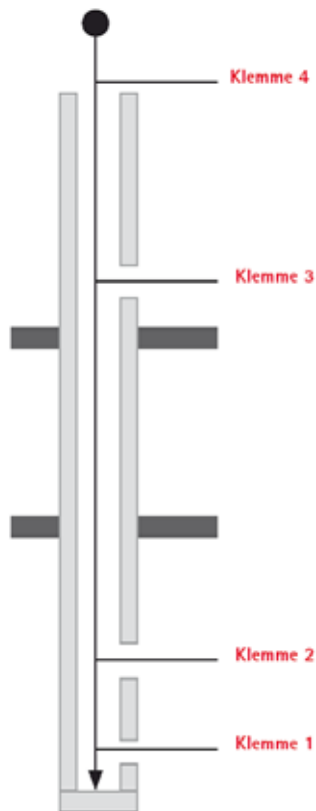


Monteringsvejledning stålforing Darco

Produktbeskrivelse:	Darco SWK Fast enkeltvægget element stålforingssystem. Beregnet for renovering af eksisterende skorsten.
Brændsel:	Fast brændsel, olie og piller.
Notified Body nr: 1450	1450
CPR nr: 0007	0007
DOP nr: 1/2017	1/2017
CE designationskode:	PN-EN 1856-2: 2009. T450-N1-W-Vm-L50060-G500 (L50060 ved diameter Ø150mm) (L50050 ved diameter Ø100mm og Ø130mm) Korrisionsmærket (Vm) i henhold til Bygningreglementet, ved anvendelse af materiale type L50.
Sodildtestet:	Ja
Materialekvalitet:	1.4404 (aisi 316L)
Materialetykkelse:	0,5mm ved Ø100 og Ø130mm. 0,6mm ved Ø150mm.
Svejsning:	WIG
Anvendelsesområder:	Undertryk Tør drift (sodildtestet til 1000 °C) Våd drift (kondenserende)
Drifttemperatur:	400°C
Samlinger:	Muffe/ Nippel
Varmeledningsmodstand:	0,0 m ² K/W ved 450°C
Gennemstrømningsmodstand:	Se DOP
Ruhed:	R = 0,001(m)
Frost/tø bestandig:	Ja
Isolering:	Ja, såfremt afkøling er kraftig kan det monteres. Isoleringsskål er 25mm tyk og 1000 mm lang.
Producent:	Darco Sp. Z O.O., 39-200 Debica, ul. Metalowcow 43, Poland
Importør:	TermaTech A/S DK-8260 Viby Tel: +45 8742 0035 Fax: +45 8742 0036 www.termatech.com

Monteringsvejledning stålforing Darco

1

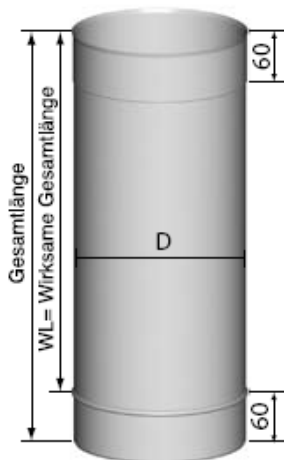


Forberedelse af arbejdet - Hvordan renoverer man skorstenen?

Formål:

- Formålet med at montere en stålforing er, at forbedre trækket i den eksisterende skorsten og/eller at undgå kondensproblemer.
- En stålforing bruger kun cirka 1/20 del varmeenergi på at blive varm i forhold til en element skorsten. Det betyder at stålforingen bliver meget hurtigere varm end elementskorstenen, hvorved trækket i skorstenen etableres hurtigt – dette er specielt en fordel ved brændeovne og pejseindsatse, som ofte har problemer med trækket i opstartsfasen.
- De moderne og miljøvenlige brændeovne og pejseindsatse afgiver koldere røg end tidligere, da det er ensbetydende med højere virkningsgrad. Det betyder dog også, at temperaturen i skorstenen derved bliver lavere, hvorved trækket formindskes. Moderne og miljøvenlige brændeovne og pejseindsatse kræver således et højere træk for at fungere efter hensigten.

