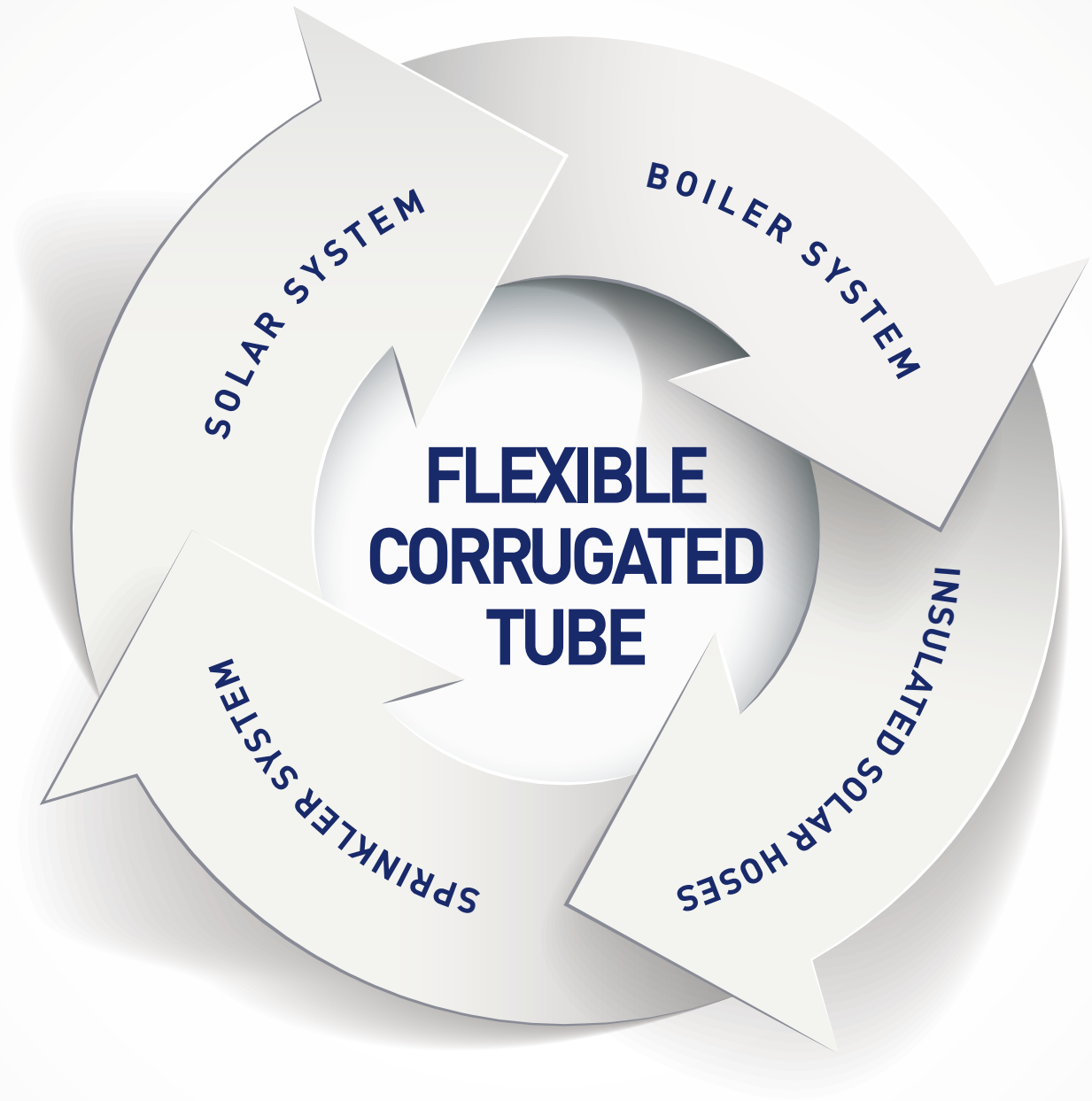


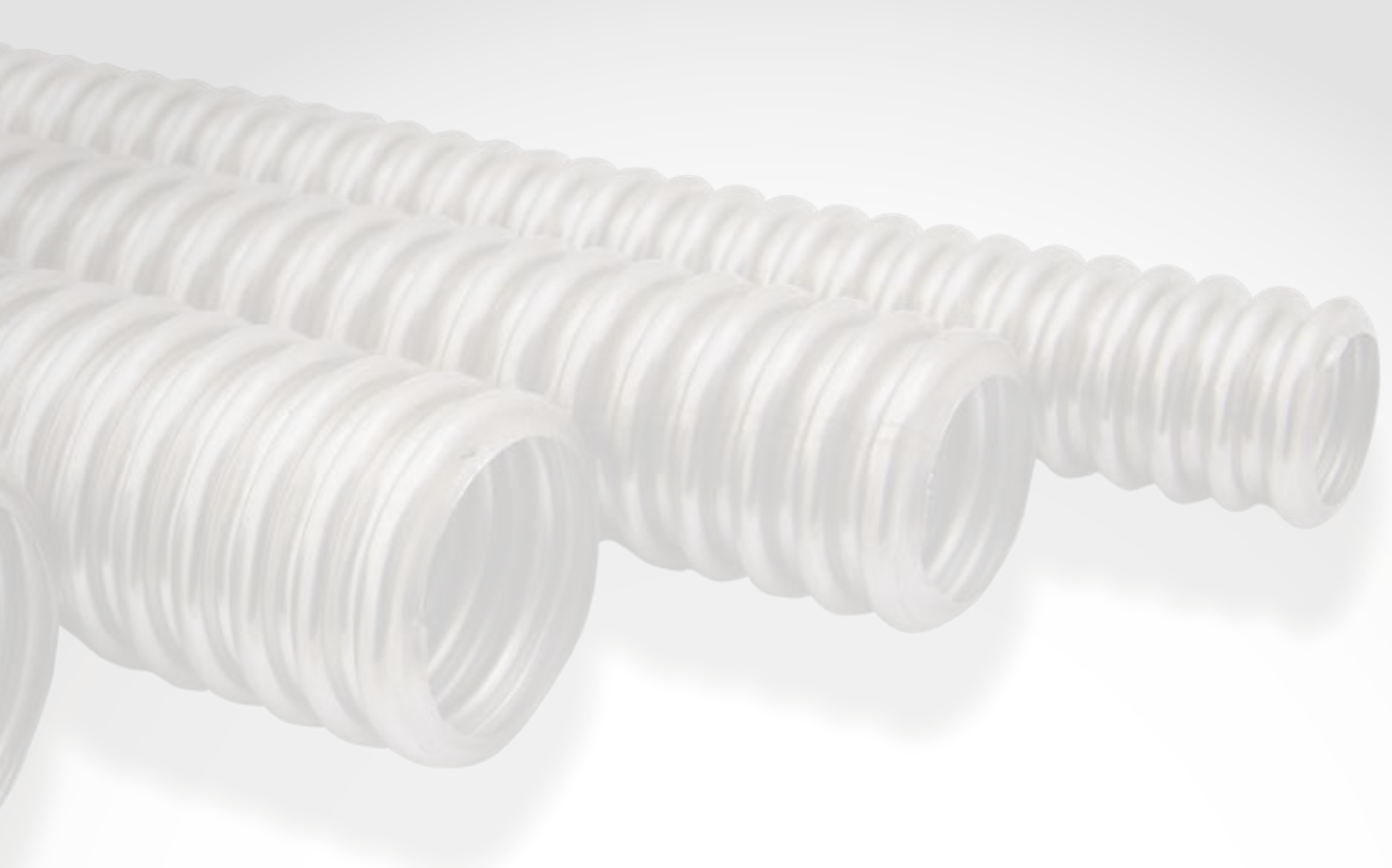
*Back To The Nature*



**KAS<sup>®</sup>**

w w w . k a s . c o m . t r





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# **SOLAR** SYSTEM

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**KAS<sup>®</sup>**

## System Definition of Corrugated Flexible Hoses in Solar Industry

In recognition of transfer of solar energy via metallic flexible hoses, day by day, corrugated flexible hoses have been becoming one of the alternative ways for the users in the World. As indicated in the successful results, corrugated flexible hoses have turned into a main formula in the solar industry. Stainless Steel with the quality AISI 316L operated in heat transfers supplies many advantages.

Quick Coupling System enables easier connection among the parts; whereby, the items are locked without any welding procedure or any other union parts and the system enables tightness between the metallic parts; in this regard, Quick Coupling System, developed in KAS laboratory by Research & Development Department, has become the solution in many countries in the world, especially in Europe

