			
Linde Plant ID		Air Separation Plant	
Linde Project No. tbd		Client Project No.	
Linde Project Code tbd		Client Code	
Linde Doc. No. &AA-W-SK 2611 (EN)		Client Doc. No.	Client Rev.

Corrosion Protection

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Rules of Measurement

	Inquiry	1.0	14.04.2022	E. Pitsiou, GCP	D. Bumann, GCP	E. Pitsiou, GCP	
Status	Purpose	Issue	Date	Prepared	Reviewed	Approved	Remark

Rules of Measurement - Corrosion Protection

General Definitions

- Any activities resulting from contractors failure or the need for rework of imperfections caused by contractor shall not be compensated.
- Any work exceeding the requirements defined in IFC documents will not be compensated
- Additional work or work on items not contained in this catalogue will only be paid after COMPANY approval. CONTRACTOR shall propose a feasible, prized solution prior to start of any work shortly (but no more than 4 weeks) after the deviation was detectable.
- Other cost drivers except the ones mentioned in this document shall not be used to define measurements. Particulary no distinction shall be made for different heights of working places be it high or low, for restricted spaces, dirt, weather conditions or other construction influences.
- Quantity determination for invoicing shall as far as feasible be obtained from IFC drawings issued by COMPANY or (if applicable) from red-marked as-built drawings by contractor and signed and approved by COMPANY.
- Only if quantity determination based on documentation is not feasible, actual, physical measurements in the field shall be taken.

Compensated quantity is displayed as

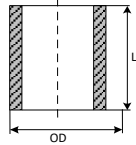
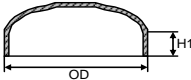
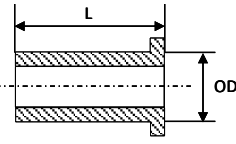
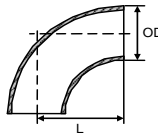
"Quantity Count" [Unit of Measurement] @ "Item Selection Criteria in BOQ"

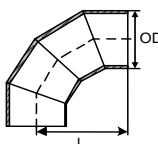
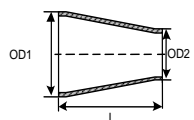
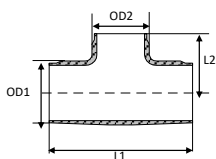
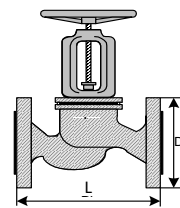
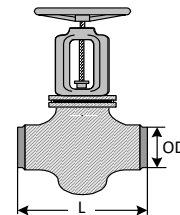
with "Quantity Count" defining the multiplier with the unit rate per single item to obtain the price per item
and "Item Selection Criteria in BOQ" identifying the line item in the BOQ and the corresponding unit rate to be applied.

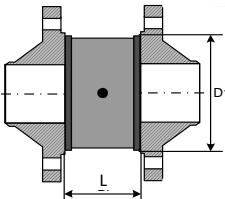
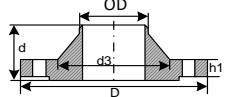
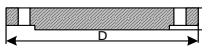
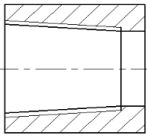
Corrosion Protection of Piping

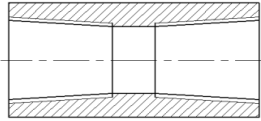
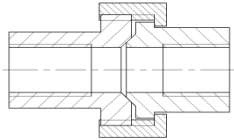
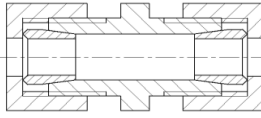
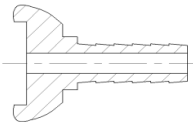
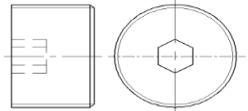
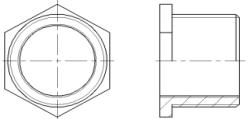
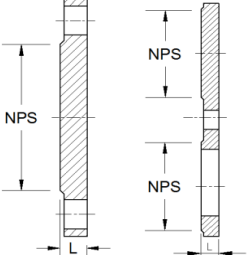
Applicable for BOQ chapters

