



# O-FLEX TUBE

THERMAL PROTECTION

VOL.6<sub>x</sub>

- Thermal insulation
- Heat retention
- Weather resistance
- Vibration resistance
- Light weight
- Flexibility

**OHTSUKA**



## O-FLEX TUBE

*It's superior in light weight and thermal insulation and heat resistance performance.*

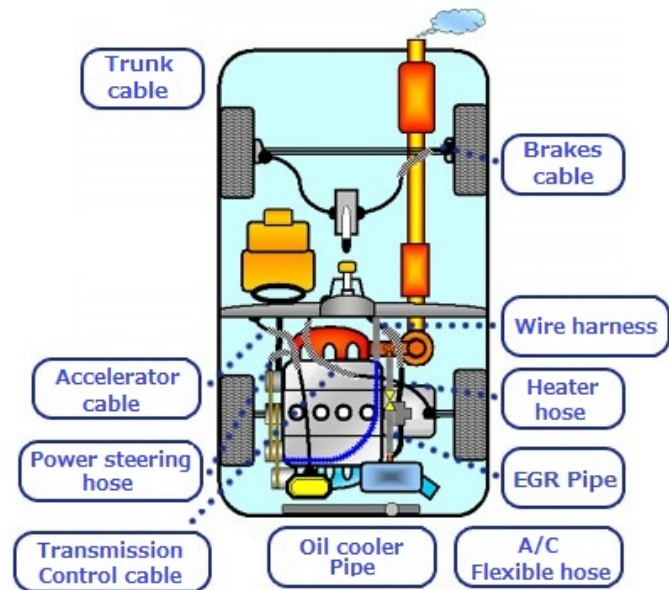
*It's flexible tube suitable for the demand in the times of the high-quality low price.*



### I . Purpose

★ Heat-protection and Heat-retention (various hoses, plumbing, cables, and more)

- Automotive
    - Various cables cover
    - Defroster hose
    - Ventilation hose
    - Hot-air hose
    - EGR pipe cover
    - Exhaust pipe cover
    - Oil pressure hose cover
- And more



[ Use example for automotive ]

- Hot-air drier (Fan, Exhaust)
- Printer, Copier (Intake, Exhaust)
- Marine, Buildings (A/C, Intake, Exhaust, Ventilation)
- Industrial equipment (Hose, Pipe, Thermal insulation)

### II . Characteristic

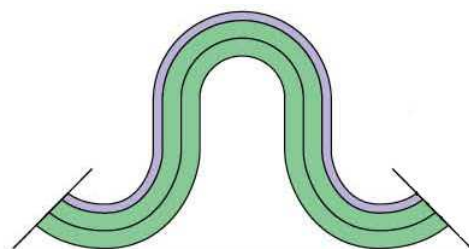
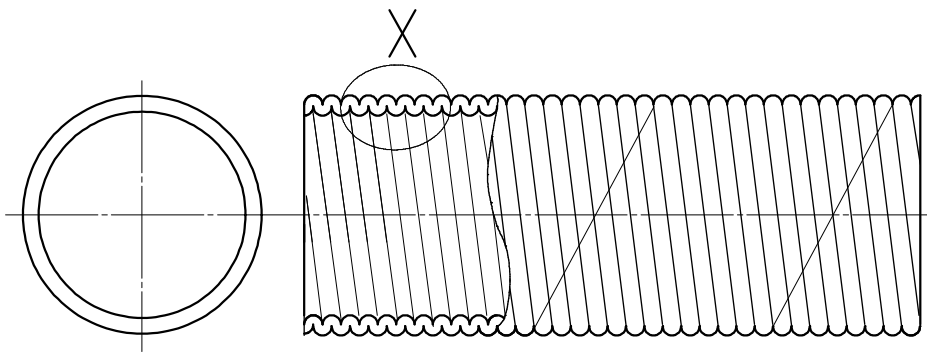
- It's flexible and light weight.
- It is superior in thermal insulation.
- It is available for various environmental conditions.  
(Heat resistance, cold resistance, water resistance, oiliness-resistant, vibration resistance, medicine characteristics-resistant)
- Combined with optional glass-wool (heat resistant temperature 700 °C) or silica-mat (heat resistant temperature 1000 °C), it contributes to thermal insulation of high temperature piping and keeping warm in cold areas.

★ Regarding the content of this catalog, specifications and appearance may be changed without notice.

