Annex B (Informative)

Sample Welding Procedure Qualification Record (PQR)

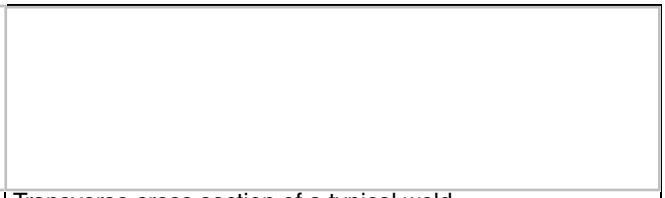
This annex is not part of this standard but is included for informational purposes only.

Company:		**PQR Record No.:**	
Division:		**PQR Record Rev. No.:**	
		Date of original PQR:	
		Date of revised PQR:	

Laser Make and Model		**Serial No.**	
Workstation Make and Model		**Serial No.**	
Process performed on this workstation	Laser Welding	**Product:**	
Date of last calibration of the system:		**Next Cal:**	
Name of Welding Operator:		**Cert. date:**	

Item	**Parameters**			
	Units	Specs	Actual	Comments
Weld Joint				
Weld joint geometry (lap weld, butt weld, fillet weld):				
Type of weld (seam weld, spot weld, stitch weld):				

Engineering drawing showing the location of weld	Schematic cross section of the weld

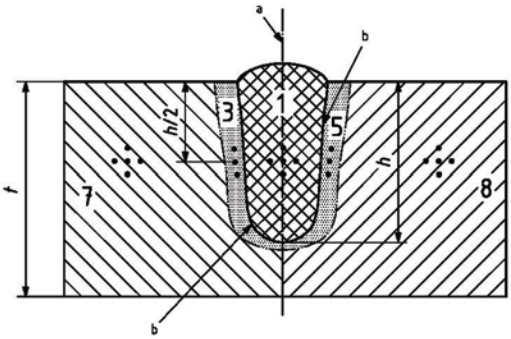
	
Top view of a typical completed weld	Transverse cross section of a typical weld

Materials			
Base metal alloy—workpiece No. 1		Part Number:	
Base metal alloy—workpiece No. 2		Part Number:	
Base metal alloy—workpiece No. 3		Part Number:	
Filler Metal		Part Number:	
Filler Metal	Diameter	(inch-mm)	
Filler Metal	Feed Rate	(inch/min, mm/min)	
Material preparation—workpiece No. 1 (completed?—yes/no)		Notes:	
Material preparation—workpiece No. 2 (completed?—yes/no)		Notes:	
Material preparation—workpiece No. 3 (completed?—yes/no)		Notes:	

Laser weld parameters	**Units**	**Specs**	**Confirm**	
Program number for this operation	#			
Laser power check for this operation	watts			
Laser mode: pulsed or continuous power	P or CW			
Focal length of the final focus optics	Inch [mm]			
Angle of the laser beam to the target	degrees			\
Diameter of the focused laser beam	Inch [mm]			
Amount of defocus of the optics for this operation	Inch [mm]			
Diameter of the focused laser beam on the surface of target	Inch [mm]			
Overlap of weld nuggets	%			
Power ramp up settings	sec			
Power ramp down settings	sec			
Feed rate of weld	Inch/mm [mm/min]			

Hardware details	**Units**	**Specs**	**Actual**	
Fixtures used for this process	P/N			
Calibration and inspection of the fixtures (date of expiration)	date			
Shielding gas—coaxial nozzle—composition	descr.			
Shielding gas—auxiliary nozzle—composition	descr.			
Gas nozzle diameter—coaxial	Inch [mm]			
Gas nozzle diameter—auxiliary	Inch [mm]			

Gas nozzle distance from target—coaxial	Inch [mm]			
Gas nozzle distance from target—auxiliary	Inch [mm]			
Gas flow rate—coaxial	Cfh [l/m]			
Gas flow rate—auxiliary	Cfh [l/m]			
Orientation of the laser beam to the target	Location and orientation of the gas nozzles			

Weld results				
	Metallography			
	Facility where tests were performed		**Date**:	
Transverse cross section of weld with dimensions added (may supply several)	Longitudinal cross of the weld			
	Microhardness measurements			
	Facility where tests were performed		**Date**:	
	Guideline: ISO 22826 (Diagram shows partial penetration)			

Average reading—parent material	Rc		Specification: _____
Average readings—heat-affected zone	Rc		Specification: _____
Average readings—weld nugget	Rc		Specification: _____
	Tensile tests		
	Facility where tests were performed	**Date:**	

Specimen No.	Width	Thickness	Area	Ultimate Total Load (lb.)	Ultimate Unit Stress (psi)	Type of Failure and Location
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

	Guided bend tests			
	Facility where tests were performed		**Date:**	

Type and Figure No.	Result
_____	_____
_____	_____
_____	_____
_____	_____

	Toughness tests		
	Facility where tests were performed		**Date:**

Specimen No.	Location Notch	Notch Type	Test Temp.	Impact Values	Lateral Exp.		Drop Weight	
					% Shear	Mils	Break	No Break
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

	Hermeticity tests					
	Facility where tests were performed:			**Date:**		
	Readings—average of XX readings:	ccHe/sec			Specification:	
	Other tests					
	Facility where tests were performed			**Date:**		
	Weld monitor results			**Date:**		

	File number:					
	Number of welds recorded:					
	Number of welds under the lower limits:					
	Number of welds over the upper limits:					

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of AWS C7.4/C7.4M:2017.

Signed:		Date:	

Title:	