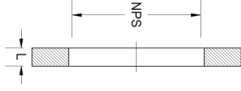
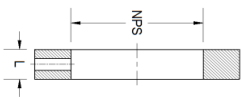
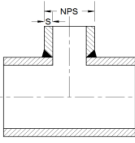
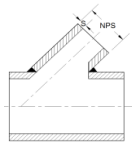
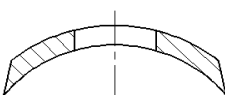
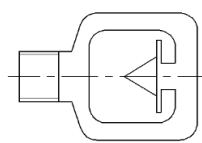
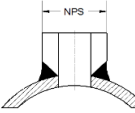
260.20.XX.XX - Corrosion Protection of Piping

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Range	Drawings	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Piping	Straight Piping	as per BOQ	"OD": Outer Diameter "L": Linear length "Sys": Paint System	No range distinction		$OD \cdot \pi \cdot L$ [m2] @ Sys	$OD \cdot \pi \cdot L$ [ft2] @ Sys
1N Fittings (Buttweld, Socketweld and Threaded Fittings)	Cap	as per BOQ	"OD": Outer Diameter "Sys": Painting System	No range distinction		$1,08 \cdot OD^2 + OD \cdot \pi \cdot H1$ [m2] @ Sys	$1,08 \cdot OD^2 + OD \cdot \pi \cdot H1$ [ft2] @ Sys
	Stub End	as per BOQ	"OD": Outer Diameter "L": Linear Length along centerline of stub-end acc. to isometric "Sys": Painting System	No range distinction		$OD \cdot \pi \cdot L$ [m2] @Sys	$OD \cdot \pi \cdot L$ [ft2] @Sys
	Elbows - 45° - 60° - 90°	as per BOQ	"OD": Outer Diameter "L": Linear length between edge and theoretical intersection of centerlines "Sys": Painting System	No range distinction		$0,5 \cdot OD \cdot L \cdot \pi$ [m2] @ Sys	$0,5 \cdot OD \cdot L \cdot \pi$ [ft2] @ Sys

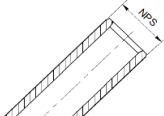
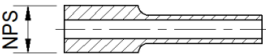
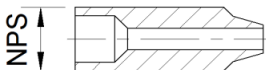
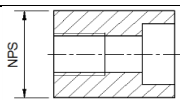
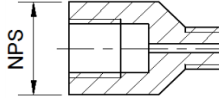
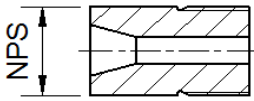
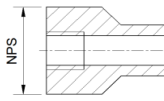
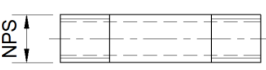
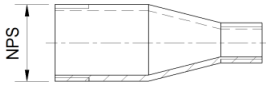
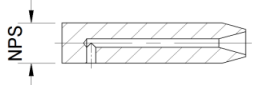
2N Fittings (Buttweld, Socketweld and Threaded Fittings)	Mitre Bend	as per BOQ	"OD": Outer Diameter "L": Linear length between edge and theoretical intersection of centerlines "Sys": Painting System	No range distinction		$0,5 \cdot OD \cdot L \cdot \pi^{1/2}$ [m2] @ Sys	$0,5 \cdot OD \cdot L \cdot \pi^{1/2}$ [ft2] @ Sys
	Reducer - eccentric - concentric	as per BOQ	"OD": Outer Diameter "L": Linear length between edge and theoretical intersection of centerlines "Sys": Painting System	No range distinction		$0,5 \cdot L \cdot \pi \cdot (OD1 + OD2)$ [m2] @ Sys	$0,5 \cdot L \cdot \pi \cdot (OD1 + OD2)$ [ft2] @ Sys
3N Fittings (Buttweld, Socketweld and Threaded Fittings)	T-Piece - reducing - straight	as per BOQ	"OD1": Outer Diameter run pipe "L1": Linear length run pipe "OD2": Outer Diameter branch pipe "L2": Linear Length Branch Pipe "Sys": Painting System	No range distinction		$\pi \cdot (L \cdot OD1 + 0,5 \cdot L2 \cdot OD2)$ [m2] @ Sys	$\pi \cdot (L \cdot OD1 + 0,5 \cdot L2 \cdot OD2)$ [ft2] @ Sys
Valves	Flanged Valve	- covering or taping of sensitive surfaces which shall not be painted (e.g. but not limited to valve spindle, packing, flange faces, valve tags etc.) - painting of flanges, bonnets, hand- wheels and gear operators associated with the valve	"D": Flange Diameter "L": Installation length of valve "Sys": Painting System	NPS ≤20" (≤ DN500)		$1,5 \cdot \pi \cdot L \cdot D$ [m2] @ Sys	$1,5 \cdot \pi \cdot L \cdot D$ [ft2] @ Sys
				NPS > 20" (> DN500)		$1,4 \cdot \pi \cdot L \cdot D$ [m2] @ Sys	$1,4 \cdot \pi \cdot L \cdot D$ [ft2] @ Sys
	Welded Valve		"OD": Outer diameter of connecting pipe "L": Installation length of valve "Sys": Painting System	NPS ≤20" (≤ DN500)		$1,5 \cdot \pi \cdot L \cdot D^{1,4}$ [m2] @ Sys	$1,5 \cdot \pi \cdot L \cdot D^{1,4}$ [ft2] @ Sys
				NPS > 20" (> DN500)		$1,4 \cdot \pi \cdot L \cdot D^{1,4}$ [m2] @ Sys	$1,4 \cdot \pi \cdot L \cdot D^{1,4}$ [ft2] @ Sys

