



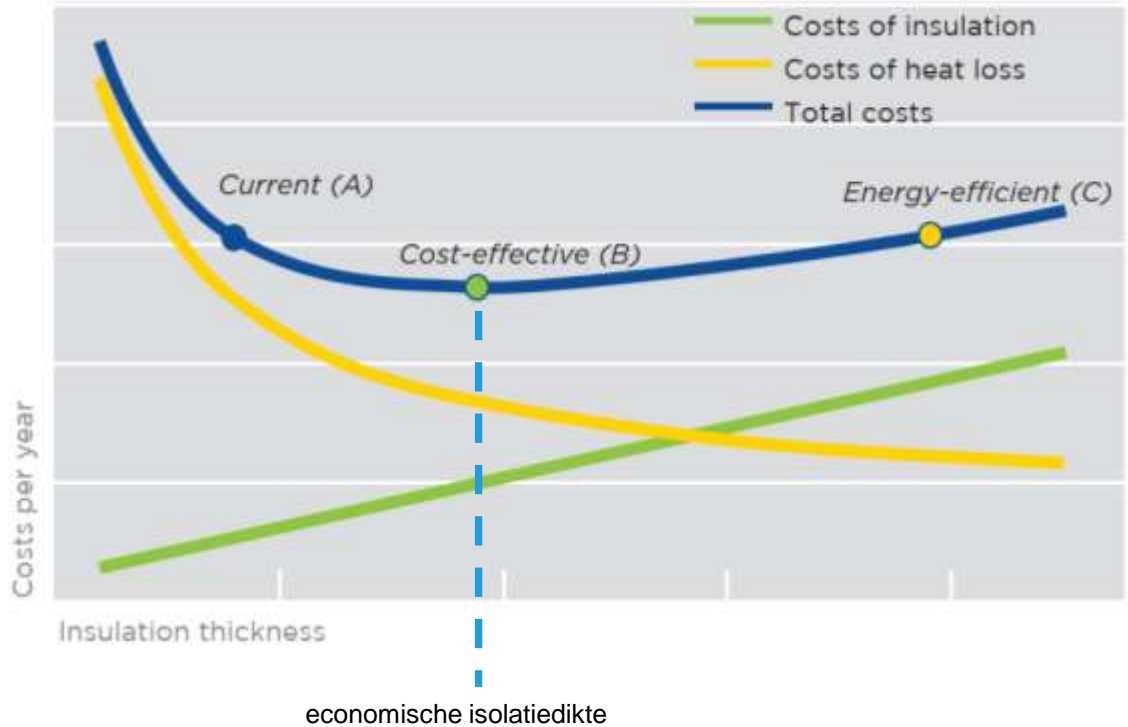
## ENERGIELABELS VOOR INDUSTRIËLE ISOLATIESYSTEMEN

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TIPCHECK Expert Level II



**ECONOMISCHE ISOLATIEDIKTE**

# ECONOMISCHE ISOLATIEDIKTE





# ENERGIELABELS

# VDI 4610 – 1 | VDI: VEREIN DEUTSCHER INGENIEURE

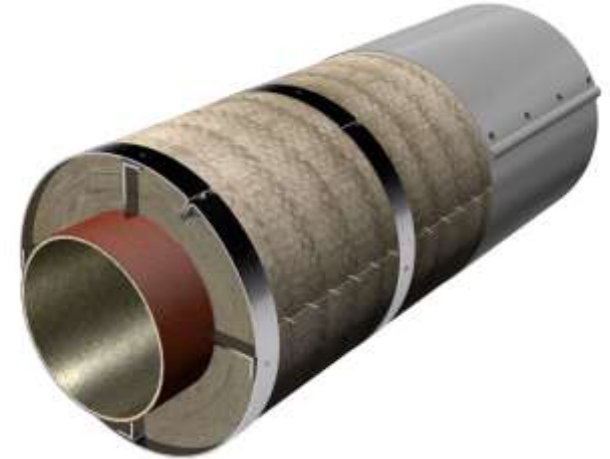
VDI 4610-1:2016-06-01 (akt. 09)		VDI-RICHTLEIHEN		January 2016 August 2016	
VEREIN DEUTSCHER INGENIEURE		Energieeffizienz betriebstechnischer Anlagen Wärme- und Kälteerzeug. Energy efficiency of industrial installations Thermal insulation		VDI 4610 Teil 1 / Part 1 Richtig Anstrichqualität Heat Insulation Quality	
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VDI-Gesellschaft Energie und Umwelt (GEEU)  
Fachverband Energieplanung und -bewertung

