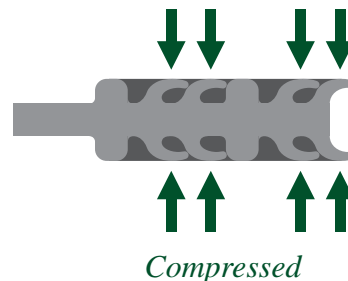
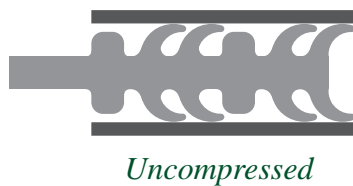


# THE FUTURE OF HIGH PERFORMANCE SEALING HAS ARRIVED

## *Patented* **FISHBONE™**



- **1,000,000** times lower leakage than TA-LUFT Test limit
- **25** times lower leakage than Chevron Fugitive Emissions Test limit
- **Pass** API 6FB Fire Test

## ● A brief history of Metal Gaskets

*In 1912, over 100 years ago*

### ● **Spiral Wound Gaskets** - A great invention for its time

#### Advantages

- ✧ Combine strength from metal strips with sealing capability from a non-metallic material
- ✧ Self-energized by fluid pressure

#### Disadvantages

- ✧ The “un-wind” and crushing problem
- ✧ High minimum sealing load requirement causes bolt yielding and flange rotation



*In 1976, over 36 years ago*

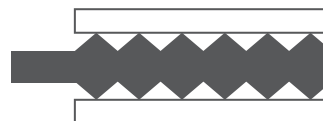
### ● **Camprofile Gaskets** - A good improvement in gasket strength

#### Advantages

- ✧ Strong, will not un-wind and will not crush
- ✧ Interchangeable with spiral-wound gaskets

#### Disadvantages

- ✧ Less elastic compared to spiral wound gaskets resulting in poor recovery
- ✧ Sharp teeth bite into flange surfaces causing damage and need to re-surface
- ✧ Not self-energized by fluid pressure



*NOW*

### ● **Fishbone™ Gaskets**

- ✧ Balance strength with flexibility
- ✧ Interchangeable with existing gaskets standards
- ✧ Will not damage flanges
- ✧ Uncrushable and does not unwind
- ✧ Extremely low minimum load requirements dramatically improve sealing performance



## ● The Fishbone™ Gasket Design & Advantages

### Design

- Helical concentric bevelled ribs, each side covered with Graphite, PTFE or Mica
- Unitary design with or without a centering ring
- Rounded, non-sharp contact surface
- Unique Stop-Step design

### Advantages

- Internally self-energized and by fluid pressure for better sealing performance
- Interchangeable with all spiral wound gaskets and Camprofile gaskets
- Will not damage flange like Camprofile gaskets and spiral wound gaskets
- Prevents over-compression of sealing element

### Change This



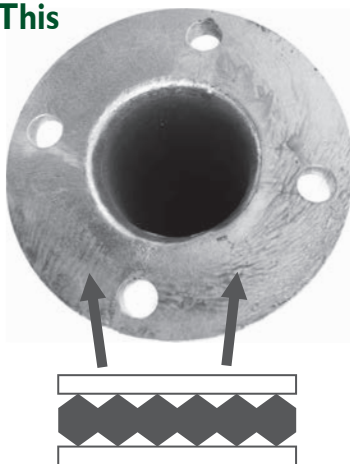
Unwound Spiral Wound Gaskets

### To This



Fishbone™ Gasket

### Change This



Camprofile Teeth Damaging Flange Face

### To This



Fishbone™ Gasket

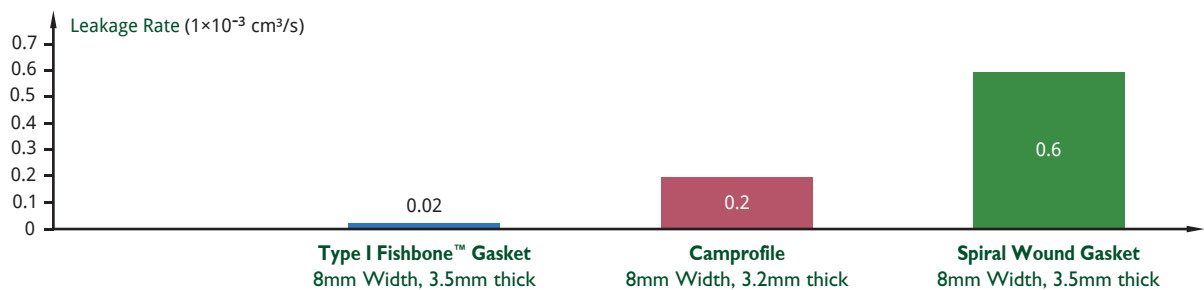


## ● Test Results

### Leakage Test - Fishbone™ Gasket vs. Spiral Wound vs. Camprofile

- Test Parameters (ASTM F37) Gasket Stress 30 MPa / 4351 psi | Nitrogen Pressure 4 MPa / 580 psi  
Test Report#: MF-130933 & MF-130935

