

TUF-FLEX®

Introducing a Technologically Advanced New Hygienic Seal

Tuf-Flex, the **revolutionary new hygienic seal** from Rubber Fab Technologies Group, is the **world's only unitized seal** setting new standards for **purity, performance and flexibility**. Designed to meet critical requirements in pharmaceutical, biotechnology, ultra-pure water, WFI (water-for-injection) and difficult food and beverage processing, **Tuf-Flex outperforms other hygienic seals while eliminating costly process interruptions.**

Performance Based on a Revolutionary Composition

A Tuf-Flex hygienic seal's contact surface is a layer of PTFE grafted to an EPDM rubber inner core. This **totally bonded construction** provides an **exceptionally pure and incredibly flexible seal.**

By grafting the elastomer with a layer of PTFE, **Tuf-Flex will behave like an elastomer but will prevent the product contamination, service interruptions and clean-up costs** associated with elastomer seals.



Performance With Exceptional Purity

Because its elastomer core is protected by a unitized layer of PTFE, Tuf-Flex hygienic seals will not **release elastomer extractables** or **particulates** totally **eliminating spalling**. The result is an **exceptionally maintained sanitary tubing I.D. with no I.D. invasiveness or system contamination.**

Achieve Higher Performance Under SIP/CIP Conditions

- Uniting the **flexibility** of an elastomer with the **chemical resistance** of PTFE
- **Seats perfectly**
- **Superior resistance to cold flow and creep**
- **Excellent chemical resistance**

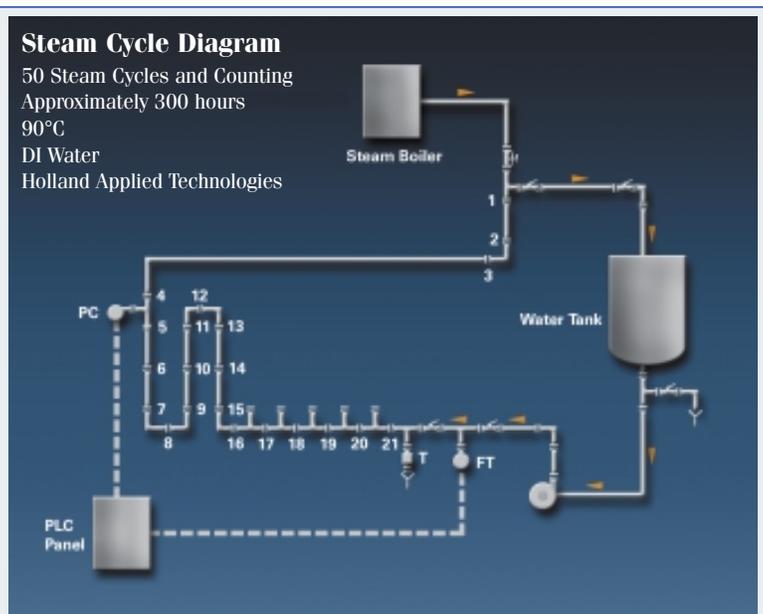
- **Leak-proof performance**
- **Outstanding service life**
- **Exceptional flexibility**

Tuf-Flex Is Ultra-Pure

- **No extractables, TOCs or particulates** to contaminate product stream
- **No-pigment**
- **No gasket I.D. invasion**
- **Exceptional cleanability response**
- **Non-stick surfaces**
- **Maintains seal @ 30 in./lbs.**
- **Temperature Range: -20°F to 400°F**

Tuf-Flex Prevents Process Interruptions

- **Perfect cleanability**
- **No re-torquing**
- **Up to 100 SIP cycles guaranteed**



TUF-FLEX Hygienic Seal Life Study

Product	Material	Durometer Before	Durometer After	I.D. Dia. Before	I.D. Dia. After
TUF-FLEX	PTFE	92	94	1.406	1.39
TUF-FLEX	EPDM	92	95	1.406	1.366

sani-tech west

321 Irving Drive
Oxnard, CA 93030
(800) 726-4835
www.sani-techwest.com

Type I and Type III Envelope Seals vs TUF-FLEX



A Solid PTFE Type I seal is guaranteed to fail in SIP conditions. They will creep, cold flow and leak at ΔT .



The Envelope seal construction provides **inconsistent** results between the two materials. It will also creep, cold flow and leak over time.



The PTFE grafted elastomer in a Tuf-Flex seal will maintain I.D. without re-torquing or leaking.

TUF-FLEX Hygienic Seal

Item	Unit	Spec.	"A" Type	"B" Type
Normal Condition Test				
Hardness	HS (JIS A)	80±5	82	77
Tensile Strength	M Pa	9.8 Min.	18.5	16.7
Elongation	%	150 Min.	160	310
Aging Test				
Hardness Change	POINTS	+5 Max.	+1	+2
Tensile Strength Change	%	-15 Max.	-3.2	-7.2
Elongation Change	%	-25 Max.	-11.6	-19.4
Compression Set Test				
Compression Set	%	+25 Max.	+7	+13

TUF-FLEX...The World's Only Unitized Hygienic Seal

1/2"	A42MPGR-TF-050-E
3/4"	A42MPGR-TF-075-E
1"	A40MPGR-TF-100-E
1-1/2"	A40MPGR-TF-150-E
2"	A40MPGR-TF-200-E
2-1/2"	A40MPGR-TF-250-E
3"	A40MPGR-TF-300-E
4"	A40MPGR-TF-400-E

Specify Tuf-Flex®, the World's Finest Hygienic Seal

- Unites the **flexibility** of an elastomer with the **chemical resistance** of PTFE.
- Up to 100 steam cycles guaranteed.
- **Totally unitized**, perfectly sealed.
- **Leak-proof performance**.
- Superior **creep resistance**.
- Excellent **chemical resistance**.
- Minimal thermal expansion.
- No re-torquing necessary.
- Outstanding service life.
- **Outstanding purity** – no extractables, TOCs or particulates.
- No gasket extrusion into the I.D.
- **Non-stick surfaces**.
- **No pigments**.
- Easy cleanability.

Tuf-Flex Meets Stringent Standards

- U.S. Pharmacopeia Class VI Certification
- Cytotoxicity Criteria
- Title 21 CFR 177.2600 and 177.1550
- USDA and 3-A Sanitary Standards
- Current Good Manufacturing Practices (CGMP)
- ASME-BPE Standards
- Animal Derived Ingredient Free

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* Buna is not an ADI Free elastomer.

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