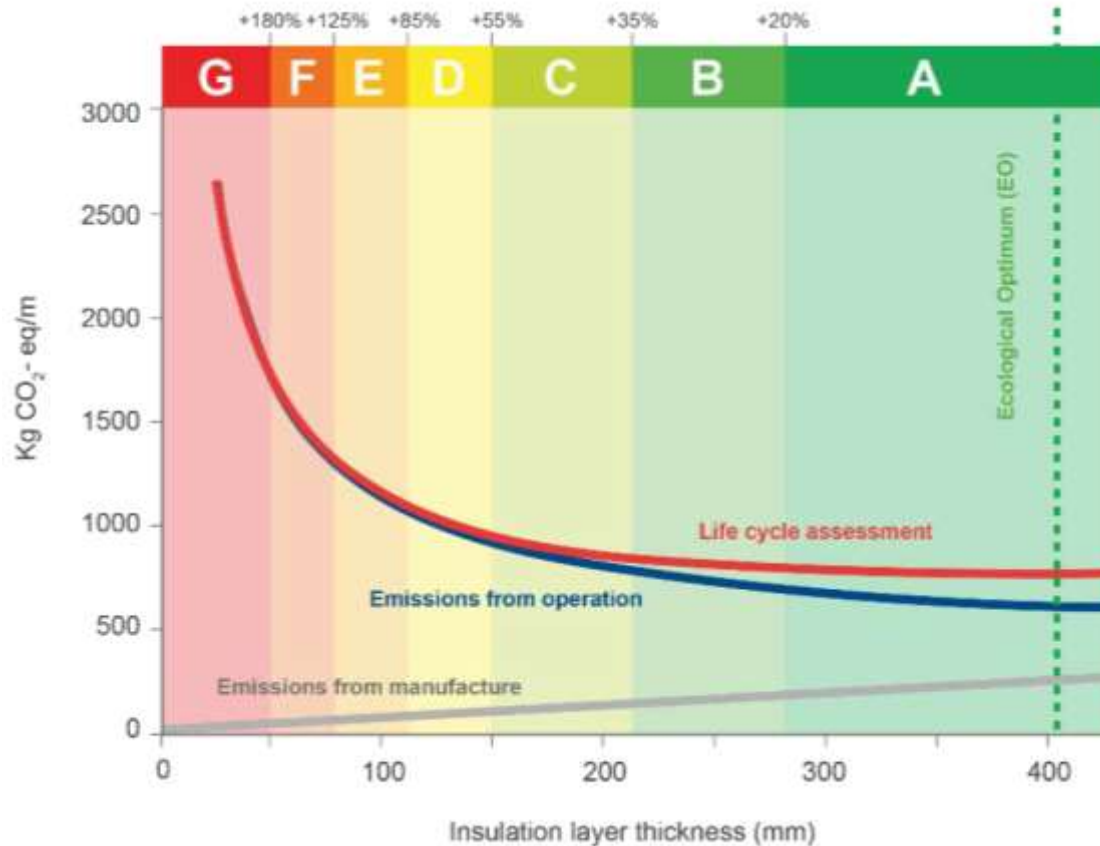
VDI-Handbuch Energietechnik  
VDI-Handbuch Ressourcenmanagement in der Umweltechnik  
VDI-Handbuch Wärme/Heiztechnik



- Ecologische isolatiedikte
- Gebaseerd op CO<sub>2</sub> emissies



# ECOLOGISCH OPTIMUM (EO)



# ENERGY EFFICIENCY CLASSES – VDI 4610-1



8.0 TABLE 8.1: HOT INSULATION THICKNESS TABLE MW

Insulating Material: Rock Wool  
 Outside Temperature: 5°C  
 Wind Velocity: 0 m/s