### Advantages;

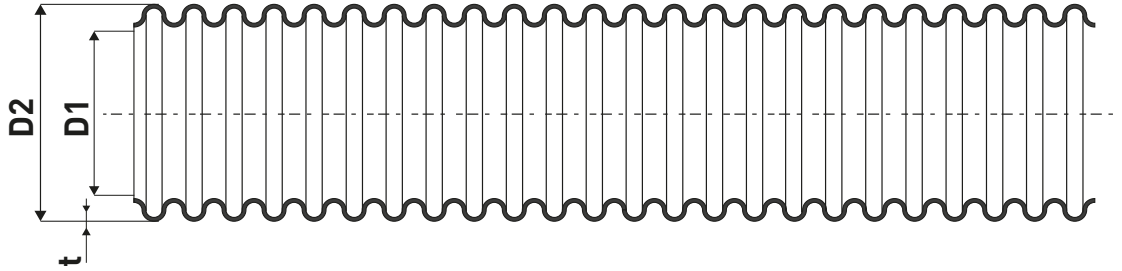
The heat rate is high and the system reacts faster ( m<sup>2</sup>/m)

The helistic pitch prevents lime and corrosion

High Water-Carrying Capacity

Easy installation due to its lightness

## Technical Specifications of KAS Flexible Stainless Steel Solar Flex



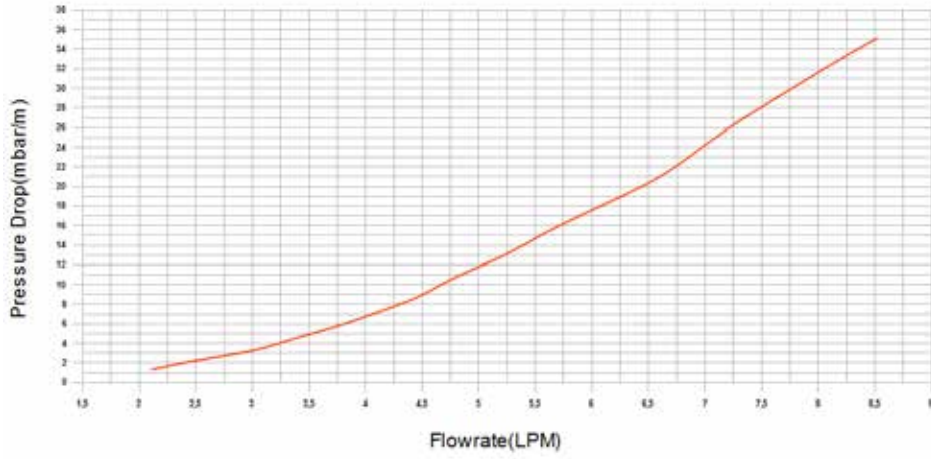
DN	Outer Diameter (D2) mm	Internal Diameter (D1) mm	Material Thickness (t) mm	Material	Weight ( %10 ± ) (gr / m)	Surface ( %5 ± ) (m <sup>2</sup> / m)	Volume ( %5 ± ) (dm <sup>3</sup> / m)	Corrugation per 100 mm	Bend Radius (Static) r min (mm)	Working Pressure 20 °C (bar)	Nominal Pressure DIN EN ISO 10380 (Pn)	Code
16	Ø21,3 ±0,2	Ø16,2 ±0,2	0,18	AISI 31 6L	142	0,0949	0,2728	22	25	16	16	04.16.316
20	Ø26,4 ±0,2	Ø20,9 ±0,2	0,18	AISI 31 6L	185	0,1446	0,4271	21	30	10	10	04.20.316
25	Ø31,2 ±0,4	Ø25,3 ±0,3	0,2	AISI 31 6L	245	0,1586	0,6335	19	35	10	10	04.25.316