### III. About installation

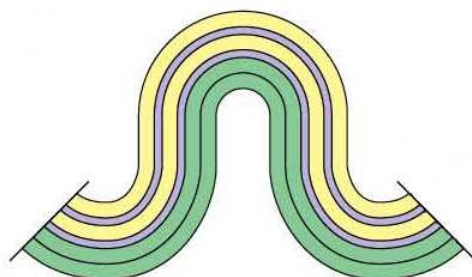
- It's available on bending pipes and hose(90 degree and S-shape etc.)
- If you apply a full length slit, you can easily install it even after assembling the protected.
- It is possible to fix with a band or tape. (V type slit can be done to fixed part.)
- You can cut it readily with a cutter knife. (Some exceptions)

### IV. Configuration(Shape)



- Material
- Aluminum
  - Heat resistance paper

X cross section ( ex. CA )



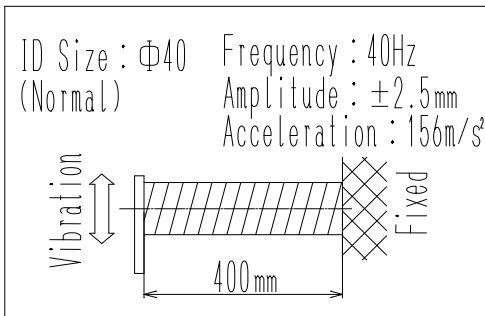
- Material
- Glass cloth
  - Aluminum
  - Heat resistance paper

X cross section ( ex. CAG )

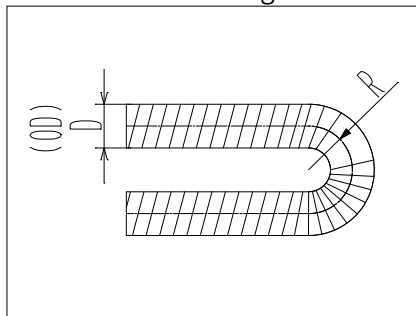
V. Test method

- Performance (excluding some) was confirmed by the following test method.  
(The data is a guideline for selecting the type, it is not guaranteed value because it varies depending on size and condition.)

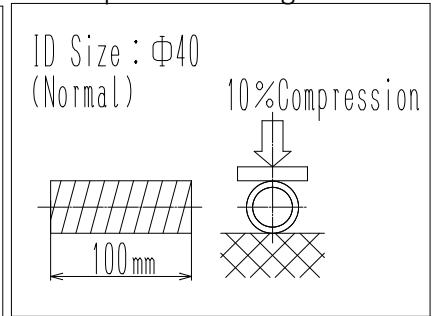
■ Vibration resistance



■ Minimum bending radius



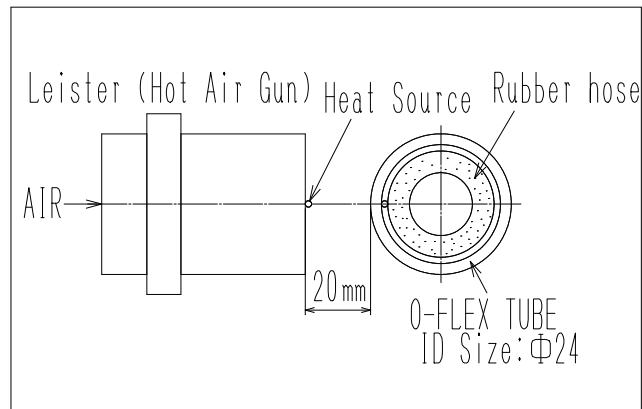
■ Compressive strength



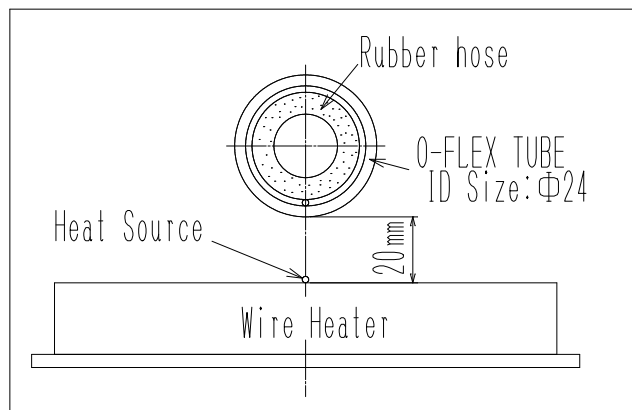
■ Thermal Insulation

Under the same heat source condition, we compared the surface temperature at rubber hose alone and the rubber hose surface temperature when covered with O-FLEX TUBE.

