			
Linde Plant ID		<b>Air Separation Plant</b>	
Linde Project No. <b>tbd</b>		Client Project No.	
Linde Project Code <b>tbd</b>		Client Code	
Linde Doc. No. <b>&amp;AA-W-SK 2711 (EN)</b>		Client Doc. No.	Client Rev.

# Insulation

-

## Rules of Measurement


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

# Rules of Measurement - Insulation

## 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 after the deviation was detectable.
- Other cost drivers except the ones mentioned in this document shall not be used to define measurements. Particularly 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, signed and approved by COMPANY.
- Only if quantity determination based on documentation is not feasible, actual, physical measurements in the field shall be taken.
- Quantity will be paid as per nominal insulation thickness, not as per construction insulation thickness. Construction insulation thickness equals nominal insulation thickness plus space /perimeter increase due to installation of electrical heat tracing, steam heat tracing, spacing layer, method of installation etc.
- Flattenings, cut-outs or projections will not be paid or measured separately
- For compensation of combined insulation systems layers of both subsystems shall be summed up for determination of the BOQ line item; surface shall be determined based on the combined insulation thickness of both systems.

### 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.

### Definition of Layers

Tabelle

Bezug auf BoQ Kapitel

## Insulation of Piping according Linde Factor System

Applicable for BOQ chapters

270.10.10.xx - **Insulation according Linde Factor System - All Insulation types and thicknesses**

270.20.xxx - **Insulation Material**

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Drawing	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Linde Factor System	Linde Factor System	Please refer to the respective documents describing rules of measurement for the Linde Factor System.				

## Insulation of Straight Pipes, Fittings, Flanges and Supports

Applicable for BOQ chapters

270.20.xxx - **Insulation Material**

270.1xx.10.xxx - **Insulation system** \* - Straight Pipes, Fittings, Flanges and Supports

270.2xx.10.xxx - **Insulation system** \* - Straight Pipes, Fittings, Flanges and Supports

270.3xx.10.xxx - **Insulation system** \* - Straight Pipes, Fittings, Flanges and Supports

270.4xx.10.xxx - **Insulation system** \* - Straight Pipes, Fittings, Flanges and Supports

270.5xx.10.xxx - **Insulation system** \* - Straight Pipes, Fittings, Flanges and Supports

### Calculation of the Compensated Surface:

The diameter ("DINS") decisive for the calculation of the insulation surface for cladding (outer layer) is calculated as follows:

"DINS": Insulation Diameter =  $OD + 2 \cdot IT$

with "OD": Outer Diameter of the Pipe , "IT": Insulation Thickness

Thickness of cladding, guards, foils, vapor barrier and the like will not be considered for calculation purposes!

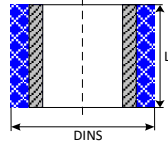
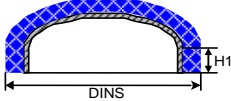
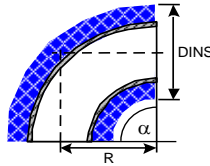
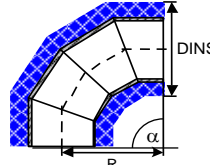
For all referred chapters the insulation surface is calculated based on this Insulation Diameter "DINS"

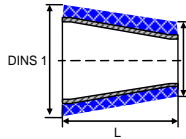
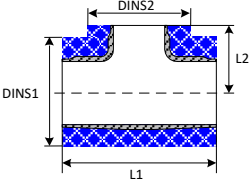
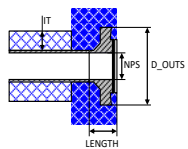
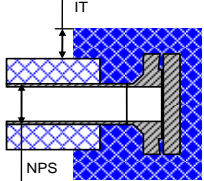
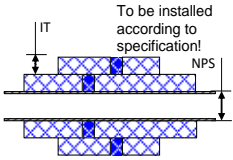
### Combined Insulation Systems:

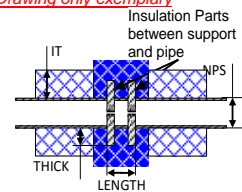
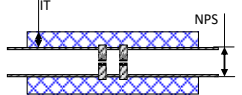
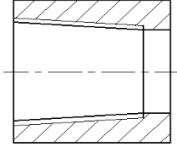
In case an insulation is a combined of two insulation types (e.g. Cold 40mm and Sound 100mm, 1 m long straight pipe @ NPS 10") the calculation of the surface shall be as follows:

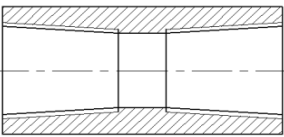
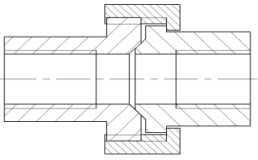
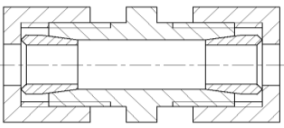
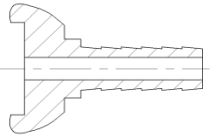
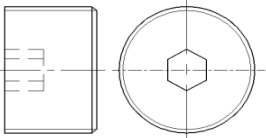
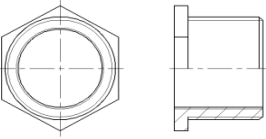
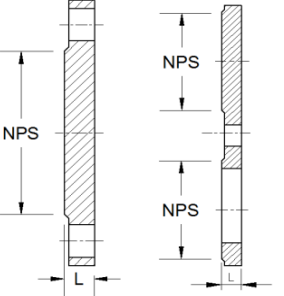
"DINS": Insulation Diameter =  $OD + 2 \cdot (IT1 + IT2)$

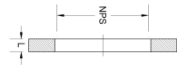
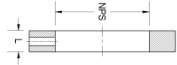
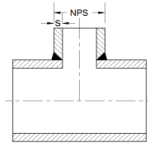
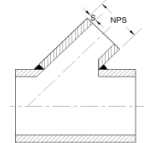
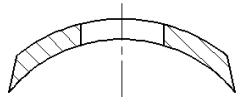
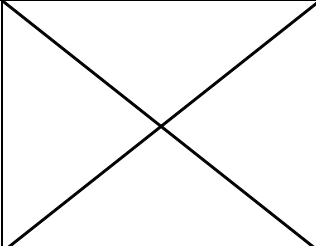
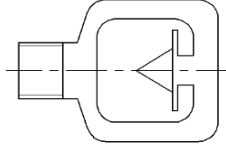
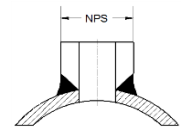
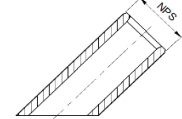
with "OD": Outer Diameter of the Pipe , "IT1": Insulation Thickness Inner System, "IT2": Insulation Thickness Outer System

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Drawing	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Piping	Straight Piping	as per BOQ	"DINS": Insulation Diameter "L": Linear length "IS": Insulation System "NPS": Nominal Pipe Size "NL": number of layers		$DINS \cdot \pi \cdot L$ [m <sup>2</sup> ] @ IS & NPS & NL	$DINS \cdot \pi \cdot L$ [ft <sup>2</sup> ] @ IS & NPS & NL
1N Fittings (Buttweld, Socketweld and Threaded Fittings)	Cap	as per BOQ	"DINS": Insulation Diameter "H1": Height of ring "IS": Insulation System "NPS": Nominal Pipe Size "NL": Number of layers		$1,08 \cdot DINS^2 + DINS \cdot \pi \cdot H1$ [m <sup>2</sup> ] @ IS & NPS & NL	$1,08 \cdot DINS^2 + DINS \cdot \pi \cdot H1$ [ft <sup>2</sup> ] @ IS & NPS & NL
	Elbows 90° and <90° with angle $\alpha$	as per BOQ	"DINS": Insulation Diameter "R": Centerline Radius of elbow " $\alpha$ ": angle in [°] of elbow "IS": Insulation System "NPS": Nominal Pipe Size "NL": Number of layers		$\frac{\alpha}{90^\circ} \cdot 0,5 \cdot DINS \cdot L \cdot \pi$ [m <sup>2</sup> ] @ IS & NPS & NL	$\frac{\alpha}{90^\circ} \cdot 0,5 \cdot DINS \cdot L \cdot \pi$ [ft <sup>2</sup> ] @ IS & NPS & NL
	Mitre Bend 90° and <90° with angle a	as per BOQ	"DINS": Insulation Diameter "R": Centerline Radius of mitre bend " $\alpha$ ": angle in [°] of mitre bend "IS": Insulation System "NPS": Nominal Pipe Size "NL": Number of layers		$\frac{\alpha}{90^\circ} \cdot 0,5 \cdot DINS \cdot L \cdot \pi$ [m <sup>2</sup> ] @ IS & NPS & NL	$\frac{\alpha}{90^\circ} \cdot 0,5 \cdot DINS \cdot L \cdot \pi$ [ft <sup>2</sup> ] @ IS & NPS & NL