## FLEXIBLE ELASTOMERIC FOAM

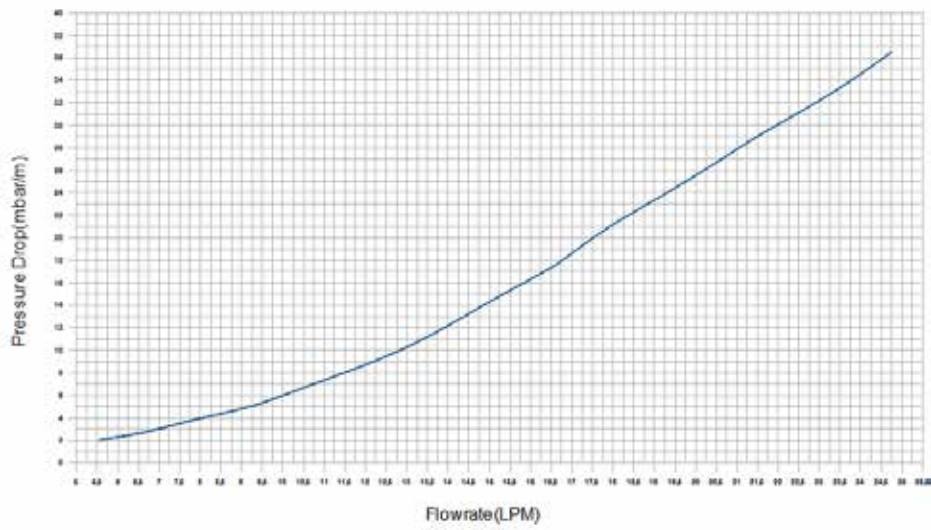
Temperature range	- 50°C to + 150°C
Thermal conductivity $\lambda$ W / ( m <sup>2</sup> ·K )	20°C 0,0040 W (m.K) 40°C 0,0042 W (m.K) 60°C 0,0045 W (m.K)

# FLEXIBLE PRESSURE LOSS CHART

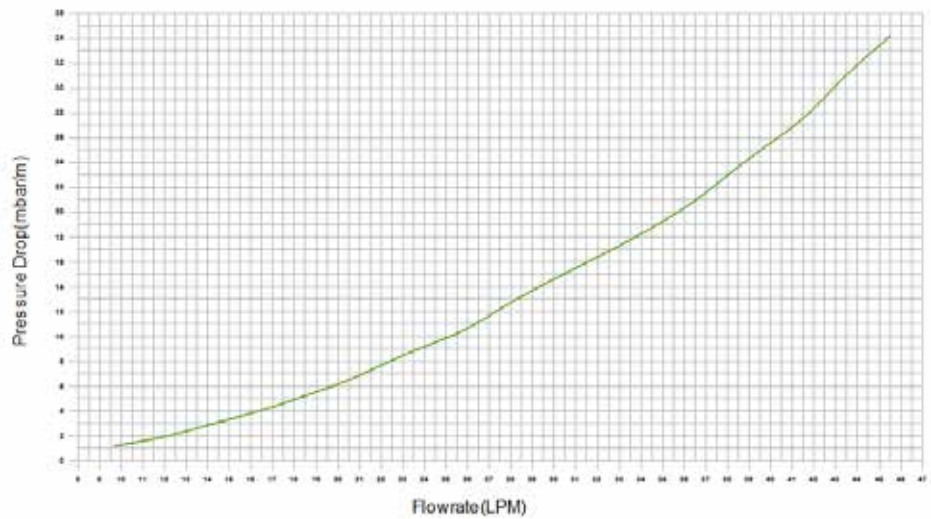
Pressure Loss Chart of DN16 Solar Flexible Hose



Pressure Loss Chart of DN20 Solar Flexible Hose



Pressure Loss Chart of DN25 Solar Flexible Hose



## QUICK COUPLING SYSTEM

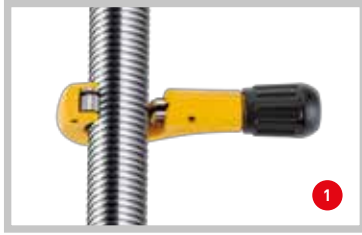
CODE	FLEX DN	OUTER THREADED
60.16.012	DN 16	1/2"
60.16.016	DN 16	3/4"
60.16.025	DN 16	1"

CODE	FLEX DN	OUTER THREADED
60.20.012	DN 20	1/2"
60.20.016	DN 20	3/4"
60.20.025	DN 20	1"

CODE	FLEX DN	OUTER THREADED
60.25.012	DN 25	1/2"
60.25.016	DN 25	3/4"
60.25.025	DN 25	1"



# ASSEMBLY INSTRUCTIONS



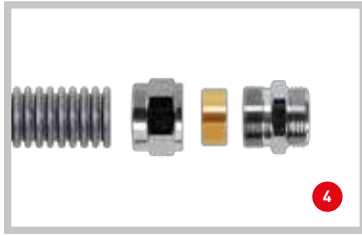
Cutting the hose with a cutter



T Piece



Assembly of T piece with two tools.



