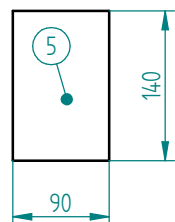
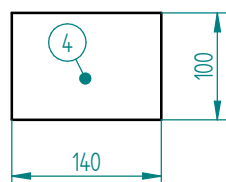
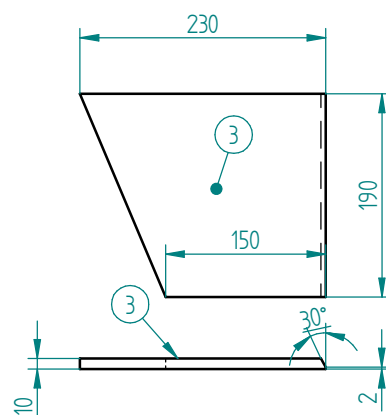
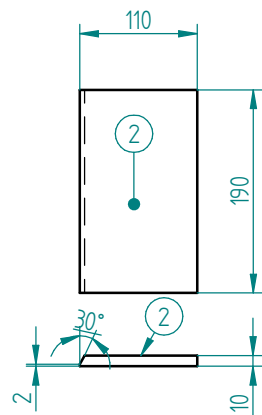
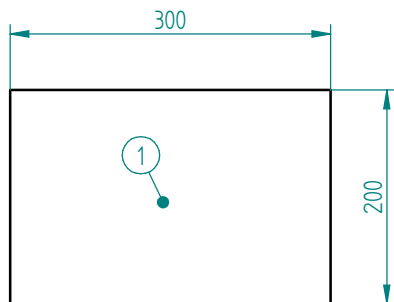
Item Number	Quantity	Material
1*	1	Low carbon steel
2	1	Low carbon steel
3	1	Low carbon steel
4*	1	Low carbon steel
5*	1	Low carbon steel
6*	1	Low carbon steel
7*	2	Low carbon steel
8*	1	Low carbon steel
9*	1	Low carbon steel
10*	1	Low carbon steel
11*	2	Low carbon steel
12*	1	Low carbon steel

## Task D: Vessel


### Instructions to competitors:

- Tack welds should be made in any positions using any processes listed on the drawing
- All tack welds are to be made no longer than 10 mm.
- All welds are to be made with plate 1 in the flat position.
- Outside corner weld radii: 4 mm with tolerance (+1 -0 mm).