Hot Air Test



Radiant Heat Test



## Main uses and heat resistant temperature by type

★ Please use as a guide for type selection.

Main applications	Usual temperature range				
	~130℃	~200℃	~250℃	~300℃	~650℃
Flame resistant cover	AA GAA		SA AS		SS
Damage prevention cover	AS				SS
Insulation cover (Cable, hose, and more)	PA	CA GAA	XA CAG CAGA ACAG	XAG AXAG	SS
Metal piping cover (Dechlorination)	PA	CA GAA	XA-O(ECO) XA CAG CAGA	XAG SA AS	SS
Air hose	APA PAP	ACA	ACAG	AXAG	SS
Soft type	CA-OS		XA-O(ECO)		
Glass-wool or silica-mat combination <sup>※</sup>	Combination ex. G-CAG, G-XA, G-SS, M-CAG, M-XA, M-SS or more...				

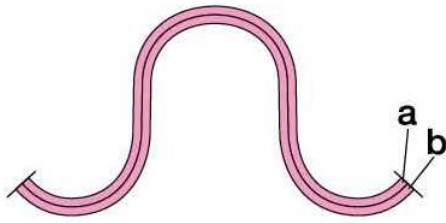
※ It corresponds to cases where high heat insulation and heat retention are required.  
 The heat resistance of glass-wool is 700℃ and heat resistance of silica-mat is 1000℃.  
 We can manufacture up to inner diameter Φ32~(for normal type), Φ18~(for full-length slit opening type).  
 Product length can be manufactured from 100~700 mm.  
 Please contact us for details.

G-●▲ : Combination of glass-wool and O-FLEX

M-●▲ : Combination of silica-mat and O-FLEX

# SS

Cross section



Material	a Stainless Steel	+0.04
	b Stainless Steel	+0.04

- Heat resistance: Continuous 650°C  
1h 700°C
- Purpose :  
Flame resistant cover  
Damage prevention cover
- Vibration resistance : Normal
- Minimum bending radius : 2.0×D
- Compressive strength : Over 300N
- Availability : Φ24~
- Thermal Insulation

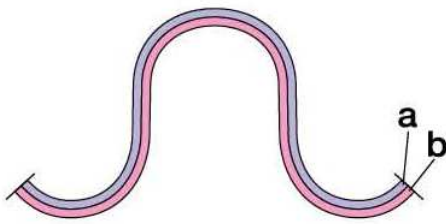
Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with SS	Uncovered	Covered with SS
200°C	175°C	163°C	133°C	115°C
250°C	213°C	200°C	165°C	145°C



# SA

Cross section



Material	a Aluminum	+0.05
	b Stainless Steel	+0.04

- Heat resistance: Continuous 300°C  
1h 350°C
- Purpose :  
Flame resistant cover
- Vibration resistance : Normal
- Minimum bending radius : 2.0×D
- Compressive strength : Over 300N
- Availability : Φ24~
- Thermal Insulation

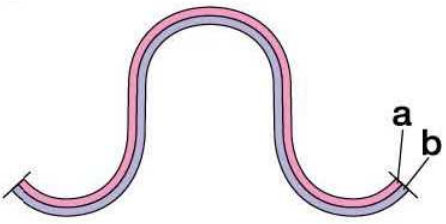
Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with SA	Uncovered	Covered with SA
200°C	175°C	141°C	133°C	87°C
250°C	213°C	176°C	165°C	110°C



# AS

Cross section



Material	a Stainless Steel	+0.04
	b Aluminum	+0.05

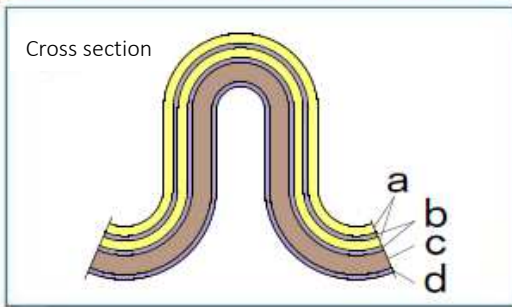
- Heat resistance: Continuous 300°C  
1h 350°C
- Purpose :  
Flame resistant cover  
Damage prevention cover
- Vibration resistance : Normal
- Minimum bending radius : 2.0×D
- Compressive strength : Over 300N
- Availability : Φ24~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with AS	Uncovered	Covered with AS
200°C	175°C	145°C	133°C	97°C
250°C	213°C	180°C	165°C	125°C