**HOT INSULATION THICKNESS TABLE**

Nominal diameter [mm]	Nominal R[0,01]	425	OPERATING TEMPERATURE (°C) (for Code H)										
			HOLDING TEMPERATURE (°C) (for Code SP, ETP)										
			21	151	181	201	221	261	301	401	421	501	551
16	172	35	30	40	45	50	55	60	70	80	85	95	100
20	54	35	30	40	45	50	55	60	70	80	85	95	100
25	1	35	30	40	45	50	55	60	70	80	85	95	100
30	1-1,5	35	30	40	45	50	55	60	70	80	85	95	100
35	2	35	45	50	55	75	75	80	90	100	105	110	120
40	3	35	45	50	55	65	65	70	80	90	100	110	120
100	4	35	35	40	45	55	55	60	70	80	90	100	110
150	6	45	50	55	60	65	65	70	80	90	100	110	120
200	8	45	50	55	60	70	70	75	85	95	105	115	125
250	10	50	55	60	65	75	75	80	90	100	110	120	130
300	12	45	50	55	60	70	70	75	85	95	105	115	125
350	14	45	50	55	60	70	70	75	85	95	105	115	125
400	16	50	55	60	65	75	75	80	90	100	110	120	130
450	18	50	55	60	65	75	75	80	90	100	110	120	130
500	20	50	55	60	65	75	75	80	90	100	110	120	130
550	22	50	55	60	65	75	75	80	90	100	110	120	130
600	24	50	55	60	65	75	75	80	90	100	110	120	130
700	28	50	55	60	65	75	75	80	90	100	110	120	130
750	30	50	55	60	65	75	75	80	90	100	110	120	130
800	32	50	55	60	65	75	75	80	90	100	110	120	130
900	34	50	55	60	65	75	75	80	90	100	110	120	130
1000	36	50	55	60	65	75	75	80	90	100	110	120	130

Note: Minimum insulation thickness for code A: 30 mm

Specifications for Insulation



# ENERGY EFFICIENCY CLASSES – VDI 4610-1 - ONTWERPRIJCHTLIJNEN

Warme isolatie – Bijlage B1 & B2

Koude isolatie – Bijlage C1 & C2 + D1 & D2

- Warmteverlies per label
- Isolatiedikte per label

VDI 4610 Blatt 1: Teil 1 - 01 -

Anhang II Energieeffiziente Dämmung in Wärmebereich / Annex II Energy-efficient hot insulation

Tabelle B1: Zulässige maximale Wärmeleitkoeffizienten der Energieeffizienzklassen in Wärme / Table B1: Maximum permissible heat losses per energy efficiency class, in W/m

Δt <sub>in</sub> [°C]	A	B	C	D	E	F
100	14,3	17,0	20,0	23,0	27,0	34,0
150	21,0	25,0	31,0	37,0	45,0	56,0
200	28,0	34,0	41,0	49,0	59,0	73,0
250	37,0	45,0	54,0	64,0	77,0	94,0
300	48,0	58,0	69,0	81,0	97,0	118,0
350	61,0	73,0	86,0	100,0	119,0	145,0
400	76,0	90,0	105,0	121,0	143,0	173,0
450	93,0	109,0	126,0	144,0	170,0	205,0
500	112,0	134,0	156,0	180,0	214,0	261,0
550	133,0	161,0	188,0	219,0	261,0	321,0
600	156,0	191,0	224,0	263,0	314,0	386,0
650	181,0	224,0	264,0	318,0	380,0	466,0
700	208,0	260,0	312,0	385,0	461,0	561,0
750	237,0	299,0	367,0	455,0	548,0	672,0
800	268,0	341,0	420,0	536,0	643,0	799,0
850	301,0	387,0	482,0	624,0	747,0	943,0
900	336,0	437,0	554,0	719,0	861,0	1105,0
950	373,0	491,0	636,0	822,0	986,0	1287,0
1000	412,0	549,0	728,0	934,0	1123,0	1490,0

VDI 4610 Blatt 1: Teil 1

Tabelle B2: Referenzisolationstärken (bei den Energieeffizienzklassen in Wärme) / Table B2: Reference insulation layer thicknesses per energy efficiency class, in mm