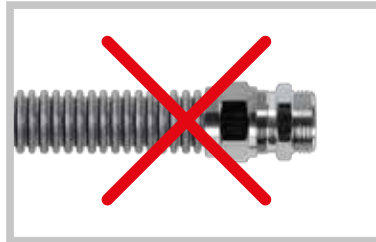
Quick Coupling Union Parts



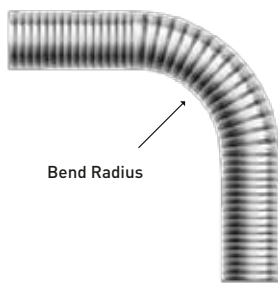
Assembly of Quick Coupling Union with two tools



Correct Assembly



False Assembly

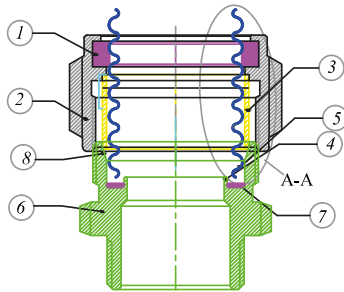


Min. Bend Radius (mm)		
DN 16	DN 20	DN 25
20	25	30

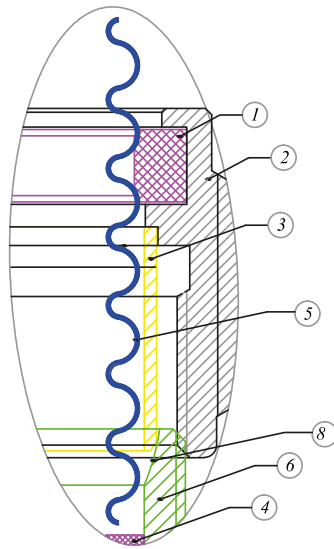
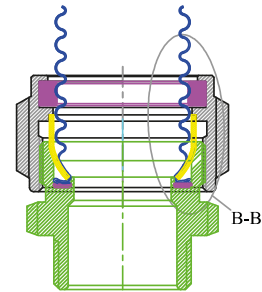


# ASSEMBLY INSTRUCTIONS

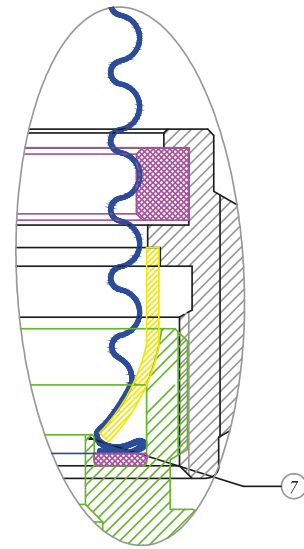
## Before Assembly



## After Assembly



AA detail  
Scale 3:1



BB detail  
Scale 3:1

CODE	ITEM	PIECE	MATERIAL
8	Easy and Slippery Surface	1	
7	Canal	1	CW614N
6	Nipple	1	316L
5	Corrugated Flexible Hose	1	NBR
4	Nipple Gasket Seat	1	MS63 Brass
3	Metal Gasket	1	CW614N
2	Nut	1	CW614N
1	Gasket	1	NBR

## SOLAR FITTING GROUP



CODE	NAME	SIZE
54.01.SP	Brass Nut	DN 12
8300-SP	Brass Nut	DN 16
251-S	Brass Nut	DN 20
252-S	Brass Nut	DN 25



CODE	NAME	SIZE
8017	Klingerit Gasget	DN 12
8108	Klingerit Gasget	DN 16
8112	Klingerit Gasget	DN 20
8114	Klingerit Gasget	DN 25



CODE	NAME	SIZE
T-519	S. Steel Ring	DN 12
T-520	S. Steel Ring	DN 16
T-521	S. Steel Ring	DN 20
T-522	S. Steel Ring	DN 25