2



- Moderne byggemetoder med meget tætte bygninger bevirker, at det ofte er nødvendigt at installere ekstern forbrændingsluft tilslutning til brændeovne og pejseindsatse. Det betyder at forbrændingsluften skal suges igennem en slange, inden det når selv brændkammeret. Den øgede modstand der derved er skabt i luftens vej igennem brændeovn og skorsten kræver et højere træk fra skorstenen end tidligere. For at skorstenen kan trække forbrændingsluften igennem ovnen og videre ud i skorstenen, kræves at skorstenen er varm – en stålforing bruger kun cirka 1/20 del varmeenergi på at blive varm i forhold til en element skorsten.

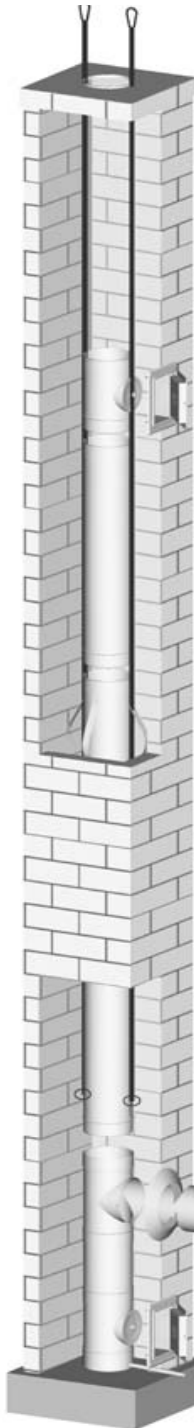
3



- Røgen fra moderne oliefyr og kedler er meget koldere end tidligere. Derfor opstår der ofte problemer med kondens i skorstenen. Kondens medfører fugtudtrækning igennem vægge etc. Eneste løsning herpå er, at montere en stålforing med kondens afløb. Elementskorstene kan ikke forhindre kondensdannelsen, idet røgen er så kold at den ikke kan opvarme skorstenen. Kondensat vil altså optræde uanset skorsten, og dette kondensat skal ledes bort fra skorstenen.

Monteringsvejledning stålforing Darco

4



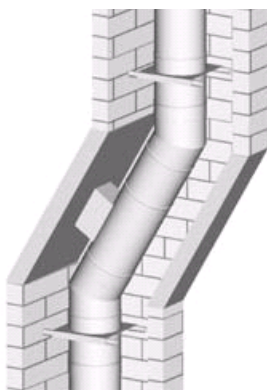
Udmåling:

- Sænk en loddesnor fra toppen af den eksisterende skorsten til bunden af skorstenen.
- Marker eksisterende åbninger i skorstenenvha. klemmer på loddesnoren. (Se billede 1)
- Udlæg loddesnoren vandret.
- Saml den komplette stålforing ved siden af loddesnoren.
- Vær opmærksom på nyttelængden og retningen af samlingerne (Se billede 2 og 3 – hver samling tager 6 cm af nyttelængden).

Montering: (Se billede 4 og 5)

- Skær den nøjagtige længde af, der skal være imellem nederste inspektions- og renselem og selve T-stykket der går imod kedlen/fyret/brændeovnen.
- Placer kondensskålen i bunden af den eksisterende skorsten.
- Nedsæk nu stålforingen. Begynd med inspektions- og renselem.
- Monter herefter rør for rør, samtidigt med at foringen nedsækkes. Vær opmærksom på, at muffen vender opad hele tiden.
- For hver 5 mtr. monteres en længdesektion med afstandsholder. Bøj afstandsholderne så de passer til den eksisterende skorstens mål, således foringen centrereres.
- Det sidste længdeelement afkortes således, at der pr. stigende meter beregnes 2-8mm til længdeudvidelse. Herved kan stålforingen udligne varmeudvidelsen i afdækningspladen. Dvs. 5 meter stålforing = 10-40mm afkortning af det sidste længdeelement, så det kan bevæge sig frit op og ned.

5



6

Specielle forhold:

- Ved store skorstens lysninger, kan der monteres isolering omkring stålforingen for at undgå kraftig nedkøling. Herved kan kondensering formindskes. Isolering skåle er 25mm tyk 1000 mm lang.
- Stålforingen må kun føres skråt én gang. skråt føringen skal være forsvarligt understøttet, og der skal være rens mulighed. Ved skrå montering må vinklen på bøjningerne ikke overstige 30° (Se billede 6).