Δt <sub>in</sub> [°C]	A	B	C	D	E	F
100	20,0	27,0	35,0	43,0	53,0	67,0
150	31,0	40,0	51,0	62,0	76,0	95,0
200	43,0	55,0	69,0	83,0	101,0	125,0
250	57,0	72,0	89,0	107,0	129,0	158,0
300	73,0	91,0	111,0	133,0	160,0	197,0
350	91,0	112,0	135,0	162,0	197,0	244,0
400	111,0	135,0	161,0	195,0	239,0	297,0
450	133,0	161,0	191,0	234,0	287,0	357,0
500	157,0	191,0	224,0	280,0	343,0	425,0
550	183,0	224,0	264,0	333,0	407,0	501,0
600	211,0	260,0	312,0	394,0	480,0	595,0
650	241,0	299,0	367,0	463,0	564,0	707,0
700	273,0	341,0	420,0	540,0	659,0	837,0
750	307,0	387,0	482,0	625,0	776,0	985,0
800	343,0	437,0	554,0	719,0	905,0	1151,0
850	381,0	491,0	636,0	822,0	1047,0	1337,0
900	421,0	549,0	728,0	934,0	1203,0	1545,0
950	463,0	611,0	831,0	1056,0	1375,0	1777,0
1000	507,0	677,0	946,0	1194,0	1565,0	2035,0

Gebaseerd op generieke waarden & uitgangspunten



# PRAKTIJK



## LEIDINGWERK

- Bestaand isolatiesysteem vs nieuw isolatiesysteem

# LEIDINGWERK – CHECK BESTAANDE SITUATIE

Design data:

- Room temperature -10 up to +30 °C
- Wind speed 4 m/s
- Max. allowable jacket surface temperature 55 °C

The following table shows the required insulation layer thickness in mm:

Nominal diameter DN	Operating Temperature °C									
	50	100	150	200	250	300	350	400	450	500
15	40	40	50	60	60	70	80	80	80	
20	40	40	50	60	60	70	80	80	100	
25	40	40	50	60	60	70	90	90	100	
32	40	50	50	70	70	70	100	100	120	
40	40	50	50	70	70	70	100	100	120	
50	40	50	60	70	70	80	100	100	120	
65	40	50	60	70	70	80	100	100	150	
80	40	50	60	80	80	90	110	130	150	
100	40	50	60	80	80	100	110	130	160	
125	40	50	70	80	90	110	120	150	160	
150	40	50	70	80	100	110	130	150	160	
200	40	60	80	90	100	120	130	150	180	
250	50	60	80	100	100	120	140	170	190	
300	60	60	80	100	100	140	170	180	200	
350	60	60	80	100	100	140	170	190	200	
400	60	60	80	100	100	150	180	190	210	
500	60	80	90	100	110	160	190	210	220	
600	60	80	90	100	120	170	200	210	220	
700	60	80	90	130	140	200	200	210	220	
800	60	80	90	150	170	200	200	210	280	

## VDI 4610 ENERGY CLASSES INSULATION THICKNESS CHECK

DN	Da	50	100	150	200	250	300
25	33,7	40	40	50	60	60	70
40	48,3	40	50	50	70	70	70
50	60,3	40	40	60	70	70	80
80	88,9	40	50	60	80	80	90
100	114,3	40	50	60	80	80	100
150	168,3	40	50	70	80	90	110
200	219,1	40	60	80	90	100	120
250	273	50	60	80	100	100	120
300	323,9	60	60	80	100	100	140
350	355,6	60	60	80	100	100	140
400	406,4	60	60	80	100	100	150
500	508	60	80	90	100	110	160
600	609,6	60	80	90	100	120	170
700	711,2	60	80	90	130	140	200
750	762	60	80	90	130	140	200
800	812,8	60	80	90	130	170	200
900	914,4	80	100	110	150	190	220
1000	1016	80	100	110	150	190	220
1100	1116	100	120	130	170	200	240
1200	1219	100	120	130	170	200	240