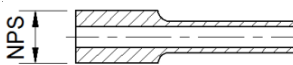
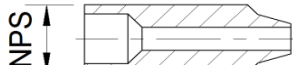



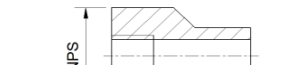

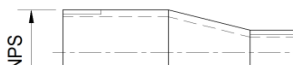


	Reducer - eccentric - concentric	as per BOQ	"DINS": Insulation Diameter "L": Linear length between edge and theoretical intersection of centerlines "IS": Insulation System "NPS": Nominal Pipe Size "NL": Number of layers		$0,5 * L * \pi * (DINS1 + DINS2)$ [m2] @ IS & NPS & NL	$0,5 * L * \pi * (DINS1 + DINS2)$ [ft2] @ IS & NPS & NL
3N Fittings (Buttweld, Socketweld and Threaded Fittings)	T-Piece - reducing - straight	as per BOQ	"DINS1": Insulation Diameter run pipe "L1": Linear length run pipe "DINS2": Insulation Diameter branch pipe "L2": Linear Length Branch Pipe "IS": Insulation System "NPS": Nominal Pipe Size "NL": Number of layers		$\pi * (L * DINS1 + 0,5 * L2 * DINS2)$ [m2] @ IS & NPS & NL	$\pi * (L * DINS1 + 0,5 * L2 * DINS2)$ [ft2] @ IS & NPS & NL
	Flanges	Weld Neck Flange (all pressure ratings)	"IT": Insulation Thickness "D_OUTS": Outside Diameter of flange face "LENGTH": Length of Flange (not length of insulation for flange!) "IS": Insulation System "NPS": Nominal Pipe Size "NL": Number of Layers		$\pi * (D\_OUTS + 2 * IT) * (2 * LENGTH + IT)$ [m2] @ IS & NPS & NL	$\pi * (D\_OUTS + 2 * IT) * (2 * LENGTH + IT)$ [ft2] @ IS & NPS & NL
	Blind Flange (all pressure ratings)	Blind Flange (all pressure ratings)	"IT": Insulation Thickness "D_OUTS": Outside Diameter of flange face "LENGTH": Length of Flange (not length of insulation for flange!) "IS": Insulation System "NPS": Nominal Pipe Size "NL": Number of Layers		$\pi * (LENGTH * (D\_OUTS + 2 * IT) + 0,25 * D\_OUTS^2)$ [m2] @ IS & NPS & NL	$\pi * (LENGTH * (D\_OUTS + 2 * IT) + 0,25 * D\_OUTS^2)$ [ft2] @ IS & NPS & NL
	Expansion Joints	Expansion joints in insulation material	Not measured	<i>Drawing only exemplary</i> 	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.

	Pipe Supports	Pipe Supports of any kind with insulation form parts (Cold Insulation)	"IS": Insulation System "NPS": Nominal Pipe Size "IT": Insulation Thickness "LENGTH": Length between outer edges of support brackets "THICK": Thickness of insulation parts	<u>Drawing only exemplary</u> 		$\pi \cdot (NPS + 2 \cdot THICK + 2 \cdot IT) \cdot (LENGTH + 2 \cdot IT) \text{ [m2] @ IS \& NPS \& IT}$	$\pi \cdot (NPS + 2 \cdot THICK + 2 \cdot IT) \cdot (LENGTH + 2 \cdot IT) \text{ [ft2] @ IS \& NPS \& IT}$
		Pipe Supports of any kind without insulation form parts (Hot Insulation) (No box required)	Not measured	<u>Drawing only exemplary</u> 	Insulation of supports will not be compensated separately as long as no box has to be installed. To be included in insulation of straight piping.	Insulation of supports will not be compensated separately as long as no box has to be installed. To be included in insulation of straight piping.	
	Half Couplings	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	