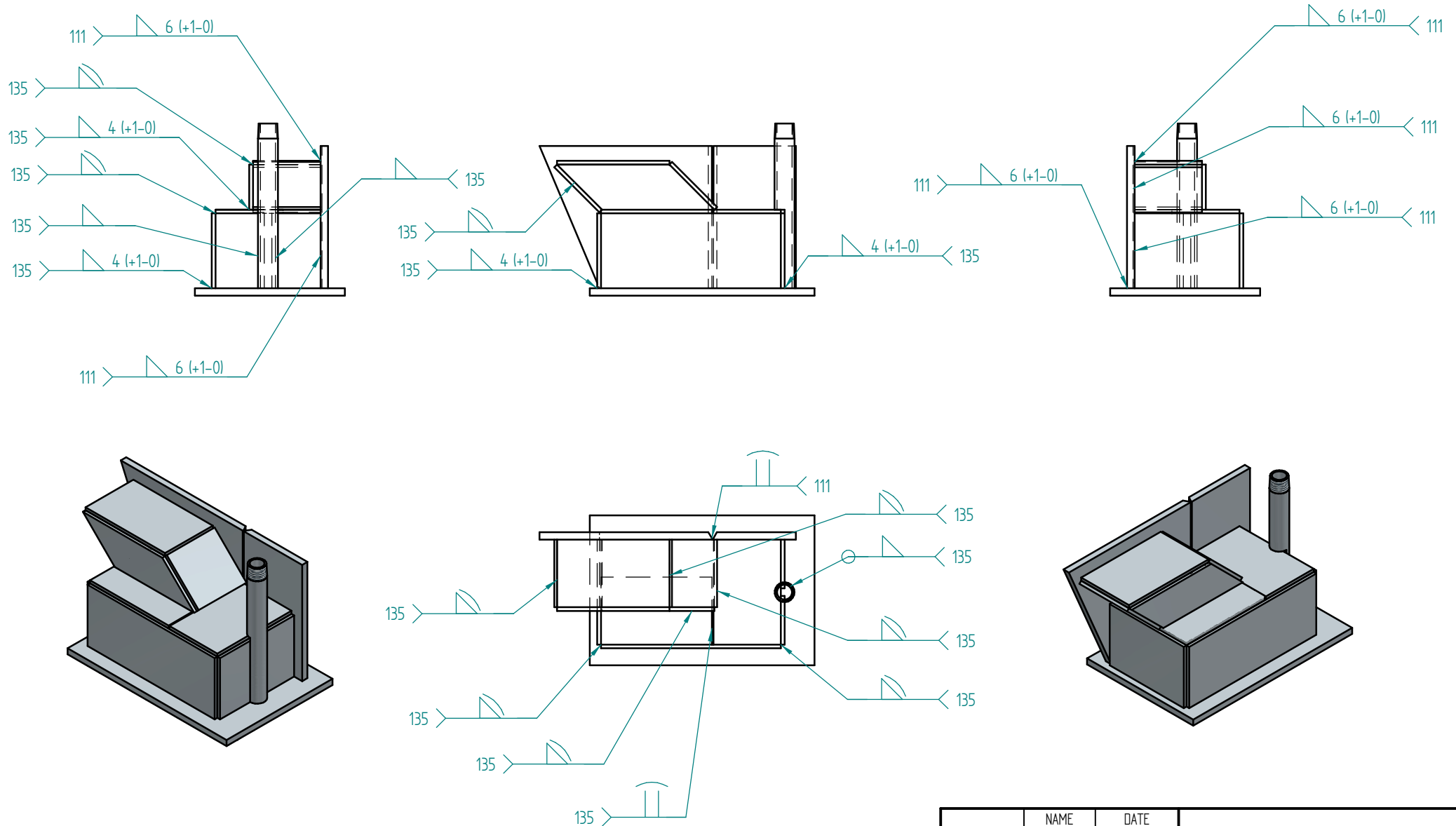
	NAME	DATE	Solid Edge		
DRAWN	1303pejo	03/08/16			
CHECKED			TITLE		
ENG APPR					
MGR APPR			Task D : Vessel		
			SIZE	DWG NO	REV
			A3	1	1
FILE NAME: Vessel - task 0.dft					
SCALE: 1:5		WEIGHT:		SHEET 1 OF 3	




Item Number	Quantity	Material	Dimensions
1	1	Low carbon steel	300 x 200 x 10
2	1	Low carbon steel	190 x 110 x 10
3	1	Low carbon steel	230 x 190 x 150 x 10
4	1	Low carbon steel	140 x 100 x 5
5	1	Low carbon steel	90 x 140 x 5
6	1	Low carbon steel	240 x 100 x 5
7	2	Low carbon steel	65 x 100 x 5
8	1	Low carbon steel	148 x 90 x 5
9	1	Low carbon steel	150 x 60 x 5
10	1	Low carbon steel	90 x 150 x 5
11	2	Low carbon steel	90 x 85 x 5
12	1	Low carbon steel	Pipe 27 x 220

	NAME	DATE	Solid Edge		
DRAWN	1303pejo	03/08/16			
CHECKED			Task D : Vessel		
ENG APPR					
MGR APPR			TITLE		
			SIZE A3	DWG NO 1	REV 1
			FILE NAME: Vessel - task 0.dft		
			SCALE: 1 : 5	WEIGHT:	SHEET 2 OF 3

SOLID EDGE ACADEMIC COPY



SOLID EDGE ACADEMIC COPY

	NAME	DATE	Solid Edge		
DRAWN	1303pejo	03/08/16			
CHECKED			Task D : Vessel		
ENG APPR					
MGR APPR			FILE NAME: Vessel - task 0.dft		
			SIZE	DWG NO	REV
			A3	1	1
			SCALE: 1 : 5		
			WEIGHT:		SHEET 3 OF 3

## ASSESSMENT FORM – WELDING PERFORMANCE

Competitor:	
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Fillet welds:

Task A, C and D.