Monteringsvejledning stålforing Darco

Mounting Instruction

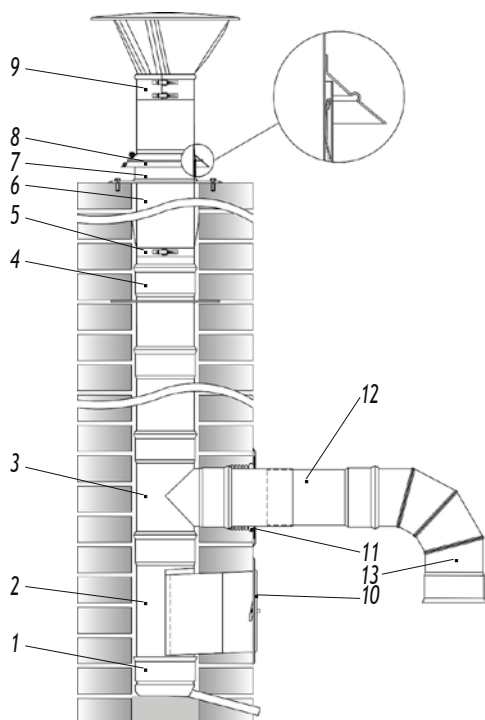
SWK, SWKZ chimney liners

Usage:

SWK chimney liner is a single walled system of flue ducts made with 1.4404 stainless steel. It is designed to be used with heating devices (excluding solid fuels based on coal) operating with negative pressure working both in dry and wet (condensation) conditions. It is also designed to be used as an insert for existing ceramic chimneys or newly-built brick chimneys. Maximum flue gas temperature is 450°C.

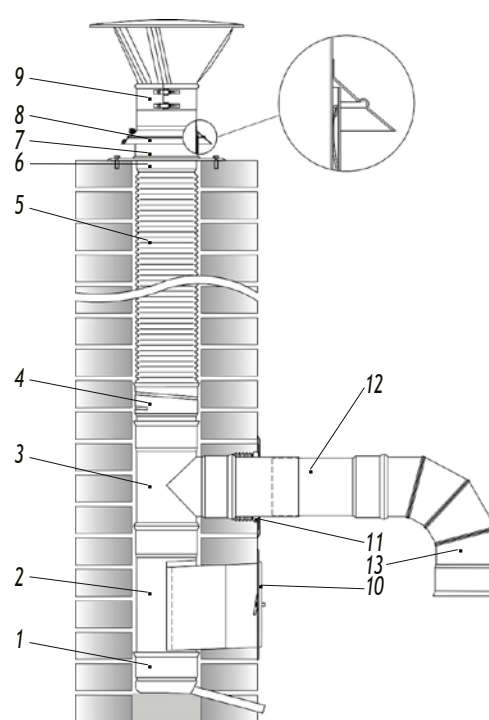
SWKZ Heat-Resistant chimney liner is a single walled system of flue ducts made with 1.4828 heat-resistant steel. It is designed to be used with solid fuel (wood) burning appliance operating with negative pressure working both in dry and wet (condensation) conditions. It is also designed to be used as an insert for existing ceramic chimneys or newly-built brick chimneys. Maximum flue gas temperature is 600°C.

Example installations:



Pos	Name	Denotation
1	Condensate drain bowl	MS150-CH
2	Clean out of element	MS150-CH
3	Tee 90°C	TR150/90-CH6
4	Intermediate support	PP150-CH6
5	Stabilizing bracket	OU150-CH
6	Straight pipe	RP150/1000-CH6
7	Roof plate	PD150-X
8	Rain collar	KPD150-X
9	Rain cap	DK150-CH6
10	Inspection door	DW125X185
11	Rosette	ROZ150-H17
12	Telescopic pipe	RT150/2X250-CH6
13	Adjustable air-tight elbow 0-90°C	KNU150/90-CH6

Fig. 1. Example of a SWK type single walled chimney liner (rigid pipes).