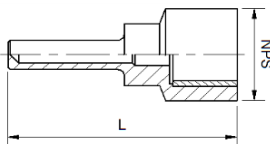
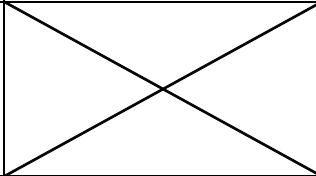
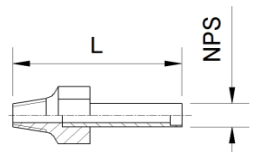
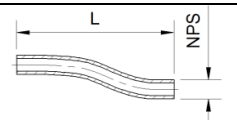
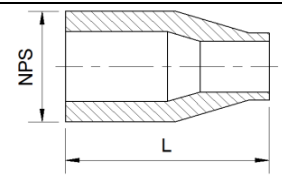
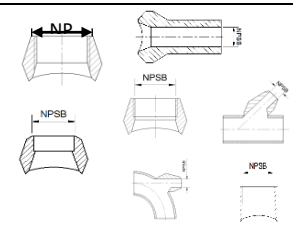
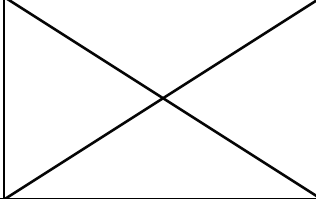
Unions for threaded, socket weld and tubing and hose connections	Couplings	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Pipe Unions (threaded and SW)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Tube Connections (e.g. Ermeto Unions, Swagelok...)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Hose Couplings (e.g. crowfoot hose couplings)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
Plugs & Bushings	Plugs	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Bushings	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation 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		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.

	Rings spacer rings, slip rings, bleed or drip rings	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Orifice Plate	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
Branches	90° Branch	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		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		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	General nozzles, nipples and attachements 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		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Deluge nozzles & spray nozzles for fire fighting systems	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	High Pressure Nozzle AB acc. LS491-11-T02	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Inclined Nozzle AD acc. LS491-11-T02	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.

Pipe  
Attachments

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



	Thermometer nozzles (acc. to LS491-08)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Threaded Sockets (acc. to LS491-08)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Pipe Nozzle for connection on threaded socket (acc. to LS491-08)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Pressure Tap Nozzle (acc. to LS491-08)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Nozzle AY acc. LS433-12 (ASME) LS433-14 (DIN/EN)	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
	Olets: - Coupolet - Elbolet - Latrolet - Thredolet - Sockolet - Nipolet - Sweepolet - Weldolet	Not measured	Not measured		Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.	Insulation of minor items not measured for compensation purposes. To be covered in insulation of straight pipes and fittings.
Heat Traced Pipe	Heat Traced pipe	Adaption of insulation to accomodate tracer lines	"DINS": Actual insulation diameter installed		Measurement follows the same principles as laid out in this document, except that for DINS the actual insulation diameter necessary for accommodation of the tracer lines will be used.	Measurement follows the same principles as laid out in this document, except that for DINS the actual insulation diameter necessary for accommodation of the tracer lines will be used.

## Insulation of Valves

Applicable for BOQ chapters

270.20.xxx - **Insulation Material**

270.1xx.20.xxx - **Insulation system** \* - Valves

270.2xx.20.xxx - **Insulation system** \* - Valves

270.3xx.20.xxx - **Insulation system** \* - Valves

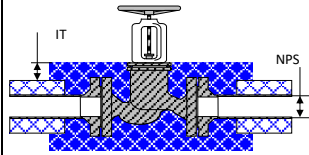
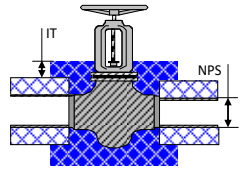
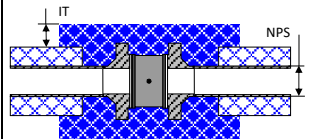
270.4xx.20.xxx - **Insulation system** \* - Valves