# AXAG



Material	a Glass cloth	+0.1
	b Aluminum	+0.05
	c High heat resistance paper	+0.25
	d Aluminum	+0.05

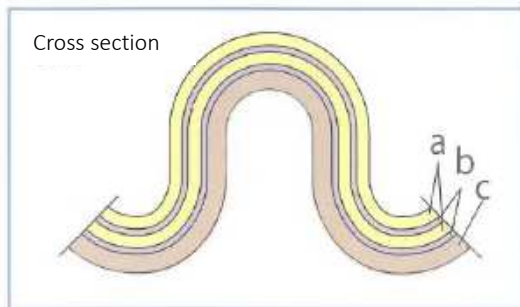
- Heat resistance: Continuous 300°C  
1h 350°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Excellent
- Minimum bending radius : 2.0×D
- Compressive strength : Over 150N
- Availability : Φ28~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with AXAG	Uncovered	Covered with AXAG
200°C	175°C	126°C	133°C	103°C
250°C	213°C	155°C	165°C	132°C



# XAG



Material	a Glass cloth	+0.1
	b Aluminum	+0.05
	c High heat resistance paper	+0.25

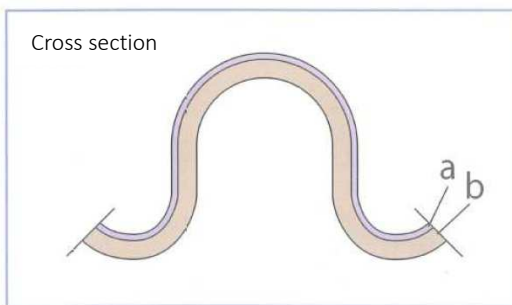
- Heat resistance: Continuous 300°C  
1h 350°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Excellent
- Minimum bending radius : 1.7×D
- Compressive strength : Over 100N
- Availability : Φ10~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with XAG	Uncovered	Covered with XAG
200°C	175°C	135°C	133°C	108°C
250°C	213°C	160°C	165°C	138°C



# XA



Material	a Aluminum	+0.05
	b High heat resistance paper	+0.25

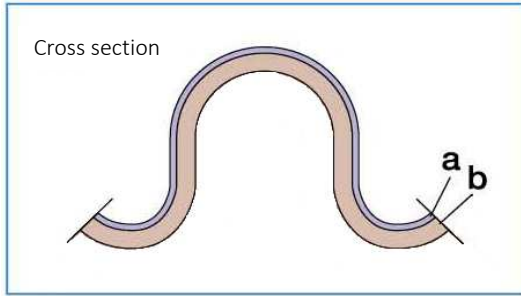
- Heat resistance: Continuous 250°C  
1h 300°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 100N
- Availability : Φ10~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with XA	Uncovered	Covered with XA
200°C	175°C	153°C	133°C	90°C
250°C	213°C	185°C	165°C	113°C



# XA-O (ECO) (Soft type)



Material	a Aluminum	+0.05
	b High heat resistance paper	+0.25

- Heat resistance: Continuous 250°C  
1h 300°C
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 50N
- Thermal Insulation

● Purpose :  
Insulation cover  
Hot air hose

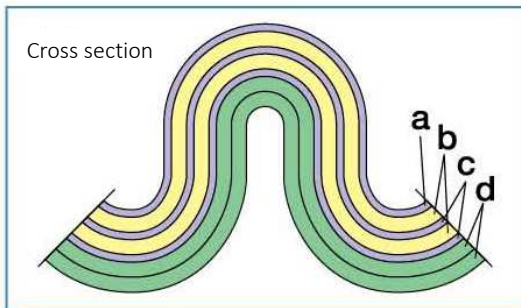
● Availability : Φ10~

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with XA-Eco	Uncovered	Covered with XA-Eco
200°C	175°C	155°C	133°C	90°C
250°C	213°C	187°C	165°C	113°C



# CAGA



Material	a Aluminum	+0.05
	b Glass cloth	+0.1
	c Aluminum	+0.05
	d Heat resistance paper	+0.2

- Heat resistance: Continuous 250°C  
1h 300°C
- Vibration resistance : Excellent
- Minimum bending radius : 2.0×D
- Compressive strength : Over 200N
- Thermal Insulation