Class EO
Class A
Class B
Class C
Class D
Class E
Class F



# LEIDINGWERK – VOORSTEL NIEUWE SITUATIE

Class B		U TECH Pipe Section MT 4.0 and U TECH Wired Mat MT 6.0 X				
		Required Insulation Thickness [mm] for Efficiency Class B at operating temperature [°C]				
DN	Diameter outside	50	100	150	200	250
25	33,7	20	30	40	50	60
40	48,3	30	40	50	60	60
50	60,3	30	50	60	70	90
80	88,9	40	60	70	90	100
100	114,3	50	70	80	100	130
125	139,7	50	70	90	120	140
150	168,3	60	80	100	120	150
200	219,1	60	90	120	150	170
250	273	70	100	140	160	180
300	323,9	60	120	150	170	190
350	355,6	90	130	160	180	200
400	406,4	90	140	160	190	210
500	508	100	150	180	210	230
600	609,6	110	160	190	220	250
700	711,2	110	160	200	230	260
Wall	--	140	200	250	290	330

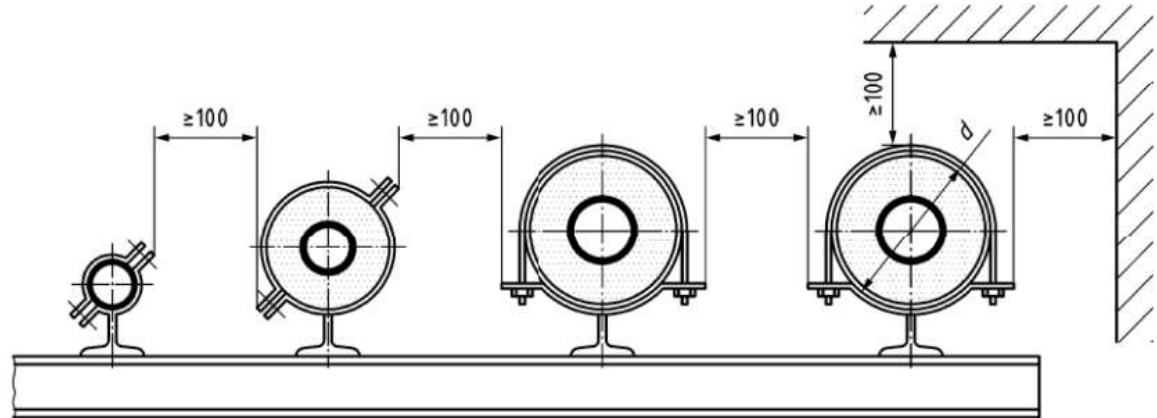
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# VOORUITBLIK

# DUITSLAND: DIN 4140 – INDUSTRIËLE INSTALLATIES

## Ontwerprichtlijnen



# DUITSLAND: DIN 4140 – INDUSTRIËLE INSTALLATIES

Update mei 2023: Tabel maximaal warmteverlies → Label C

- Minimale prestatie
- Referentie isolatiesysteem

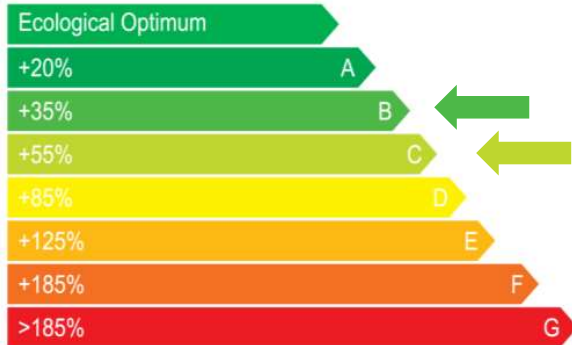


Table D.1 – Maximum heat flux density in heat insulation – Calculation according to VDI 6028 Part 1, Energy efficiency class C