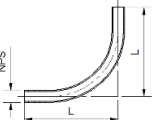
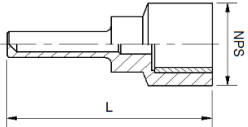
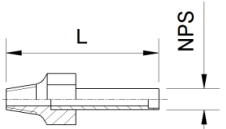
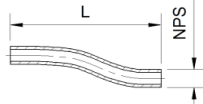
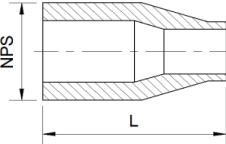
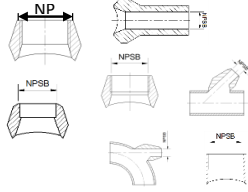
	Wafer type Valve		"D1": Outer diameter of wafer type valve "L": Installation length of wafer type valve "Sys": Painting System	No range distinction		$1,3 \pi \cdot L \cdot D1 \text{ [m2] @ Sys}$	$1,3 \pi \cdot L \cdot D1 \text{ [ft2] @ Sys}$
Flanges	Flange	- covering or taping of sensitive surfaces which shall not be painted (e.g. but not limited to flange faces, etc.)	"D": Outer diameter of flange "h1": Height of flange disc "d3": base diameter of flange cone "OD" Outer diameter of connecting pipe "d": total height of flange "Sys": Painting System	No range distinction		$1,3 \pi \cdot (D \cdot h1 + 0,25 \cdot (D^2 - d3^2) + OD(0,25(d3 - OD)^2 + (d - h1)^2))^{(0,5)} \text{ [m2] @ Sys}$	$1,3 \pi \cdot (D \cdot h1 + 0,25 \cdot (D^2 - d3^2) + OD(0,25(d3 - OD)^2 + (d - h1)^2))^{(0,5)} \text{ [ft2] @ Sys}$
	Blind Flange	- covering or taping of sensitive surfaces which shall not be painted (e.g. but not limited to flange faces, etc.)	"D": Outer Diameter of blind flange "h": Height of blind flange "Sys": Painting System	No range distinction		$1,3 \pi \cdot D \cdot (h + 0,25D) \text{ [m2] @ Sys}$	$1,3 \pi \cdot D \cdot (h + 0,25D) \text{ [ft2] @ Sys}$
Pipe Supports	Pipe supports	as per BOQ	"WGT": Single weight of pipe support [kg] "Sys": Painting System	No range distinction	N/A	$0,04 \text{ m2/kg} \cdot \text{WGT} \text{ [m2] @ Sys}$	$0,04 \text{ m2/kg} \cdot \text{WGT} \text{ [ft2] @ Sys}$
	Half Couplings	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.

Unions for threaded, socket weld and tubing and hose connections	Couplings	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	Pipe Unions (threaded and SW)	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	Tube Connections (e.g. Ermeto Unions, Swagelok...)	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	Hose Couplings (e.g. crowfoot hose couplings)	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Plugs & Bushings	Plugs	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	Bushings	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Blinds, Plates, Rings	Blinds, Plates - Figure 8 blinds, - blind flanges, - reducing flanges (LS491-11Pt03), - blind flanges with threaded hole (LS491-11Pt03), - spades, - slip plates, rupture discs	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.