● Purpose :  
Insulation cover  
Hot air hose

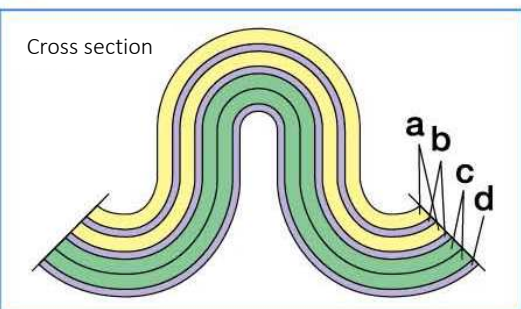
● Availability : Φ13.5~

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with CAGA	Uncovered	Covered with CAGA
200°C	175°C	143°C	133°C	80°C
250°C	213°C	176°C	165°C	100°C



# ACAG



Material	a Glass cloth	+0.1
	b Aluminum	+0.05
	c Heat resistance paper	+0.2
	d Aluminum	+0.05

- Heat resistance: Continuous 250°C  
1h 300°C
- Vibration resistance : Excellent
- Minimum bending radius : 2.0×D
- Compressive strength : Over 200N
- Thermal Insulation

● Purpose :  
Insulation cover  
Hot air hose

● Availability : Φ28~

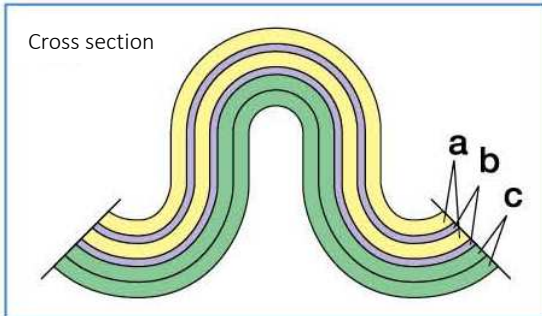
Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with ACAG	Uncovered	Covered with ACAG
200°C	175°C	126°C	133°C	103°C
250°C	213°C	155°C	165°C	132°C





# CAG



Material	a Glass cloth	+0.1
	b Aluminum	+0.05
	c Heat resistance paper	+0.2

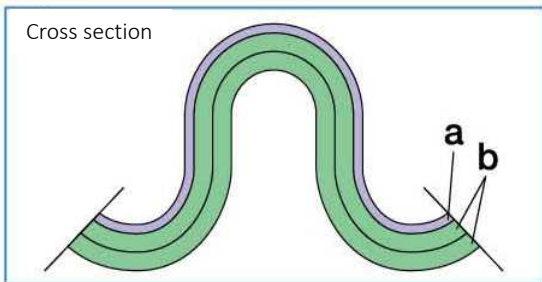
- Heat resistance: Continuous 250°C  
1h 300°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Excellent
- Minimum bending radius : 1.7×D
- Compressive strength : Over 150N
- Availability : Φ10~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with CAG	Uncovered	Covered with CAG
200°C	175°C	135°C	133°C	108°C
250°C	213°C	160°C	165°C	138°C



# CA



Material	a Aluminum	+0.05
	b Heat resistance paper	+0.2

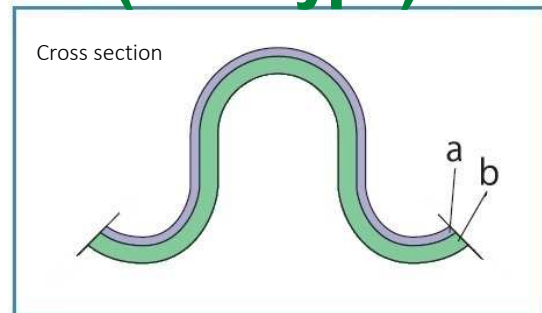
- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 150N
- Availability : Φ10~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with CA	Uncovered	Covered with CA
200°C	175°C	153°C	133°C	90°C
250°C	213°C	185°C	165°C	113°C



# CA-OS (Soft type)



Material	a Aluminum	+0.05
	b Heat resistance paper	+0.2

- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 50N
- Availability : Φ10~
- Thermal Insulation