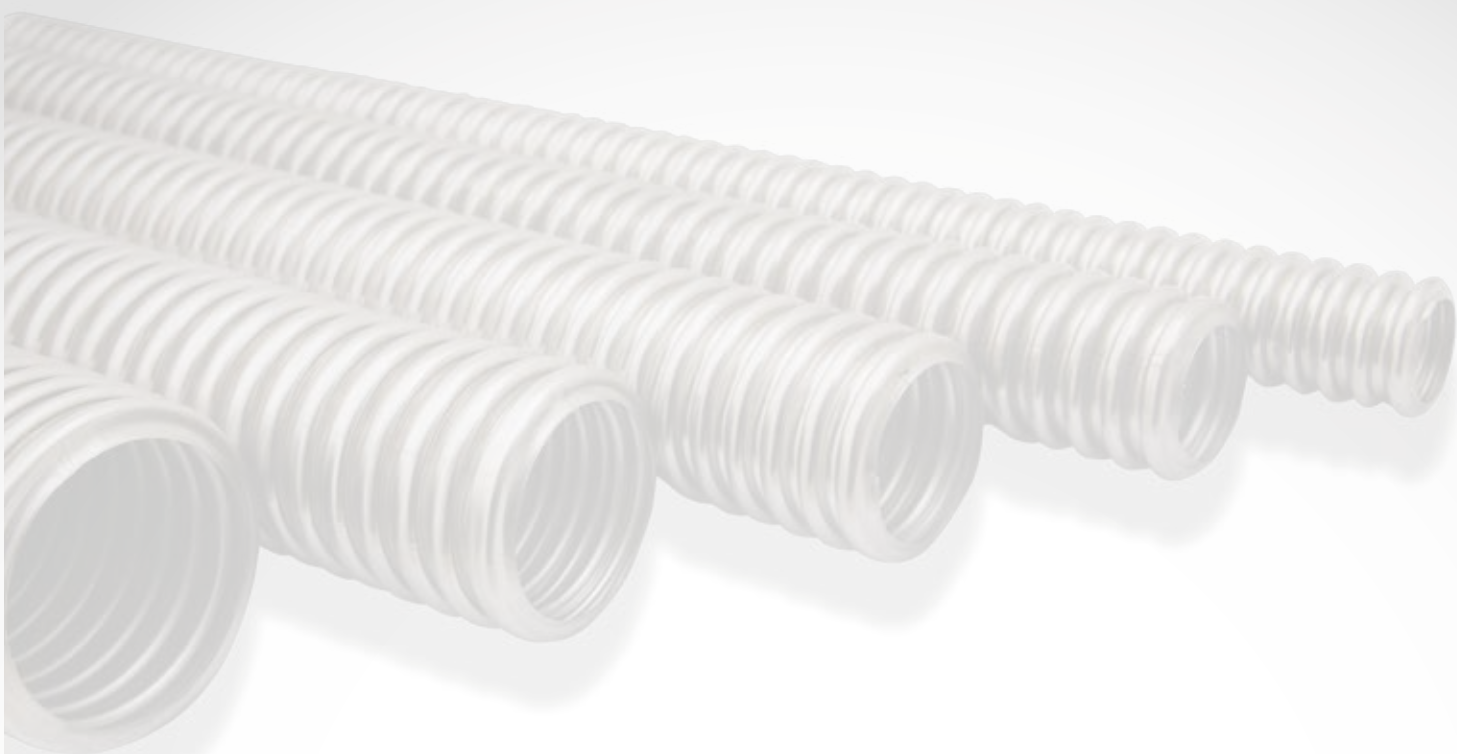
CODE	NAME	SIZE
02.02.201	Brass Nipple M/M	1/2"
02.02.202	Brass Nipple M/M	3/4"
02.02.203	Brass Nipple M/M	1"



CODE	NAME	SIZE
19.01.914	Nipple With Ring And Nut	1/2"
19.01.915	Nipple With Ring And Nut	3/4"
19.01.916	Nipple With Ring And Nut	1"



CODE	NAME	SIZE
46.70.000	Hammer	--
46.70.012	Hammer Die	12
46.70.016	Hammer Die	16
46.70.020	Hammer Die	20



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# **BOILER** SYSTEM

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**KAS<sup>®</sup>**

## KAS BOILER FLEX

The corrugated flexible hoses applied with Stainless Steel AISI 316L for solar tanks and boiler systems transfer the heat in manifolds to tanks and boilers in order to heat the water in the tank. In this appliance, there is a heater tank fixed into the manifolds or a vertical single heater.

Corrugated flexible hoses manufactured according to size of the tanks and its volume can be also fixed with separated fittings . KAS Result & Development Department can also design new style fittings according to needs of the partners.

### **Advantages;**

By the help of the pitch on Stainless Steel Corrugated Hoses, the system is more productive than the rigid conduit systems.

The rate of heat is more productive and faster.

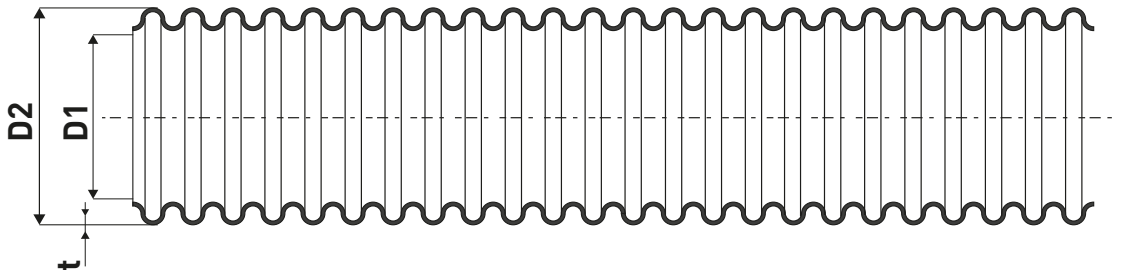
Because of being lighter and being flexible, the system enables easy-fixing method.

AISI 316L is convient for potable water.

This system prevents Structural defect of the dilatation while transferring hot & cold water and enables high protection and resistance against lime and corrosion

Stainles Steel AISI 316L material is suitable for drinking water.