DR	D <sub>u</sub> <sup>1</sup>	Maximum heat flux density for the respective ambient temperature												W <sub>ref</sub>			
		°C															
		50	100	150	200	250	300	350	400	450	500	550	600				
20	26,9	10,5	22,7	32,6	44,8	56,1	69,0	83,1	98,4	115	134	154	176				
25	33,7	10,6	22,5	32,9	45,8	58,3	71,0	86,4	102	120	139	160	182				
40	48,3	11,7	24,3	35,6	49,1	62,8	77,1	93,1	110	129	149	171	197				
55	60,3	12,4	25,7	38,7	52,1	66,5	81,5	98,1	116	136	157	181	207				
80	80,9	14,0	28,3	42,2	56,1	71,8	88,6	107	127	149	174	200	228				
100	114,3	15,4	31,8	46,9	62,9	79,8	97,0	117	138	161	187	214	245				
125	139,7	16,6	34,8	50,9	67,9	85,9	104	125	147	171	198	226	258				
150	166,3	18,0	36,3	54,0	72,1	91,1	111	133	157	183	211	241	275				
200	215,1	20,2	40,5	60,0	79,8	101	123	147	172	200	231	264	301				
250	273	22,4	44,7	65,9	87,8	110	134	160	187	217	250	286	325				
300	322,9	24,5	48,4	71,1	94,2	118	144	171	200	232	267	305	347				
350	355,6	25,7	50,6	74,3	98,2	123	149	178	208	241	277	317	359				
400	406,4	27,5	54,1	79,1	104	131	158	188	220	255	293	334	379				
500	506	31,2	62,0	88,3	119	149	179	208	241	281	323	367	415				
600	609,6	34,6	68,8	98,9	127	156	191	224	264	309	354	399	449				
700	711,2	37,9	73,8	105	134	171	204	244	284	334	379	426	481				
800	812,0	41,2	78,5	113	140	181	221	261	303	349	399	451	512				
900	914,4	44,3	84,1	121	157	199	245	277	321	370	423	480	541				
1000	1016	47,4	89,4	128	167	211	260	292	340	391	446	505	569				
1200	1219,2	53,5	100	143	185	229	274	322	374	427	487	555	623				
ref	120	72,9	71,7	99,8	88,8	98,6	85,6	74,9	84,0	95,1	106	118	W <sub>ref</sub>				

NOTE 1: The maximum heat flux density is verified using the reduction procedure specified in VDI 6028 Part 2 and considering the actual insulation system together with the mean values of the actual ambient conditions (temperature and wind speed) and the required space ring and supporting structures.  
NOTE 2: Higher values prescribed for the heat flux density, e.g. by customer specifications, shall be checked separately.  
NOTE 3: In addition to VDI 6028 Part 1, the heat flux densities of this table are rounded to 1 significant digit.  
1: Mean diameter of the pipes

Table D.2 – Insulation thicknesses in heat insulation, in mm, verification based on reference insulation materials – Calculation according to VDI 6010 Part 1, Energy efficiency class C

DR	D <sub>u</sub> <sup>1</sup>	Insulation thicknesses [mm] for a medium temperature (°C)											
		50	100	150	200	250	300	350	400	450	500	600	
20	26,9	38	40	50	60	66	78	83	83	90	96	106	118
25	33,7	40	50	60	70	78	88	98	98	109	119	129	138
40	48,3	48	60	70	80	90	100	110	120	130	140	150	160
55	60,3	58	70	80	90	100	110	120	130	140	150	160	170
80	80,9	66	80	100	120	120	130	140	150	160	170	180	190
100	114,3	76	90	110	130	130	150	160	170	180	190	200	210
125	139,7	78	100	120	130	150	160	170	180	190	200	210	220
150	166,3	88	110	130	140	160	170	180	190	200	210	220	230
200	215,1	98	120	140	160	180	190	210	220	230	240	250	260
250	273	98	130	150	170	190	210	220	240	250	270	290	300
300	322,9	100	140	160	180	200	220	240	260	270	290	310	320
350	355,6	100	140	170	190	210	230	250	270	290	310	330	340
400	406,4	110	150	180	200	220	240	260	280	300	320	340	350
500	506	110	160	190	220	250	280	300	320	340	360	380	390
600	609,6	120	170	200	230	260	300	320	340	360	380	400	410
700	711,2	120	180	210	240	270	310	330	350	370	390	410	420
800	814,4	120	180	220	250	280	320	340	360	380	400	420	430
900	916	140	200	240	270	300	330	350	370	390	410	430	440
1000	1016	140	200	240	270	300	330	350	370	390	410	430	440
1200	1219,2	150	210	250	280	310	340	360	380	400	420	440	450
ref	120	210	220	290	220	230	300	400	400	400	400	400	400