270.5xx.20.xxx - **Insulation system** \* - Valves

**No difference shall be made for the pressure rating of the respective valve to be insulated.**

**No difference shall be made for the number of subdivisions or compartments of an insulation box.**

**No difference shall be made whether boxes are insulated with foamed-in-situ method, pre-shaped shells or other methods**

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Drawing	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Valve Boxes	Flanged Valves (all pressure ratings)	Insulation of flange connection between valve and piping flange	"IS": Insulation System "NPS": Nominal Pipe Size "IT": Insulation Thickness		1 [pc] @ IS & NPS & IT	1 [pc] @ IS & NPS & IT
Valve Boxes	Welded valves - Buttweld - Socketweld (all pressure ratings)	as per BOQ	"IS": Insulation System "NPS": Nominal Pipe Size "IT": Insulation Thickness		1 [pc] @ IS & NPS & IT	1 [pc] @ IS & NPS & IT
Valve Boxes	Wafer Type Valve (all pressure ratings)	as per BOQ	"IS": Insulation System "NPS": Nominal Pipe Size "IT": Insulation Thickness		1 [pc] @ IS & NPS & IT	1 [pc] @ IS & NPS & IT

## Insulation of Equipment (by surface area)

Applicable for BOQ chapters

270.700.xxx.xxx - **Insulation of Equipment (by surface area)**

### Calculation of the Compensated Surface:

The diameter ("DINS") decisive for the calculation of the insulation surface for cladding (outer layer), intermediate layers and insulation layers is calculated as follows:

"DINS": Insulation Diameter

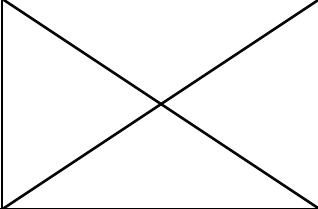
"OD": Outer Diameter of the Equipment

"IT": Insulation Thickness

$$DINS = OD + 2 \cdot IT$$

The compensated surface equals the surface area of the cladding surface without consideration of shell cut outs for nozzles, manholes, handholes, etc.

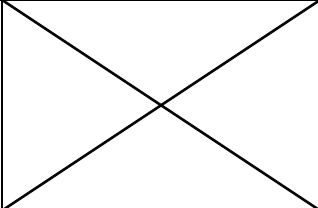
Thickness of cladding, guards, foils, vapor barrier and the like will not be considered for calculation purposes!

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Drawing	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Insulation of Equipment	Insulation of Equipment	<ul style="list-style-type: none"> <li>- cut outs, flattenings and any adaptations required for items and installation protruding from and diameter changes of the equipment shell.</li> <li>- adaptations for supports, brackets, skirts and the like</li> <li>- any additional nozzle insulation if required up to the first flange</li> </ul>	"A": Surface of the outer insulation cladding as per drawings or mechanical data sheets based on DINS "IS": Insulation System "IT": Insulation Thickness		A [m2] @ IS & IT	A [ft2] @ IS & IT

## Insulation of Equipment (Lump Sum)

Applicable for BOQ chapters


270.710.xxx.xxx - **Insulation of Equipment (Lump Sum)**

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Drawing	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Insulation of Equipment	Insulation of Equipment	<ul style="list-style-type: none"> <li>- cut outs, flattenings and any adaptations required for items and installation protruding from and diameter changes of the equipment shell.</li> <li>- adaptations for supports, brackets, skirts and the like</li> <li>- any additional nozzle insulation if required up to the first flange</li> </ul>	Lump Sum		1 [LSUM]	1 [LSUM]

[illegible]

Applicable for BOQ chapters

270.800.10.xxx - Stuffing of rockwool or mineral wool for e.g. coldbox valve partition boxes, pump casings

Category	Type of Item	Included scope in addition to BOQ (not compensated separately)	Measured dimensions	Drawing	Compensated quantity per 1 item (METRIC)	Compensated quantity per 1 item (IMPERIAL)
Special items	Stuffing of rockwool	as per BOQ	"V": Volume to be stuffed with rockwool as per drawings or specifications (NOT VOLUME OF ROCKWOOL REQUIRED)		V [m3]	V [ft3]