Raybestos Manhattan High Temperature Expansion Joints

SuperSpan™

** This catalog has been put online by U.S. Bellows for historical reference purposes. U.S. Bellows is a manufacturer of SuperSpan equivalent expansion joints.
SuperSpan Features

Corners—Flanges
R/M uses an advanced construction with molded corners on Mark I, II, and III series. This gives complete integrity of both inner and outer exposed surfaces. There are no splices in corners. The fully molded design has built-in non-metallic integral flanges.

Shapes—Cross Sections
Round, square, rectangular, eccentric and reducing configuration fitting all basic requirements for industry today. Normally made with flanged cross section having maximum radius between body and flange. Flanges can be made in either direction. Can be furnished as an open end belt type without flanges for field splicing or endless belt type. Also can be made with convolute for special applications.

Vibration Isolation—Sound Dampening
SuperSpan joints isolate vibration and prevent sound transmission between ducting sections because metal to metal contact is eliminated.

Minimum Force For Movement
Dimensional changes in the metal ductwork during thermal expansion and contraction are accommodated with minimum force exerted on the SuperSpan joints.

In test after test and on-site application after application SuperSpan Expansion Joints out-perform both metal joints and all other non-rigid joints. SuperSpan High Temperature Expansion Joints are superior...

...TO METAL JOINTS:

Flexibility. SuperSpan joints move in any direction; axially, laterally and rotationally on "X", "Y", and "Z" axes. Metal moves either laterally or axially (1 way only).

Ability to take torsion. SuperSpan joints absorb twisting movements caused by differential heating of ducting.

Money savings. Usually one SuperSpan joint replaces two metal joints. Also, metal joints are generally too big to be shipped in one piece and must be assembled on the job. SuperSpan joints get to the job site complete, ready to go to work. Their light weight affords fast, easy installation. No crane necessary for most installations. Folded into a compact, lightweight package, their shipping costs are a fraction of charges for metal.

Easy replacement. Lightweight SuperSpan joints have built-in fabric flanges instead of metal flanges.

Field repairs. R/M’s experienced field crews respond quickly to problems. Minor damage can be handled by plant maintenance crews.

Noise reduction and vibration isolation. SuperSpan joints isolate vibration and prevent sound transmission between ducting sections because metal to metal contact is eliminated.

Margin of safety. SuperSpan joints accommodate errors in calculated movements and construction misalignments.

Corrosion resistant. Non-metallic SuperSpan joints resist corrosion in critical scrubber applications.

Minimum force for movement. Dimensional changes in the metal ductwork during thermal expansion and contraction are accommodated with minimum force exerted on the SuperSpan joints.

...TO OTHER NON-RIGID JOINTS:

Longer life. SuperSpan joints have tough, heavy multi-ply walled construction.

No gaskets needed. SuperSpan built-in fabric flanges act as gaskets and make easier, less expensive installation possible.

High heat protection. SuperSpan joints can handle temperatures up to 1200°F (649°C).

Corrosion resistant. The SuperSpan line includes a Teflon lined joint for critical corrosive applications.

Extra safety factor. SuperSpan large radius flanges take more movement and stress in extension.

Space age experience. R/M SuperSpan superiority is a direct result of work on aerospace materials.

Advanced construction. SuperSpan uses advanced-design molded corners on elastomeric joints. This gives complete integrity of both inner and outer exposed surfaces, and the fully molded design has built-in non-metallic integral flanges.

All configurations. Round, square, rectangular, eccentric and reducing shapes fit all requirements for industry. Usually made in flanged cross section with a maximum radius between body and flange. Flanges can be made in either direction. Also furnished as an open end belt without flanges for field splicing, endless belt or convolute for special applications.

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R/M uses combinations of these materials
to make SuperSpan expansion joints
for the specific requirements of the
high temperature inlet and outlet
connections of a wide variety of
equipment: precipitators, scrubbers,
air heaters, dust collectors, and
fans used in power plants, coke
plants, steel mills, cement plants,
paper mills, foundries, refineries and
the chemical process industry.
Each Mark number handles a specific
temperature range.
Equipment handling hot gases needs
expansion joints to compensate for
expansion and contraction and other
movements due to thermal cycling.