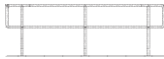





	Rings spacer rings, slip rings, bleed or drip rings	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	Orifice Plate	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Branches	90° Branch	Not measured	Not measured	Not measured		Shall be compensated like a T-Piece	Shall be compensated like a T-Piece
	45°/60° Branch	Not measured	Not measured	Not measured		Shall be compensated like a T-Piece	Shall be compensated like a T-Piece
Reinforce- ment Pads	Reinforcement pads acc. to LS433-15 or Project Specification	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	General nozzles, nipples and attachments to piping or coldbox shells with Diameter smaller or equal to 4" (100mm) and linear length smaller or equal to 500mm (20 inch)	Not measured	Not measured	Not measured	N/A	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	Deluge nozzles & spray nozzles for fire fighting systems	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
	High Pressure Nozzle AB acc. LS491-11-T02	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.

Pipe
Attachments

Inclined Nozzle AD acc. LS491-11-T02	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Coldbox Nozzle acc. LS491-11-T02	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Reducers concentric type K-HA and K-HB acc. LS491-11-T04	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Adaptors K, KA, KF, KK acc. LS491-11-T05	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Adaptors KG, KH acc. LS491-11-T05	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Adaptors for Pressure Measurement KB, KC acc. LS491-11-T05	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Inserts P acc. LS491-11-T05	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Nipples acc. LS491-11-T06	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Swaged Nipples concentric & eccentric acc. MSS-SP-95	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Analysis Pipe XE, XS acc. LS491-11-T07	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.

Bent Pipes and Siphons XA, XB, XC acc. LS491-11-T07	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Thermometer nozzles (acc. to LS491-08)	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Threaded Sockets (acc. to LS491-08)	Not measured	Not measured	Not measured	N/A	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Pipe Nozzle for connection on threaded socket (acc. to LS491-08)	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Pressure Tap Nozzle (acc. to LS491-08)	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Nozzle AY acc. LS433-12 (ASME) LS433-14 (DIN/EN)	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.
Olets: - Coupolet - Elbolet - Latrolet - Thredolet - Sockolet - Nipolet - Sweepolet - Weldolet	Not measured	Not measured	Not measured		Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.	Painting of minor items not measured for compensation purposes. To be covered in painting of straight pipes and fittings.

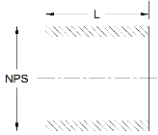
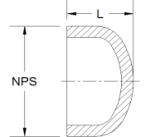
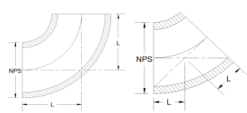
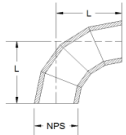
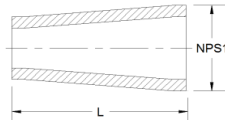
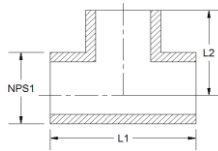
Corrosion Protection of Equipment							
Applicable for BOQ chapters 260.30.XX.XX. - Corrosion Protection of Equipment							
Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Range	Drawings	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Equipment	Equipment	- painting of surfaces protruding or retracting from the shell surface e.g. but not limited to manholes, handholes, nozzles, flanges, skirts, supports, saddles etc.	"A": Surface of the outer equipment shell as per drawings or mechanical data sheet "Sys": Painting System	No range distinction	N/A	A [m2] @ Sys	A [ft2] @ Sys
Corrosion Protection of Structural Steel							
Applicable for BOQ chapters 260.40.XX.XX. - Corrosion Protection of Structural Steel							
Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Range	Drawings	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Structural Steel	Light section (less than 21 kg/m)	as per BOQ	"WGT": Total weight "Sys": Painting System	No range distinction	N/A	35 [m2/t] * WGT [t] @ Sys	35 [ft2/t] * WGT [t] @ Sys
	Medium sections (21 - 65 kg/m)	as per BOQ	"WGT": Total weight	No range distinction	N/A	26 [m2/t] * WGT [t] @ Sys	26 [ft2/t] * WGT [t] @ Sys
	Heavy sections (65 - 135 kg/m)	as per BOQ	"WGT": Total weight	No range distinction	N/A	20 [m2/t] * WGT [t] @ Sys	20 [ft2/t] * WGT [t] @ Sys
	Extra heavy sections (greater than 135 kg/m)	as per BOQ	"WGT": Total weight	No range distinction	N/A	12,5 [m2/t] * WGT [t] @ Sys	12,5 [ft2/t] * WGT [t] @ Sys
	Gusset and stiffener plates	as per BOQ	"WGT": Total weight	No range distinction	N/A	included in above quantities	included in above quantities
Planar Geometry Items	structural steel for coldbox shell outside	as per BOQ	"A": Surface of the outer coldbox shell as per design drawings "Sys": Painting System	No range distinction	N/A	A [m2] @ Sys	A [ft2] @ Sys
	structural steel for ducts	as per BOQ	"A": Outer Surface of the duct as per design drawings "Sys": Painting System	No range distinction	N/A	A [m2] @ Sys	A [ft2] @ Sys