Welding position	Task	Correct size	Undercut / Underfill	Grinding of weld	Correct welding technique	Correct welding position	No spatter or arc strike	Welding around corners	Welding around ends	Porosity	Surface is uniform and regular	Total points
PA plate	A											
PA tube	C											
PA base plate	D											
PF plate	D											
PF tube 40mm	D											
											Total points	
		Sign.										

**Reference: NS ISO 5817 requirement according to certification standard EN 287-1 2011**

**Point scale:**

**0 feil: 10 point      1 error: 5 point      2-3 error: 2 point**

**More than 3 errors = 0 points**

**Maximum points for fillet welds: 10 x 5 = 50 poeng.**

## ASSESSMENT FORM – WELDING PERFORMANCE

Competitor:	
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Outside corner / fillet welds:

Task C and D.

Welding position	Task	Correct size	Undercut / Underfill	Grinding of weld	Correct welding technique	Correct welding position	No spatter or arc strike	Welding around corners	Welding around ends	Porosity	Surface is uniform and regular	Total points
PA Tube	C											
PA Plate	D											
PF Plate	D											
PC Plate	D											
											Total points	
		Sign.										

**Reference: NS ISO 5817 requirement according to certification standard EN 287-1 2011**

**Point scale:**

**0 feil: 10 point      1 error: 5 point      2-3 error: 2 point      More than 3 errors = 0 points**

**Maximum points for f welds: 10 x 4 = 40 points.**

## ASSESSMENT FORM – WELDING PERFORMANCE

Competitor:	
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Butt welds:

Task B and D.

Welding position	Task	Correct size	Undercut / Underfill	Grinding of weld	Correct welding technique	Correct welding position	No spatter or arc strike	Welding around corners	Welding around ends	Porosity	Surface is uniform and regular	Total points
PF plate	B											
PC plate	D											
PA plate	D											
											Total points	
		Sign: _____										

**Reference: NS ISO 5817 requirement according to certification standard EN 287-1 2011**

**Point scale:**

**0 feil: 10 point**

**1 error: 5 point**

**2-3 error: 2 point**

**More than 3 errors = 0 points**

**Maximum points for butt welds: 10 x 3 = 30 points.**



## ASSESSMENT FORM- PRESSURE TEST

Competitor:	
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Pressure test:  
Task C and D.

Task	Pressure test:			
	No leaks	1 smal leak on 6 bar	Water enters vessel without pressure	Sign.
<b>C</b>				
<b>D</b>				

**No leaks, 10 points**

**1 smal leak on 6 bar, 4-6 points.**

**Water enters vessel without pressure, 0 points.**

**CRITERIA FOR VISUAL EVALUATION:  
WELDING PERFORMANCE:**

**General:**

- Surface slag, spatter and smoke has been removed
- Vessel is free from stray arc strikes
- Joints are free from linear misalignment
- Tie-ins at corner are smooth and continuous to with specification and drawing

**Fillet Weld:**

- Fillet weld size in accordance with specification and drawing
- Welding around ends and corner
- No undercut or underfill
- No spatter or arc strike
- No grinding marks
- Not completely fused to parent material
- Not excessively convex or concave

**Outside corner / fillet weld:**

- Corner welds size in accordance with specification and drawing
- Welding around corners
- Corner welds joint width uniform and regular
- Not completely fused to parent material
- No spatter or arc strike
- No grinding marks

**Butt weld:**

- Butt welds joint width uniform and regular
- No undercut or underfill
- No spatter or arc strike
- No grinding marks