



H.S. WHITE

CORPORATION

Marine and Industrial Specialists

FABRIC EXPANSION JOINTS TECHNICAL DATA



PRODUCT APPLICATIONS

Industrial applications can be separated into general categories based on the media composition (Air or Gas) and temperature. This section is designed to aid in the selection of the appropriate expansion joint for the specific application range. All plants are unique, therefore the service locations and temperatures may vary.

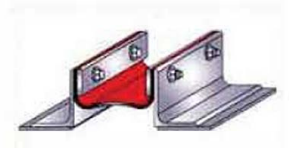
This section only serves as a guide and should be confirmed with a Unaflex® Sales Engineer.

Ambient Air Services (-40°F to 400°F)

Ambient air temperature clean air without particulate or chemicals to damage the flexible element. Expansion joint is used frequently for vibration and sound attenuation from fan equipment.

Locations for use:

- FD Fan Intake/Outlet • Primary Air Fan to Air Heater
- Service Air Intakes • Primary Air to Recovery Boiler
- Primary Air to Recovery Boiler



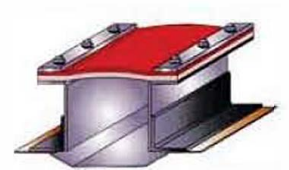
An integrally flanged elastomeric joint is suggested, using either the THERMA-FLEX or MIGHTY SPAN styles. Neoprene, EPDM or Viton® single layer belts are frequently used.

Hot Air Services (500°F to 800°F)

Clean air coming into contact with hot flue gases at the Air Pre-Heater where temperatures are elevated with minimal particulate and or gas carryover. Expansion joint will see thermal movements and vibration. Elevated temperatures require a composite flexible element and a flow liner.

Locations for use:

- Air Heater/Air Outlet • Over Fire Air Fans
- Secondary Air fan • Mill Air



A THERMA-FLEX flat composite belt with a bolt in or weld in frame design and a flow liner is suggested. The weld in outboard angle frame design with field welded flow liner (TWCP600VIFL) is shown.

Low to moderate temperature Flue Gas services (150°F to 600°F)

Flue gas which has passed through an air pre-heater and dust collector to reduce the temperature and particulate level. Flue gas may cycle near the dew point where condensation can occur and chemicals are present. Expansion joint may see thermal movements, vibration and chemical attack.

Locations for use:

- Precip. Outlet • I.D. Fan Inlet/Outlet
- Scrubber Inlet/Outlet • HRSG Inlet/Outlet
- Re-heater Inlet/Outlet



A single-layer belt with chemical barrier is suggested in either integrally flanged or flat belt type. Such as the THERMA-FLEX weld in outboard angle frame design and PTFE coated single layer belt with gas film layer (TWFP500TA) shown.

Hot Flue Gas Services (600°F to 1200°F)

Flue gas directly after combustion stage at elevated temperatures with possible particulate present. Expansion joint is used for possible large thermal movements at elevated temperatures.

Locations for use:

- Economizer Outlet • Cyclone Inlet/Outlet
- Precip. Inlet • Recovery Boiler Outlet
- Air Heater Gas Inlet/Outlet • Gas Recirculation System



THERMA-FLEX high temperature composite flat belt style setback frames, cavity pillow and flow liners are suggested. The standard "Z" frame design with telescoping flow liners (ZZWCP1000FPRP shown) or "J" frame with shop liner are two designs used in these applications.

EXPANSION JOINT DESIGN CONSIDERATIONS

Table: Typical Movement Chart

TYPE	ACTIVE LENGTH	AXIAL COMPRESSION	AXIAL EXTENSION	LATERAL MOVEMENT
Single Layer Elastomer or Fluoroplastic Flexible Element	06" (150mm)	2" (50mm)	1/2" (13mm)	+/- 1" (25mm)
	09" (230mm)	3" (75mm)	1/2" (13mm)	+/- 1 1/2" (38mm)
	12" (305mm)	4" (100mm)	1" (25mm)	+/- 2" (50mm)
	16" (405mm)	5" (125mm)	1" (25mm)	+/- 2 1/2" (63mm)
Composite Type Flexible Element	06" (150mm)	1" (25mm)	1/2" (13mm)	+/- 1/2" (13mm)
	09" (230mm)	2" (50mm)	1/2" (13mm)	+/- 1" (25mm)
	12" (305mm)	3" (75mm)	1" (25mm)	+/- 1 1/2" (38mm)
	16" (405mm)	4" (100mm)	1" (25mm)	+/- 2" (50mm)

Typical Setback Requirements

ACTIVE LENGTH	6" (150mm)	9" (230mm)	12" (305mm)	16" (405mm)
SETBACK: Flat Belt Positive Pressure	3" (75mm)	3" (75mm)	4" (100mm)	6" (150mm)
Flat Belt Negative Pressure	4" (100mm)	6" (150mm)	6" (150mm)	7" (175mm)
Integral Flange Positive Pressure	1" (25mm)	1 1/2" (38mm)	2" (50mm)	2 1/2" (63mm)
Integral Flange Negative Pressure	2" (50mm)	3" (75mm)	4" (100mm)	5" (125mm)

MATERIALS TECHNOLOGY IN THE DEVELOPMENT OF TODAY'S EXPANSION JOINTS

STANDARD BELT MATERIALS

(Material code refers to Continuous Operating Temperature Limit in degrees F.) Various single layer and composite belt materials are available and are selected based on the specific application temperatures and flow media characteristics. The following is a list of Unaflex's standard belt designs.



Single Layer: (EL or FPR)	EL200NP (NEOPRENE)	EL400VI (Flourelastomer-Viton®)
	EL300EP	FPR500TA&TB (Fluoropolymers-PTFE)

**Other elastomers are available in style 600 including FDA Materials

Composite (CP)	CP500VI	CP800VI	CP100VI	CPI200SI
	CP500SI	CP800SI	CP1000SI	CPI200FPR
	CP700TA	CP1000TA	CP1000FPR	CPI200GT

**Other composite buildups and covers are available per request up to 2000°F