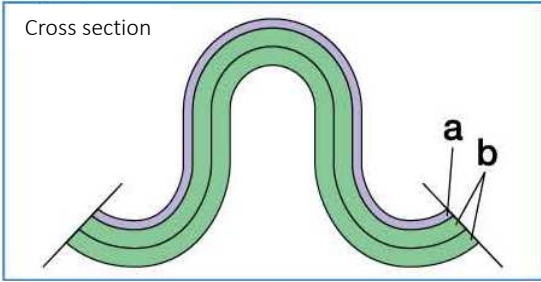
Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with CA-OS	Uncovered	Covered with CA-OS
200°C	175°C	155°C	133°C	90°C
250°C	213°C	187°C	165°C	113°C



# CA (Black)

Cross section



Material	a Aluminum (Black)	+0.05
	b Heat resistance paper	+0.2

- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 100N
- Availability : Φ10~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with CA(Black)	Uncovered	Covered with CA(Black)
200°C	175°C	145°C	133°C	115°C
250°C	213°C	176°C	165°C	145°C



# CA (Red)

Cross section



Material	a Aluminum (Red)	+0.05
	b Heat resistance paper	+0.2

- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 100N
- Availability : Φ10~
- Thermal Insulation

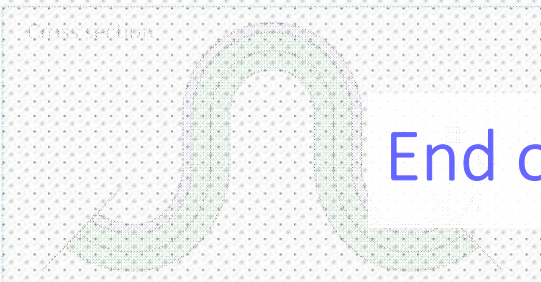
Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with CA(Red)	Uncovered	Covered with CA(Red)
200°C	175°C	145°C	133°C	115°C
250°C	213°C	176°C	165°C	145°C

End of product.

# CA (Blue)

Cross section



Material	a Aluminum (Blue)	+0.05
	b Heat resistance paper	+0.2

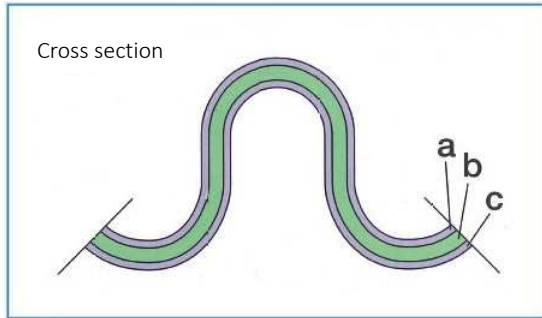
- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 100N
- Availability : Φ10~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with CA(Blue)	Uncovered	Covered with CA(Blue)
200°C	175°C	145°C	133°C	115°C
250°C	213°C	176°C	165°C	145°C

End of product.

# ACA



Material	a Aluminum	+0.05
	b Heat resistance paper	+0.2
	c Aluminum	+0.05

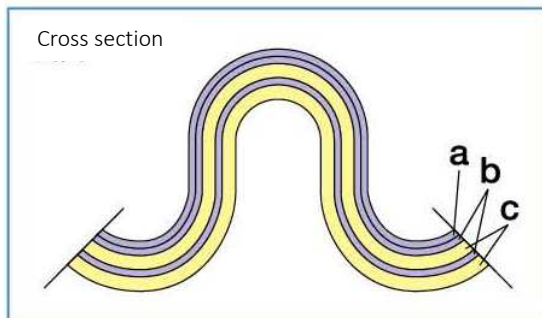
- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Insulation cover  
Hot air hose
- Vibration resistance : Normal
- Minimum bending radius : 2.0×D
- Compressive strength : Over 300N
- Availability : Φ28~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with ACA	Uncovered	Covered with ACA
200°C	175°C	145°C	133°C	86°C
250°C	213°C	180°C	165°C	111°C



# GAA



Material	a Aluminum	+0.05
	b Aluminum	+0.05
	c Glass cloth	+0.1

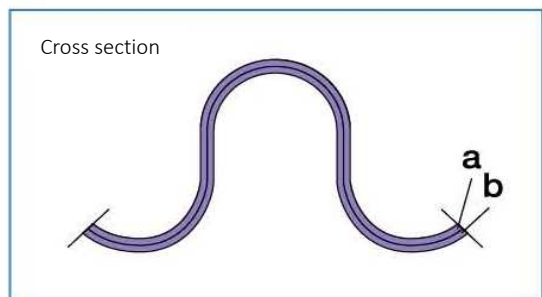
- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Flame resistant cover  
Insulation cover
- Vibration resistance : Normal
- Minimum bending radius : 1.7×D
- Compressive strength : Over 150N
- Availability : Φ16~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with GAA	Uncovered	Covered with GAA
200°C	175°C	143°C	133°C	85°C
250°C	213°C	177°C	165°C	110°C