Non Planar geometry items	Railing straight at platforms	as per BOQ	"WGT": Total weight	No range distinction		45 [m2/t] * WGT [t] @ Sys	45 [ft2/t] * WGT [t] @ Sys
	Railing at stairs	as per BOQ	"WGT": Total weight	No range distinction		45 [m2/t] * WGT [t] @ Sys	45 [ft2/t] * WGT [t] @ Sys
	Railing bended for circular platforms	as per BOQ	"WGT": Total weight	No range distinction		45 [m2/t] * WGT [t] @ Sys	45 [ft2/t] * WGT [t] @ Sys
	Ladders, including cages	as per BOQ	"WGT": Total weight	No range distinction		35 [m2/t] * WGT [t] @ Sys	35 [ft2/t] * WGT [t] @ Sys
	Safety gates	as per BOQ	"WGT": Total weight	No range distinction		35 [m2/t] * WGT [t] @ Sys	35 [ft2/t] * WGT [t] @ Sys
	Davit	as per BOQ	"WGT": Total weight	No range distinction		35 [m2/t] * WGT [t] @ Sys	35 [ft2/t] * WGT [t] @ Sys

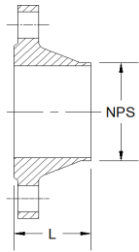
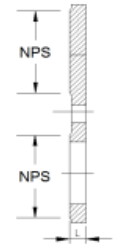
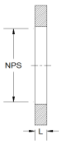
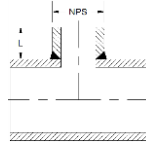
Inside Blasting of Piping

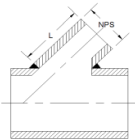
Applicable for BOQ chapters

260.50.XX.XX. - Inside Blasting of Piping

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Range	Drawings	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Straight pipe	Pipe	as per BOQ	"NPS": Nominal Pipe Size "L": Linear Length along centerline of pipe acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS
1N Fittings (Buttweld, Socketweld and Threaded Fittings)	Cap	as per BOQ	"NPS": Nominal Pipe Size "L": Linear Length along centerline of cap acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS
2N Fittings (Buttweld, Socketweld and Threaded Fittings)	Elbow - 90°, - 45°, - long radius, - short radius	as per BOQ	"NPS": Nominal Pipe Size "L": Linear length between edge and theoretical intersection of centerlines	No range distinction		2*L [m] @NPS	2*L [ft] @NPS
	Mitre Bend	as per BOQ	"NPS": Nominal Pipe Size "L": Linear length between edge and theoretical intersection of centerlines	No range distinction		2*L [m] @NPS	2*L [ft] @NPS
	Reducer - eccentric, - concentric	as per BOQ	"NPS": Nominal Pipe Size "L": Linear Length along centerline of reducer acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS
3N Fittings (Buttweld, Socketweld and Threaded Fittings)	T-Piece - reducing - straight	as per BOQ	"NPS": Nominal Pipe Size "L1": Linear Length along centerline of run pipe acc. to isometric "L2": Linear Length along centerline of branch pipe acc. to isometric	No range distinction		L1+L2 [m] @NPS	L1+L2 [ft] @NPS

Unions for threaded, socket weld and tubing and hose connections	Half Couplings	Not measured	Not measured	Not measured	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Couplings				Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Pipe Unions - threaded - Socket Weld				Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Tube Connections (e.g. Ermeto Unions, Swagelok...)				Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Hose Couplings (e.g. crowfoot hose couplings)				Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
Plugs & Bushings	Plugs	Not measured	Not measured	Not measured	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Bushings	Not measured	Not measured	Not measured	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.