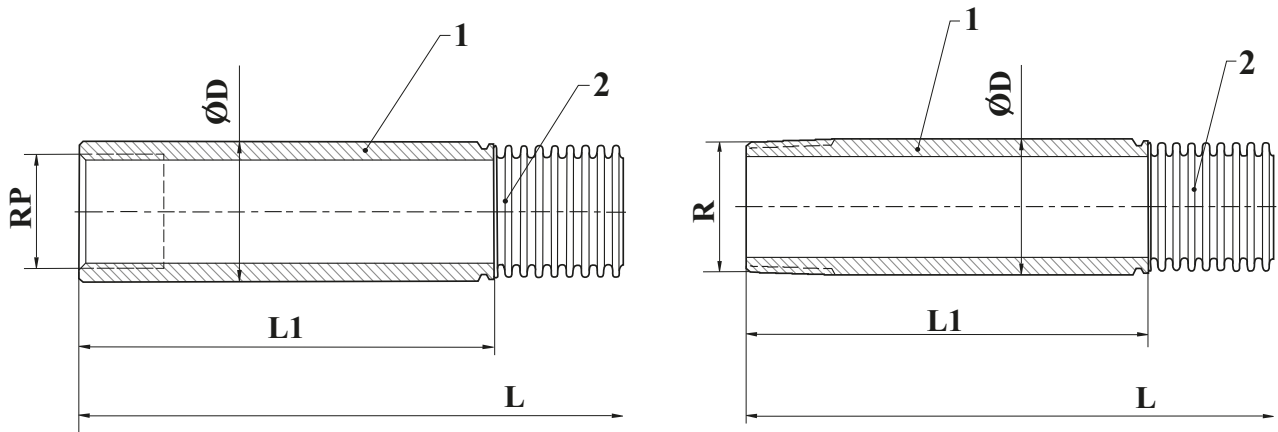
# TECHNICAL SPECIFICATIONS OF KAS FLEXIBLE STAINLESS STEEL BOILER FLEX



DN	Outer Diameter (D2) mm	Internal Diameter (D1) mm	Material Thickness (t) mm	Material	Weight ( %10 = ) (gr / m)	Surface ( %5 ± ) (m <sup>2</sup> / m)	Volume ( %5 ± ) (dm <sup>3</sup> / m)	Corrugation per 100 mm	Bend Radius (Static) r min (mm)	Working Pressure 20 °C (bar)	Nominal Pressure DIN EN ISO 10380 (Pn)	Code
16	Ø21,3 ±0,2	Ø16,2 ±0,2	0,18	AISI 31 6L	142	0,0949	0,2728	22	25	16	16	04.16.316
20	Ø26,4 ±0,2	Ø20,9 ±0,2	0,18	AISI 31 6L	185	0,1446	0,4271	21	30	10	10	04.20.316
25	Ø31,2 ±0,4	Ø25,3 ±0,3	0,2	AISI 31 6L	245	0,1586	0,6335	19	35	10	10	04.25.316
32	Ø40.6	Ø33.4	0.25	AISI 31 6L	400	0.0947	0.2732	22	50	16	16	01.32.316
40	Ø49.8	Ø39.8	0.25	AISI 31 6L	710	0.1446	0.4271	21	60	10	10	01.40.316
50	Ø60.8	Ø50.5	0.25	AISI 31 6L	850	0.1444	0.4264	21	70	10	10	01.50.316

# TECHNICAL INFORMATION FOR KAS BOILER FLEXIBLE HOSES

Technical Data			
DN	Inner Threaded (Rp'')	Outer Threaded (R'')	ØD
16	3/8'' * 3/8''	1/2'' * 1/2''	21.3
20	1/2'' * 1/2''	3/4'' * 3/4''	26.9
25	3/4'' * 3/4''	1'' * 1''	33.7
32	1'' * 1''	1 1/4'' * 1 1/4''	42.4
40	1 1/4'' * 1 1/4''	1 1/2'' * 1 1/2''	48.3
50	1 1/2'' * 1 1/2''	2'' * 2''	60.3
	2'' * 2''	-	70



Material		
1	Fittings	Stainless Steel AISI 316
2	Hose	Stainless Steel AISI 316 L

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**INSULATED**  
SOLAR HOSES

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**KAS**<sup>®</sup>

## KAS INSULATED FLEX

### Kas Solar Flex Single Tube Without Cable UV Cover

DIAMETER	SIZE	DESCRIPTION	THICKNESS
DN 16	13x22 mm	Solar Flex Single	13
DN 20	13x28 mm	Solar Flex Single	13



### Kas Solar Flex Double Tube Without Cable UV Cover

DIAMETER	SIZE	DESCRIPTION	THICKNESS
DN 16	13x22 mm	Solar Flex Double	13
DN 20	13x28 mm	Solar Flex Double	13



### Kas Solar Flex Single Tube With Cable UV Cover

DIAMETER	SIZE	DESCRIPTION	THICKNESS
DN 16	13x22 mm	Solar Flex Single	13
DN 20	13x28 mm	Solar Flex Single	13



### Kas Solar Flex Double Tube With Cable UV Cover

DIAMETER	SIZE	DESCRIPTION	THICKNESS
DN 16	13x22 mm	Solar Flex Double	13
DN 20	13x28 mm	Solar Flex Double	13