Pos	Name	Denotation
1	Condensate drain bowl	MS150-CH
2	Clean out of element	WC150-CH6
3	Tee 90°C	TR150/90-CH6
4	Bell-type joint for flex pipe	ZST150-CH6-K
5	Flexible stainless pipe	RESF 150-CH
6	Spigot-type joint for flex pipe	ZST150/150-CH6-N
7	Roof plate	PD150-X
8	Rain collar	KPD150-CH
9	Rain cap	DK150-CH6
10	Inspection door	DW125X185
11	Rosette	ROZ150-H17
12	Telescopic pipe	RT150/2X250-CH6
13	Adjustable air-tight elbow 0-90°C	KNU150/90-CH6

Fig. 2. Example of a SWK type single walled chimney liner (flexible pipes).

Picture:



Mounting Instruction

SWK, SWKZ chimney liners

Mounting guidelines:

1. Before mounting the chimney and choosing necessary construction equipment, construction law, appropriate standards and safety regulations valid in the given country must be studied and obeyed.
2. Determine parameters of the new chimney: its diameter and height as well as length of part connecting boiler with the chimney. <It is always needed to take producers recommendations into account>.
3. Before mounting SWK, SWKZ chimney system it is necessary to clean the inner side of chimney from loose ceramic parts and excess of combustion products (f.e. soot).
4. Check if the cross-section of existing chimney is suitable to fit the <SWK> elements in the whole height of the chimney (for example by using 1m long pipe of the same diameter and checking if it will go all the way through).
5. Before mounting the SWK or SWKZ system, it is necessary to determine the number and locations of clean out elements and 90 or 45° tees. Positioning of the boiler needs to be taken into account. Minimal inclination of the connecting section from the boiler to chimney is 3°. Number and location of inspection elements should be consulted with a chimney sweep.
6. It is needed to keep proper distance to flammable materials. In case the SWK, SWKZ elements are passing through walls which are made of combustible materials and this distance cannot be kept, these walls need to be covered with non-combustible durable construction material (at size of at least 500 mm) of low thermal conductivity (e.g. lightweight concrete). Alternatively, this can be solved by making a shield pipe made of non-combustible durable construction material or by using additional insulation. When mounting the chimney to the wall, clearance of at least 500 mm between the chimney and flammable construction elements should be kept.
7. SWK and SWKZ systems (fig.1 and 2) – Static designing parameters: Maximum chimney height $H = 10$ m. When $H > 10$ m, intermediate supports (at least every 10 m) need to be applied – so that they carry the load of a chimney. On top of chimney liner a chimney ending should be placed – a cap. Chimney cowls (e.g. Rotowent, Dragon) can be mounted instead of the cap – in order to stabilize and increase chimney draught.
8. OU stabilizing brackets (fig.1 and 2) – approximately every two meters, a stabilizing bracket should be applied in order to make sure chimney liner is in the axis of the duct.
9. Condensate extraction – it is necessary to provide condensate and rainwater extraction to the drainage. Also, a siphon for condensate with a water level of at least 10 cm should be applied. Such a siphon needs to be inspected and cleaned on regular basis. Condensate can be extracted through the boiler, but only if it is suitable for this. With installations placed outside, securing against icing should be considered (for example by using a heating wire in the bowl).
10. Boiler-room must not be located in close neighborhood with rooms where fluorine or chlorine compounds are stored (for example hairdresser's shops, laundries, chemical products warehouses).
11. Chimney should be built in a way that it reaches above the roof level. Precise information on distances (from roof covering, obstacles etc.) should be specified in regulations valid for given country. Chimney outlet should be located in a way that wind blowing will not interfere the chimney draught.
12. Make sure periodic chimney sweeping and inspections according to relevant law regulations are performed. Increase their frequency, if necessary.

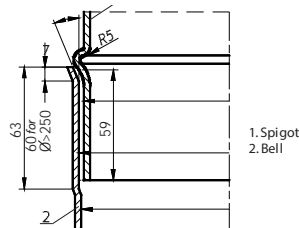


Fig. 3. Method of joining single-walled pipe elements.