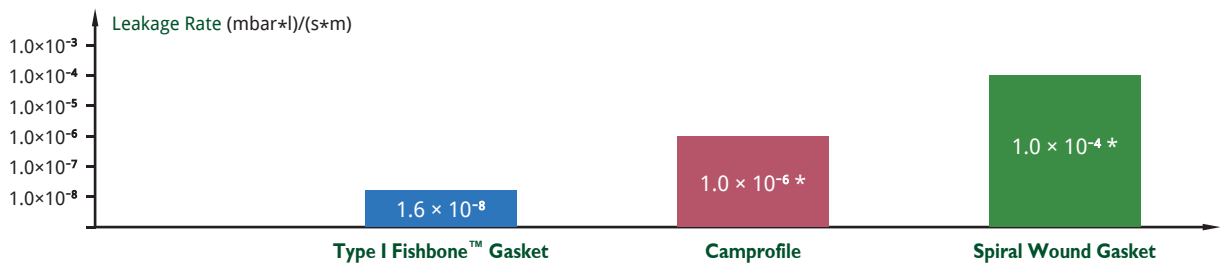
Test Item	Type I Fishbone™ Gasket 8mm Width, 3.5mm thick	Camprofile 8mm Width, 3.2mm thick	Spiral Wound Gasket 8mm Width, 3.5mm thick
Leakage Rate ( $1 \times 10^{-3}$ cm <sup>3</sup> /s)	0.02	0.2	0.6



### TA-LUFT Test - Fishbone™ Gasket vs. Spiral Wound vs. Camprofile

- Test Parameters – VDI Guideline 2440 & VDI Guideline 2200

Test Item	Type I Fishbone™ Gasket	Camprofile	Spiral Wound Gasket
Leakage Rate (mbar·l)/(s·m)	$1.6 \times 10^{-8}$	$1.0 \times 10^{-6}$ *	$1.0 \times 10^{-4}$ *



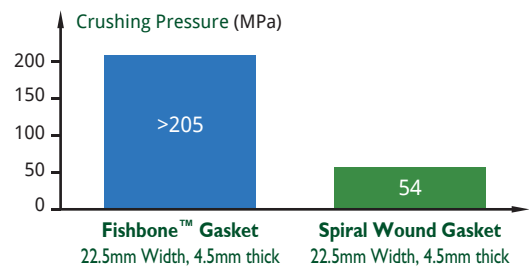
\*Average values from accredited international laboratory

**The Fishbone™ Gasket is considered to be of High Grade Performance according to TA-Luft.**

### Crush Resistance Test - Fishbone™ vs. Spiral Wound

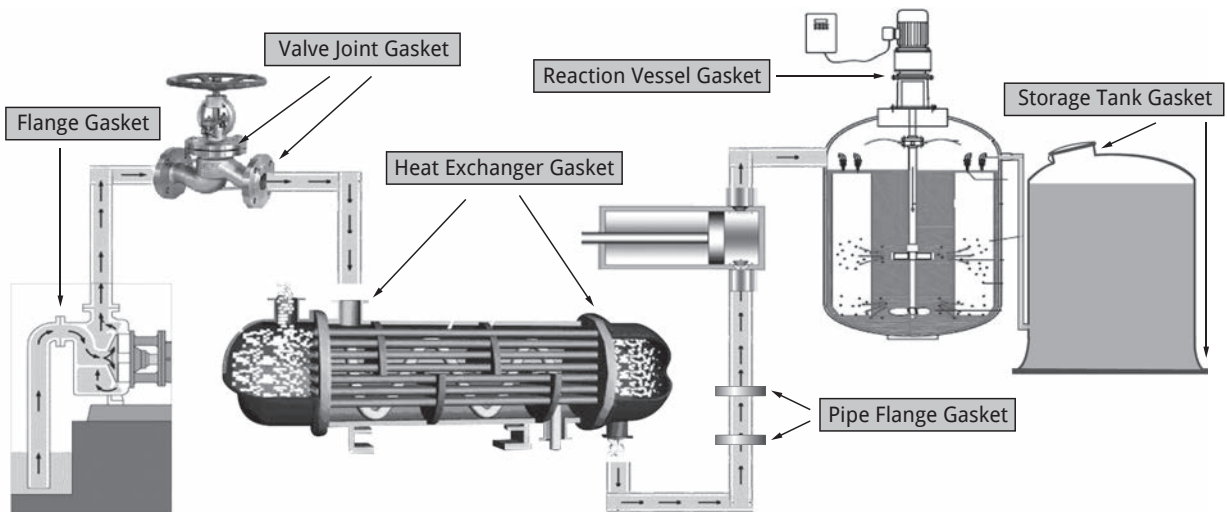
- Test Parameters Pressure 205 MPa / 29732 psi  
Test Report#: MF-130936