# TECHNICAL DATA SHEET

PROPERTY	TECHNICAL DATA	TEST METHOD	LAB / TEST REPORTS
Thermal conductivity (A)	0°C - 0.035W/mK		
	10°C - 0.036W/mK	EN 12667	self monitoring
	20°C - 0.037W/mK	EN ISO 8497	
	40°C - 0,040W/mK		DEMOKRITOS
Permeability (Ij)	→ 7000	EN 13469, EN 12086	self monitoring. RTU / BDA KEUR
Density (p)	50 - 65 Kgr/rrr	EN 13470 & EN 1602	self monitoring
Tensile strength (Pa)	→0.15 Mpa	EN ISO 1798	self monitoring
Tensile strength (Pa) of UV Film	→0.10 Mpa	ASTM D 882	
Elongation at break	→ 150%	EN ISO 1798	self monitoring
Elongation at break of UV Film	→ 200%		
Operating temperatures (°C)	Pipes, Slit & Seal: -40°C to +105°C	EN 14706. EN 14707	
	Solar Film		
	-80 C i'toc, -80 C		
Fire rating	B-s3, d0 Class 0, Class 1	DİN 4102-1 or EN 13501-1	Prüfinstitut Hoch
Diameter tolerance	Pipes, Slit & Seal: 06 - 042: +1mm to +3mm	PrEN 13467	self monitoring
Thickness	Pipes: 6mm, 9mm,13mm: ±1% 19mm: ±2% 25mm,30mm: ±2%	PrEN 13467	self monitoring
	Slit & Seal: 19mm: ±1,5mm 25mm: ±2mm	PrEN 13467	self monitoring
	Overlap Slit & Seal: 120ljm: ±15	DİN 53370	self monitoring
	UV Film: ← 0,15mm	DİN 53370	self monitoring
Oil & Grease resistance	Very good	ASTM D 471	self monitoring
UV resistance	Excellent	ASTM D 518	self monitoring
Weather resistance	Excellent	ASTM D 518	self monitoring
Noise reduction	Up to 30dB	DİN 4109	
Dimensional stability	1.5-3%	PrEN 14304. EN 1604	self monitoring
Colour of UV Film	Black		
CFC, HFC, HCFC	Free		
Odor	Neutral		
Adhesion for Slit & Seal	Overlap: 6 N/cm	NF EN 1464 ISO 4578 IOP 041	
	Self adhesive stripe 6 N/cm	FINAT NO 9-IOP 043	
Static temperature resistance	100°C continuous		
Slit & Sealv			

The written figures are these that have been measured in our laboratory, under typical conditions. They can be modified without prior notice. You are kindly requested to assert their validity before any special usage.



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**SPRINKLER HOSE  
WITH BRAIDING  
AND CONNECTION  
ADAPTER**

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**KAS<sup>®</sup>**

## GENERAL EXPLANATIONS

KAS sprinkler hose and connection kit can be safely used in fire extinguishing systems due to its structure not being affected by seismic motions and the braided hose's resistance to heat and pressure.

Primary advantages are connecting the sprinkler to the fire line with minimum effort and installing the device easily into ceiling with its connection kit.

Public places like shopping centers, hotels, theaters, cinemas where the response time is really important are where the system is mostly chosen.

There are many advantages using KAS Sprinkler Hose and Connection Adapter to mount sprinkler systems.

Most important ones are minimum workmanship time provided by easy installation, safer sprinkler systems against seismic motions and adjustability without being dependent upon design of installation lines.

Proficiency and time is needed for adjusting the steel installation line to the desired sprinkler mounting point using elbows, couplings etc.

By using KAS Sprinkler Adapter, it is quite easy to align and tighten sprink side of sprinkler hose with desired point (usually middle point of grid) of ceilings.

Additionally, due to convenient design of hose fixing apparatus, sprink side of hose can be adjusted on vertical axis.

As a result, height of sprinkler head and escutcheon can be adjusted relative to ceilings.

## GENERAL SPECIFICATIONS



Dimensions and Operating Conditions		
Hose Diameter	DN 20 - 3/4"	DN 25 - 1"
Connection Diameter	Nipple Side 1" / Sprink Side 1/2"	
Standard Length	600 - 900 - 1200 - 1500 - 1800 mm	
Operating Pressure	20 bar / 290 psi	
Ambient Temperature Rating	149 °C / 300 °F	
Minimum Bending Radius	70 mm	100 mm
Largest K-Factor	8.0 GPM/psi <sup>1/2</sup>	
Wet - Dry Systems	Both	
Connection to Fire Sprinkler	Direct	

Material Specifications	
Hose	AISI 316L Stainless Steel
Braiding Wire	AISI 304 Stainless Steel
Connections	Carbon Steel (Standard) / Stainless Steel (Optional)
Connection Adapter	Carbon Steel (Zinc Coated)

Friction Losses and Specifications (UL Listed)						
Model No	Hose Length	Input Diameter	Output Diameter	Max. No of 90° Bends	Equivalent Length of 1" Sch 40 Pipe	Maximum Pressure
A-SP600-20	0.6m 2ft	1 inch	1/2 inch	2	40	20 bar/290 psi
A-SP900-20	0.9m 3ft	1 inch	1/2 inch	3	60	20 bar/290 psi
A-SP1200-20	1.2m 4ft	1 inch	1/2 inch	3	71	20 bar/290 psi
A-SP1500-20	1.5m 5ft	1 inch	1/2 inch	3	87	20 bar/290 psi
A-SP1800-20	1.8m 6ft	1 inch	1/2 inch	3	107	20 bar/290 psi

# TECHNICAL DRAWINGS

Kit Fixing Apparatus (Lay-in)



Kit Fixing Apparatus (Clip-in)