Guidance notes for installers::

1. Chimney should be installed only by a trained installation crew, authorized by the manufacturer. When installing safety regulations should be strictly kept, chimney elements are made of thin metal sheet and may have sharp edges. When installation is complete, remove the protecting foil.
2. After the installation is finished, chimney must be inspected by a qualified chimney sweep. Such inspection should be documented with a proper certificate.
3. Special features of chimney system elements (fig. 3) – Each pipe has its upper and lower end. It consists of a bell and a spigot. The spigot ended side is equipped with additional rim to facilitate connection. **All elements of a chimney liner should be mounted by pushing the end with rim into the bell, always bell-side up (to assure proper flow of condensate).**
4. Holes should be made in the lower side of ceramic chimney, so to help to install key elements of a chimney liner (clean out element, tee) as well in places where additional revision fittings are to be installed. Holes should be made also in places that are not vertical or if there is an obstruction in the duct. Solid base inside the duct should be made, so that the liner is placed on a rigid surface.
5. Centered in the axis of a chimney duct, starting from the bottom following elements should be placed: [MS] bowl with clean out element [WC], pipe section [RP] connecting the clean out element with [TR] tee.
6. Pipe elements [RP] have to be placed in chimney duct from the top. At first, pipe with mounting brackets [RU] should be put into the chimney. To this [RU] pipe, cords of proper length and resistance are to be fixed. This pipe needs to be held at the height, where next pipe will be possible to mount. After mounting the second pipe, cords needs to be pulled down so that the next pipe can be mounted. Following this method, all pipes shall be placed until the moment when first pipe connects with [TR] tee.
7. In case of using [KN] adjustable elbows, after determining the proper angle, all segments should be sealed with high temperature silicone:
 - before mounting in the installation - inside the elbow,
 - after mounting in the installation - outside the elbow.**Another method is to use the [KNU] adjustable air-tight elbows.**
8. Overall length of [RP] pipes should be determined so that the upper edge of chimney liner is higher than ceramic chimney cap.
9. On the top part of a chimney - [PD] roof plate with [KPD] rain collar should be mounted, as well as [DK] cap protecting from rainwater.
10. In the [WC] clean out element, cleaning doors should be mounted. In case the wall is very thick, a [PW] extension can be applied. To mount the door in a concrete wall, an additional [RM-DW] frame should be used.
11. Cover up all previously made holes in the chimney duct. Make sure mortar is not in contact with elements of chimney liner. Use mineral wool as separator between [WC] clean out element, [MS] bowl, [TR] tee and chimney wall.
12. Marking: fill out and stick the proper chimney information plate, preferably on the inspection door.

Monteringsvejledning stålforing Darco

Mounting Instruction

SWK, SWKZ chimney liners

SWK-type single-walled acid-resistant chimney system technical specification:

DN diameter	80	100	110	120	130	140	150	160	180	200	225	250	280	300	350	400	450	500
Inner pipe diameter [mm]:	79,1	99,8	110,9	122,0	131,6	139,5	150,6	160,2	180,8	199,9	225,4	250,7	279,3	300,0	349,3	400,1	449,4	500,3
Material type:	1.4404																	
Wall thickness [mm]:	0,5	0,5	0,5	0,5	0,5	0,6	0,6	0,6	0,6	0,6	0,6	0,8	0,8	0,8	0,8	1,0	1,0	1,0
Pipe cross-section [cm ²]:	49,1	78,2	96,5	116,8	136,0	152,8	178,0	201,5	256,6	313,7	398,8	493,4	612,4	706,5	957,8	1256,6	1589,6	1962,5
Design load [N/running meter]:	10,0	12,6	14,0	15,4	16,6	21,1	22,8	24,2	27,3	30,2	34,1	50,5	56,3	60,4	70,4	100,8	113,3	125,9
Type of fuel:	Gas/oil																	
Working conditions (pressure):	negative pressure (N1)						Corrosion resistance:						Vm					
Maximal working temperature:	450°C (T450)						Support spacing:						10 running meters					
Condensate resistance:	wet (W)						Sootfire resistance:						resistant (G)					
Distance to combustible materials:	500 mm																	

Product marking by Darco Sp. z o.o.