Flanges	Flange - Flat Face Flange (FF), - Raised Face Flange (RF), - Male-Female Face Flange (M/F), - Tongue-Groove Face Flange (T/G), - Ring type joint flange (RTJ), - Slip on flanges acc. LS421-60)	as per BOQ	"NPS": Nominal Pipe Size "L": Linear length along centerline of flange acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS
	Orifice Flange	Installation of orifice plate	"NPS": Nominal Pipe Size "L": Linear length along centerline of flange acc. to isometric	measured as regular flange	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
Blinds, Plates, Rings	Blinds, Plates - Figure 8 blinds, - blind flanges, - reducing flanges (LS491-11Pt03), - blind flanges with threaded hole (LS491-11Pt03), - spades, - slip plates, rupture discs	as per BOQ	"NPS": Nominal Pipe Size "L": Linear length along centerline of blind acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS
	Rings spacer rings, slip rings, bleed or drip rings	as per BOQ	"NPS": Nominal Pipe Size "L": Linear length along centerline of ring acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS
	Orifice Plate	as per BOQ	Not measured	Not measured	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
Branches	90° Branch	as per BOQ	"NPS": Nominal Pipe Size of branch "L": Linear length along centerline of branch acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS

Branches	45°/60° Branch	as per BOQ	"NPS": Nominal Pipe Size of branch "L": Linear length along centerline of branch acc. to isometric	No range distinction		L [m] @NPS	L [ft] @NPS
Reinforcement Pads	Reinforcement pads acc. to LS433-15 or Project Specification	as per BOQ	Not measured	Not measured	Sketch, see above.	Installation not measured for compensation purposes. Installation to be covered with welding of reinforcement pad.	Installation not measured for compensation purposes. Installation to be covered with welding of reinforcement pad.
	General nozzles, nipples and attachments to piping or coldbox shells with Diameter smaller or equal to 4" (100mm) and linear length smaller or equal to 500mm (20 inch)	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Deluge nozzles & spray nozzles for fire fighting systems	as per BOQ	Not measured	Not measured	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	High Pressure Nozzle AB acc. LS491-11-T02	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Inclined Nozzle AD acc. LS491-11-T02	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.

Pipe Attachments	Coldbox Nozzle acc. LS491-11-T02	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Reducers concentric type K-HA and K-HB acc. LS491-11-T04	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Adaptors K, KA, KF, KK acc. LS491-11-T05	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Adaptors KG, KH acc. LS491-11-T05	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Adaptors for Pressure Measurement KB, KC	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Inserts P acc. LS491-11-T05	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Nipples acc. LS491-11-T06	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Swaged Nipples concentric & eccentric acc. MSS-SP-95	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Analysis Pipe XE, XS acc. LS491-11-T07	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Bent Pipes and Siphons XA, XB, XC acc. LS491-11-T07	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Thermometer nozzles (acc. to LS491-08)	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Threaded Sockets (acc. to LS491-08)	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Pipe Nozzle for connection on threaded socket (acc. to LS491-08)	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Pressure Tap Nozzle (acc. to LS491-08)	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.

	Nozzle AY acc. LS433-12 (ASME) LS433-14 (DIN/EN)	as per BOQ	Not measured	NPS: 0"-4"	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.
	Olets: - Coupolet - Elbolet - Latrolet - Threadolet - Sockolet - Nipolet - Sweepolet - Weldolet	as per BOQ	Not measured	No range distinction	Sketch, see above.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.	Inside blasting not measured for compensation purposes. To be covered in other inside blasting rates.

Labeling and Installation of Signs

Applicable for BOQ chapters

260.60.XX.XX. - **Labeling and Installation of Signs**

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Range	Drawings	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Pipe Labeling	Pipe Labeling	as per BOQ	"QTY": Quantity of labels "W": Width of character "H": Height of character	No range distinction	N/A	QTY [PC] @W, H	QTY [PC] @W, H
Equipment Labeling	Equipment Labeling	as per BOQ	"QTY": Quantity of labels "W": Width of character "H": Height of character	No range distinction	N/A	QTY [PC] @W, H	QTY [PC] @W, H
NFPA Diamond Labeling	NFPA Diamond Labeling	as per BOQ	"QTY": Quantity of labels "M": Measurements of the diamond	No range distinction	N/A	QTY [PC] @ M	QTY [PC] @ M
Safety Signs	Safety Signs	Signs with dimensions that differ by +/- 10% from the measurements of the sign stated in the BOQ	"QTY": Quantity of labels "M": Measurements of the sign	No range distinction	N/A	QTY [PC] @ M	QTY [PC] @ M