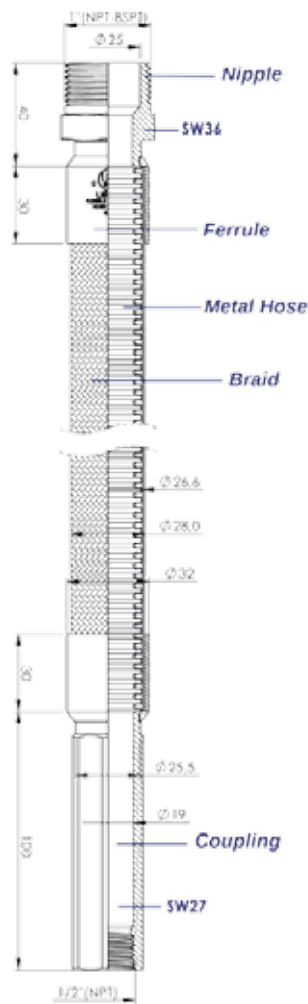
Hose Fixing Apparatus



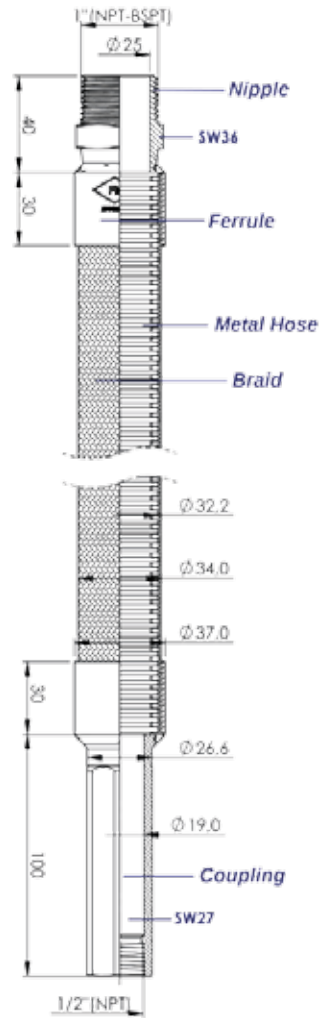
Kit Suspension Profile



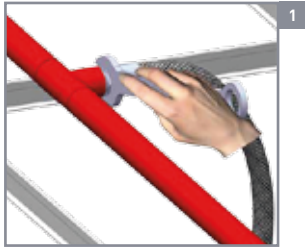
DN20 Hose Technical Drawing



DN25 Hose Technical Drawing



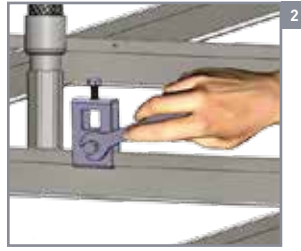
# INSTALLATION INSTRUCTIONS



The hose is attached and tightened to the mechanical-t, tee or welded coupling on the fire line by a SVV-36 wrench.

On this process, because the thread of nut is conical (NPT, BSPT), no gasket is required.

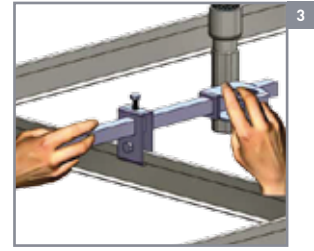
You may need to consult NFPA guidelines for using Teflon tape or pipe sealant during this process.



The right and left fixing apparatuses are attached to the approximate middle of metal grid by rule of thumb and tightened using a SVV-10 wrench not to be fully tight.

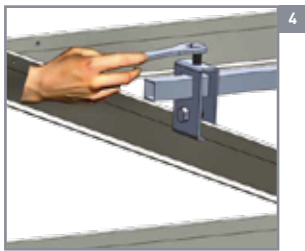
It is recommended not to complete tightening because further fine tuning may be required.

At this phase, the bolts upper parts of the fixing apparatuses are not to be tightened.



After putting the profile through right or left fixing apparatus, continue pushing the profile to the opposite direction at the same plane.

Continue pushing until profile passes through hose fixing apparatus and the opposite kit fixing apparatus and profile has equal lengths stuck at both sides.



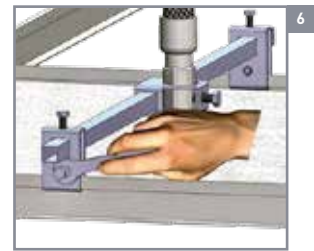
The upper bolts of right and left kit apparatuses are tightened using a SW-10 wrench.

It is recommended to do this by a torque-limited wrench at 2 pound-foot [2.7 N.m] torque.



Sprinkler side of the sprinkler hose is placed in the hose fixing apparatus, and apparatus is adjusted to be aligned with the hole on ceiling.

The bolt of the apparatus is tightened using SVV-19 wrench. It is recommended to do this by a torque-limited wrench at 5 pound-foot [6.8 N.m] torque.



The whole set is aligned so that the sprinkler side of hose is aligned with the hole on ceiling.

The bottom bolts of right and left kit fixing apparatuses are tightened using a SVV-10 wrench.

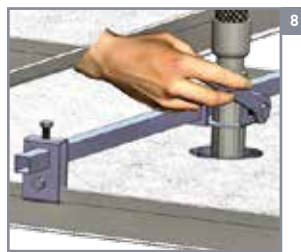
It is recommended to do this by a torque-limited wrench at 2 pound-foot [2.7 N.m] torque.



The sprinkler head and escutcheon are tightened to sprink end of hose according to NFPA and sprinkler head manufacturer's guidelines.

Thread type of sprinkler head and hose is conical (NPT), so, no gasket is required.

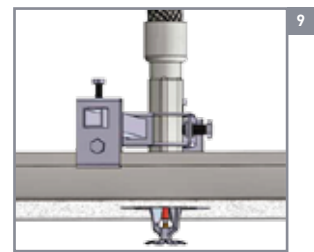
You may need to consult NFPA guidelines for using Teflon tape or pipe sealant during this process.



Loose the bolt on the hose fixing apparatus and adjust the level of sprink side of sprinkler hose relative to ceiling structure as desired.

Finally tighten the bolt using a SW-19 wrench.

It is recommended to do this by a torque-limited wrench at 5 pound-foot [6.8 N.m] torque.



Test the installation of sprinkler system against leaks per NFPA. Finally, sprinkler hose and connection adapter is ready to help protecting living beings and structures against the risk of fire.

Resistance of our product against pressure, temperature, vibration and corrosion is tested in UL Laboratories, USA.

« Back To The Nature

**KAS**<sup>®</sup>

**Kayalar Grup**

Esenkent Mah. Dudullu OSB. 2. Cad. No: 6  
34776 Ümraniye İstanbul / Türkiye  
Tel: +90 216 466 55 27  
Faks: +90 216 466 55 07

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