DARCO RP130/1000-CH5 PN EN1856-2:2009 T450 N1 W VmL50XXX G 500

Harmonized norm No	PN EN1856-2:2009
Temperature class	T450
Pressure class (negative N1)	N1
Condensate resistance (W: wet)	W
Corrosion resistance (flue liner material type and thickness)	VmL50XXX
1.4404 stainless steel, flue liner thicknesses from 0,5 to 1,0 mm	
Sootfire resistance (G: resistant)	G
Distance to combustible materials (500 mm)	500

Monteringsvejledning stålforing Darco

DECLARATION OF PERFORMANCE no 1/2017



06 1450

1. Unique identification code of the product-type: **SWK – single-walled acid-resistant chimney system.**
2. Intended usage of the construction product: **SWK – type chimney liner system – made of acid-resistant steel sheet, used as a protection of inner walls of ceramic chimney duct exhausting wet fumes from oil, gas or pellet burning devices.**
3. Manufacturer:



DARCO Sp. z o. o.
39-200 Dębica,
ul. Metalowców 43, Poland

4. System or systems of assessment and verification of constancy of performance of construction product: **2+**
5. Harmonized norm: **PN-EN 1856-2:2009**
Notified body no: **UE nr 1450**
Instytut Nafty i Gazu, Państwowy Instytut Badawczy
ul. Lubiesz 25a, 31-503 Kraków

6. Declared performance:

No.	Essential characteristics	Performance	Harmonised technical specification
1.	Temperature class	T450	PN-EN 1856-2:2009
2.	Gas tightness (pressure class)	N1 (40[Pa])	PN-EN 1856-2:2009
3.	Condensate penetration resistance	W	PN-EN 1856-2:2009
4.	Resistance against chemicals	Resistant	PN-EN 1856-2:2009
5.	Resistance against corrosion	Vm	PN-EN 1856-2:2009
6.	Sootfire resistance	G	PN-EN 1856-2:2009
7.	Minimum distance to combustible materials	500 [mm]	PN-EN 1856-2:2009
8.	Thermal resistance	0 [m²K/W] without isolation	PN-EN 1856-2:2009
9.	Flow resistance coefficient [ζ]	Tee 90° - 1,14 Tee 45° - 0,35 Elbow 90° - 0,40 Elbow 45° - 0,28 Elbow 30° - 0,20	PN-EN 1856-2:2009
10.	Roughness value	R = 0,001[m]	PN-EN 1856-2:2009
11.	Compressive strength	Pass	PN-EN 1856-2:2009
12.	Freeze thaw resistance	Resistant	PN-EN 1856-2:2009
13.	Tensile strength	NPD	PN-EN 1856-2:2009

Performance of the product is in conformity with above declared values. This declaration of performance is issued in accordance with (EU) regulation no 305/2011, under the sole responsibility of the above identified manufacturer.

Declaration of performance concerns products produced from 01.07.2013

Signed for of the manufacturer by: **Lukasz Darlak – Vice-president**

Dębica 03.07.2017
(place and date of issue)

DARCO Sp. z o.o.
ul. Metalowców 43, 39-200 Dębica
NIP 872-21-77-114
REGON 691758322; KRS 0000170668
ŁD

WICEPREZES ZARZĄDU

(signature)



Darco Sp. z o.o. 39-200 Dębica, ul. Metalowców 43, Polska
tel. +48 14 680 90 00, fax 14 680 90 01, e-mail: darco@darco.com.pl


NIP 872 21 77 114 | REGON 691758022 | KRS 170668 | Kapitał zakładowy: 800 000 PLN
Bank PBS: 06 8642 1139 2013 3900 0749 0001

www.darco.com.pl

Monteringsvejledning stålforing Darco

CE Stålføringsmærkat

Det vedlagte CE stålføringsmærkat skal udfyldes med installationsdato og montør. Mærkatet skal påsættes et synligt sted på stålforingen, eller opbevares af ejer således at det kan fremvises på forlangende.

TermaTech Stålforing Darco (DN 80-600)		
DS/EN 1856-2		
Darco System SWK	T450-N1-W-Vm*-L50050-G500	
Darco System SWK	T450-N1-W-Vm*-L50060-G500	
Installatør: _____ Installations dato: _____		
Adresse installatør: _____		
TermaTech A/S, Gunnar Clausens Vej 36, DK 8260 Viby J		
*Er korrisionsmærket i henhold til bygningsreglementet ved anvendelse af materiale type L50.		
		 System SWK Single walled acid resista chimney system 1450-CPR-0007