NOTE 1: Additional requirements, such as regarding the maximum surface temperature, shall be verified separately.  
NOTE 2: In addition to VDI 6010 Part 1, the insulation thicknesses of this table are rounded up to the nearest 10.  
1: Mean diameter of the pipes

- Duitsland heeft subsidie regeling obv label B



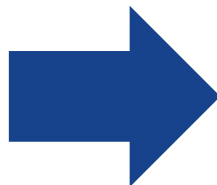
# NIEUWE EUROPESE STANDAARD

prEN 17956 – 2024

VDI 4610

Blatt 1 / Part 1

Energy efficiency of industrial installations  
Thermal insulation



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

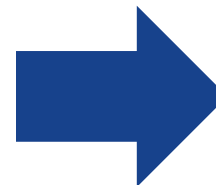
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**prEN 17956**

February 2023

ICS 91.120.10

English Version

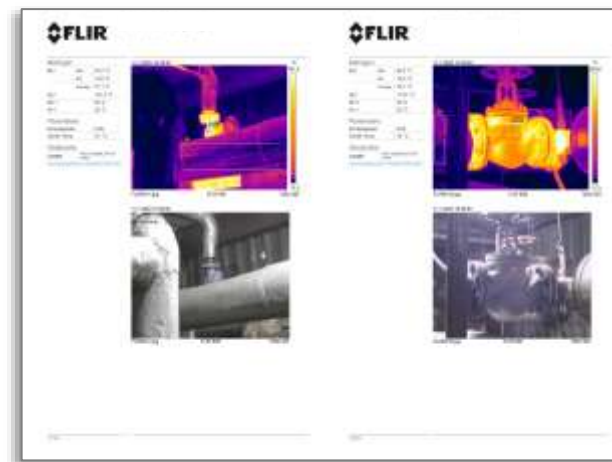
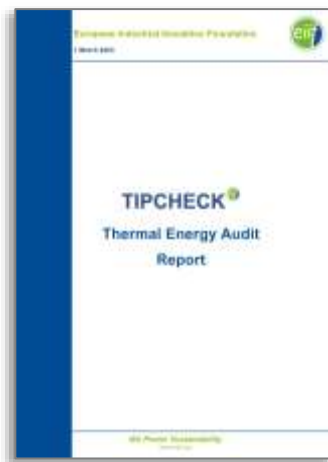
Heating systems and water based cooling systems in  
buildings - Energy efficiency classes for technical  
insulation systems - Calculation method and applications



# EIF - TIPCHECK

Verbeteren van bestaande isolatiesystemen

- Energielabels in calculatiesoftware
- Online calculator



# SAINT-GOBAIN ISOLATIE SPECIFICATIE

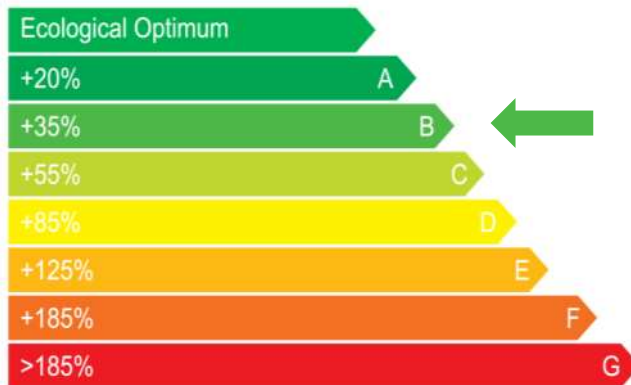
Ecologische thermische isolatie – gebaseerd op CO<sub>2</sub> reductie



For selecting the **insulation thickness** four insulation definition classes must be considered for each case:

## 4.1.1. Ecological thermal insulation (EI)

Insulation thicknesses shall be chosen for meeting the conditions established in VDI 4610 – part 1 as Ecological Class **B**. In Appendix II some examples for different products are provided. If a different product than the ones described in the Appendix II would be used, a new thickness calculation must be provided for the selected product in accordance with Ecological Class **B**.



**WEBINAR 30 MEI 2024 – 11.00 UUR**



Webinar  
**Energielabels in  
de industrie**

**do 30 mei 2024**  
11.00 tot 11.45 uur

**GRATIS AANMELDEN**