Test Item	Fishbone™ Gasket 22.5mm Width, 4.5mm thick	Spiral Wound Gasket 22.5mm Width, 4.5mm thick
Crushing Pressure (MPa)	>205	54



## Applications

- Critical Flange Applications
- Steam Sealing
- Direct Replacement of All Spiral Wound Gaskets and Camprofile Gaskets
- Low Emissions Sealing
- Fire Safe Requirements
- High Pressure Flanges
- Piping and Equipment



## Technical Specifications

### Standard Materials

- **Metal Materials**  
304, 304L, 316, 316L, 321
- **Non-metallic Sealing Materials**  
Flexible Graphite, PTFE, Mica

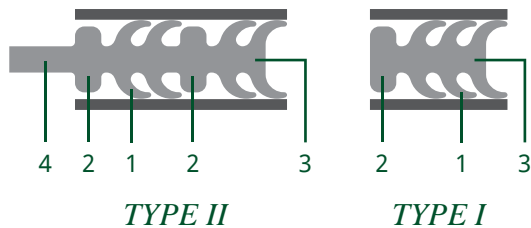
※ Other Materials on request

### Temperature Range

Facing Material	Minimum °C	Maximum °C	Minimum °F	Maximum °F
Flexible Graphite	-212	450	-350	850
PTFE	-240	260	-400	500
Mica	-212	1000	-350	1850

### Features

1. Patented helical concentric bevelled ribs.  
The number of ribs grows with the increasing pressure class.
2. Unique Stop-Step design  
Manufactured with single or double stop-steps depends upon the sealing width.
3. Self-energized by fluid pressure
4. Unitary design with (Type II) or without (Type I) a centering ring



## ● How to Order

### ● Standard Sizes

#### Imperial

NPS (in): 1/2" ~ 60"

CLASS (lbs): 150 ~ 2500

#### Metric

DN (mm): 10 ~ 2000

PN (bar): 2.5 ~ 400

### ● International Standard

EN 1514

ASME B16.20a

JIS B2404

EN 12560

ANSI B 16.21

JPI-7S-41

BS 4865

API 601

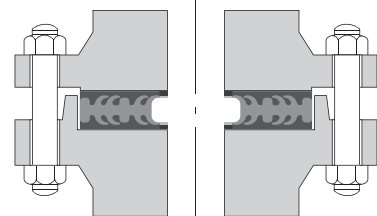
BS 3381

DIN 2690~2692

※ Please consult with AIGI Environmental Inc. for all your standard and non standard gasket requirements.

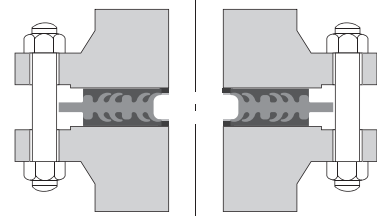
## Interchangeable

### *Basic Construction*



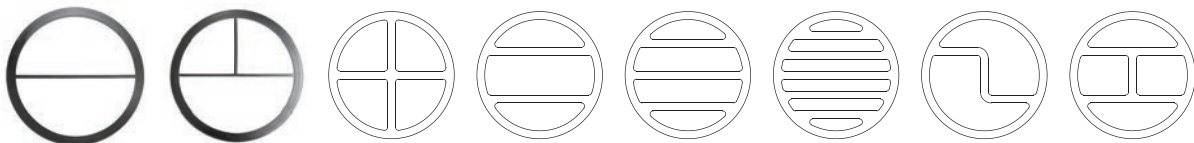
Replaces Spiral Wound Style R, Style RIR & Camprofile Basic Type

### *Centering Ring Construction*



Replaces Spiral Wound Style CG, Style CGI & Camprofile Reinforced Type

Heat Exchanger is available!



and more !



**AIGI ENVIRONMENTAL INCORPORATED**

— A Subsidiary of AIGI Group —

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