# AA



Material	a Aluminum	+0.05
	b Aluminum	+0.05

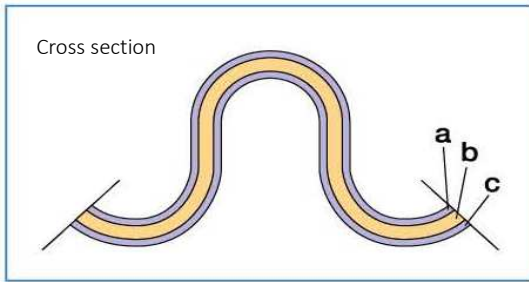
- Heat resistance: Continuous 200°C  
1h 250°C
- Purpose :  
Flame resistant cover  
Insulation cover
- Vibration resistance : Poor
- Minimum bending radius : 2.0×D
- Compressive strength : Over 150N
- Availability : Φ16~
- Thermal Insulation

Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with AA	Uncovered	Covered With AA
200°C	175°C	138°C	133°C	83°C
250°C	213°C	172°C	165°C	105°C



# APA



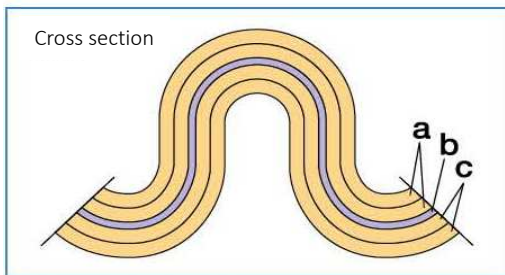
Material	a Aluminum	+0.05
	b Kraft paper	+0.2
	c Aluminum	+0.05

- Heat resistance: Continuous 130°C  
1h 150°C
- Purpose: Insulation cover, Hot air hose
- Vibration resistance: Normal
- Minimum bending radius: 2.0×D
- Compressive strength: Over 300N
- Availability: Φ25.4~
- Thermal Insulation: Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with APA	Uncovered	Covered With APA
130°C	125°C	93°C	98°C	59°C
150°C	145°C	103°C	117°C	66°C



# PAP



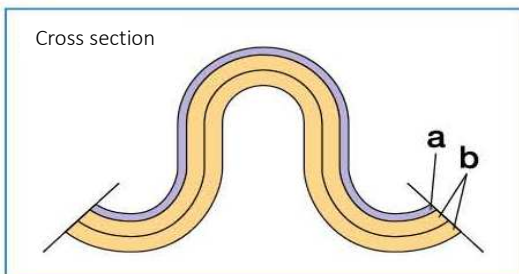
Material	a Kraft paper	+0.2
	b Aluminum	+0.05
	c Kraft paper	+0.2

- Heat resistance: Continuous 130°C  
1h 150°C
- Purpose: Air hose
- Vibration resistance: Excellent
- Minimum bending radius: 1.7×D
- Compressive strength: Over 250N
- Availability: Φ18~
- Thermal Insulation: Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with PAP	Uncovered	Covered With PAP
130°C	125°C	98°C	98°C	70°C
150°C	145°C	110°C	117°C	80°C



# PA



Material	a Aluminum	+0.05
	b Kraft paper	+0.2

- Heat resistance: Continuous 130°C  
1h 150°C
- Purpose: Insulation cover, Hot air hose
- Vibration resistance: Normal
- Minimum bending radius: 1.7×D
- Compressive strength: Over 150N
- Availability: Φ18~
- Thermal Insulation: Rubber hose surface temperature

Temperature Of Heat Source	Hot Air		Radiant Heat	
	Uncovered	Covered with PA	Uncovered	Covered With PA
130°C	125°C	103°C	98°C	63°C
150°C	145°C	117°C	117°C	68°C



## Available size list

 Manufacturable

呼称径 (内径d)	外径 φD	タイプ																				
		SS	SA	AS	AXAG	XAG	XA	XA-O(Eco)	CAGA	ACAG	CAG	CA	CA-OS	CA(黒)	ACA	GAA	AA	APA	PAP	PA		
φ10	14.5																					
φ11	15.5																					
φ13	17.5																					
φ13.5	18																					
φ14	18.5																					
φ16	20.5																					
φ17	21.5																					
φ18	22.5																					
φ20	24.5																					
φ21	25.5																					
φ22	26.5																					
φ24	28.5																					
φ25.4	29.9																					
φ28	32.5																					
φ30	34.5																					
φ31	35.5																					
φ32	36.5																					
φ35	39.5																					
φ36	40.5																					
φ38	42.5																					
φ40	44.5																					
φ41	46																					
φ42	47																					
φ44.5	49.5																					
φ46	51																					
φ48	53																					
φ50.8	55.8																					
φ54	59																					
φ55	60																					
φ58	63																					
φ60	65																					
φ63.5	68.5																					
φ65	70																					
φ66	71																					
φ70	75																					
φ76.2	81.2																					
φ80	85																					
φ82.6	87.6																					
φ85	90.7																					
φ90	95.7																					
φ95	100.7																					
φ97	102.5																					
φ100	105.5																					

Minimum order is 10M. (We can cut length as requested.)  
 Maximum length is 10M. (Tube may have seams if length is 8M or longer.)  
 METARO-FLEX available for AA and AS and SA and SS if over φ50. (See "Flexible Duct catalog" for more detail.)  
 Custom order sizes may be available even if it not listed on "Available size list". Please ask your sales person.

## ■ High heat insulation and heat retention measures item

It is possible to further enhance the insulation and heat retention effects of O-FLEX TUBE.

### ● Glass-wool or silica-mat combination ●

Combined with glass wool or silica mat, it is effective for high-temperature insulation of EGR pipes, exhaust pipes, etc., and for preventing fluid from freezing inside hoses in cold regions. It also has excellent sound absorption performance.



Target	Application example	Combination example
High insulation	High temperature insulation ( $\sim 800^{\circ}\text{C}$ )	G-XA, G-XAG, G-AXAG M-SA, M-AS, M-SS or more
Heat retention	Antifreeze ( $-40^{\circ}\text{C}\sim$ )	G-CA, G-CAG, G-ACAG or more

※ G-●▲ : Combination of glass-wool (Heatproof temperature  $700^{\circ}\text{C}$ ) and O-FLEX

※ M-●▲ : Combination of silica-mat (Heatproof temperature  $1000^{\circ}\text{C}$ ) and O-FLEX

O-FLEX TUBE can be freely selected according to the usage environment.

Usage environment: heat source conditions, temperature, position, distance, etc.

We can manufacture up to inner diameter  $\Phi 32\sim$ (for normal type)  
and  $\Phi 18\sim$ (for full-length slit opening type).

Product length can be manufactured from  $100\sim 700$  mm.

Please contact us for details.

## Custom Order

O-FLEX TUBE can be custom ordered by the assembly location.

### Molded products

It is possible to mold according to the shape of the protective part.

※ A special jig is required for processing.



### Full length slitting, Opening

Make easy for Assembly.

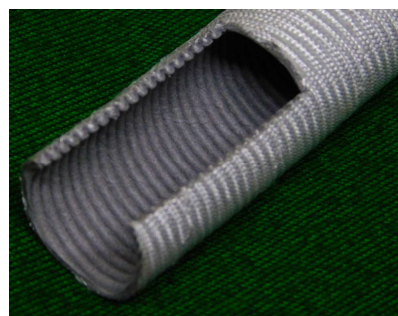
※ Some type of tubes may require jigs.



### Notching

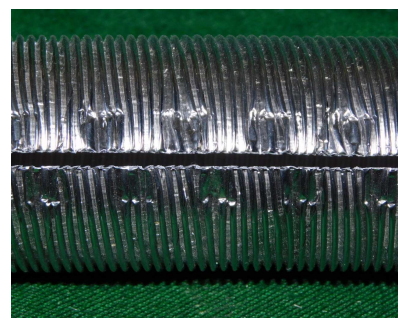
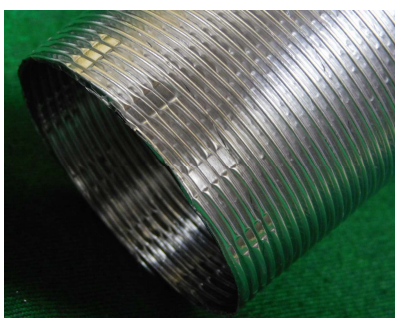
You can add notches of various shapes.

※ A special jig is required for processing.



### Edge crimping

Edge crimping to prevent fraying of materials.





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