TFE (fluorocarbon) resin
is unaffected by almost all chemicals
even at elevated temperatures.
R/M has solved high temperature
corrosive problems in many applica-
tions by coating cloth with TFE
resins and films.

Elastomers
—neoprene, butyl and viton® (fluoro-
elastomer)—are used in R/M ex-
ansion joints. The choice is dictated
by temperature, the medium con-
tained, operating conditions as well
as other chemical and physical
requirements.

Asbestos, Silica, and
Ceramics
provide the most efficient heat re-
sistant textiles available, at
reasonable cost. R/M manufacturing
operation, and its finished products,
conform to OSHA requirements.

SuperSpan joints cost considerably
less than metal joints to ship
because they can be folded into a
compact, lightweight package.

Typical corrosive action on metal joints.

SuperSpan can handle single movements or combinations of A thru E
Viton® is a registered trademark of DuPont.

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U.S. Bellows is a manufacturer of SuperSpan equivalent expansion joints.
Mark I SuperSpan Joint
Neoprene-Asbestos
200° F (95° C) gas temperature and
±5 psig (34.5 kPa)

Service
The Mark I SuperSpan is designed for general service applications in
gas or air ducting systems for 200° F (93° C) continuous service and 250° F
(121° C) maximum.

Construction
The Mark I SuperSpan has a heavy
wall molded neoprene construction, reinforced
with two plies of asbestos cloth. This joint utilizes neoprene’s
excellent resistance to abrasion, sunlight and oil.
Built-in 3” (76.2mm) flanges and
molded corners make the joint easy
to install. The only metal used is in
back-up bars provided when re-
quested by the customer. Standard
size 2” x 3/8” (50.8mm x 9.5mm)
carbon steel. The Mark I is a tough,
lightweight unit. No internal baffles
are required.

In test after test and on-site application after application
SuperSpan Expansion Joints out-perform both metal joints
and all other non-rigid joints. SuperSpan High Temperature
Expansion Joints are superior . . .

. . . TO METAL JOINTS:
Flexibility. SuperSpan joints move in
any direction: axially, laterally and
rotationally on “X”, “Y”, and “Z”
axes. Metal moves either laterally or
axially (1 way only).

Ability to take torsion. SuperSpan
joints absorb twisting movements
caused by differential heating of
doing.

Money savings. Usually one
SuperSpan joint replaces two metal
joints. Also, metal joints are gener-
ally too big to be shipped in one
piece and must be assembled on the
job. SuperSpan joints get to the job
site complete, ready to go to work.
Their light weight affords fast, easy
installation. No crane necessary for
most installations. Folded into a
compact, lightweight package, their
shipping costs are a fraction of
charges for metal.

Easy replacement. Lightweight Super-
Span joints have built-in fabric
flanges instead of metal flanges.

Field repairs. R/M’s experienced
field crews respond quickly to
problems. Minor damage can be
handled by plant maintenance crews.

Noise reduction and vibration
isolation. SuperSpan joints isolate
vibration and prevent sound trans-
mission between ducting sections
because metal to metal contact is
eliminated.

Margin of safety. SuperSpan joints
accommodate errors in calculated
movements and construction
misalignments.

Minimum force for movement.
Dimensional changes in the metal
ductwork during thermal expansion
and contraction are accommodated
with minimum force exerted on
the SuperSpan joints.

. . . TO OTHER NON-RIGID
JOINTS:

Longer life. SuperSpan joints have
tough, heavy multi-ply walled
construction.

No gaskets needed. SuperSpan built-
in fabric flanges act as gaskets and
make easier, less expensive instal-
lation possible.

High heat protection. Mark I Super-
Span joints handle temperatures
up to 250° F (121° C).

Extra safety factor. SuperSpan
large radius flanges take more move-
ment and stress in extension.

Space age experience. R/M Super-
Span superiority is a direct result of
work on aerospace materials.

Advanced construction. SuperSpan
uses advanced-design molded
corners on elastomeric joints. This
gives complete integrity of both
inner and outer exposed surfaces,
and the fully molded design has built-
in non-metallic integral flanges.

All configurations. Round, square,
rectangular, eccentric and reducing
shapes fit all requirements for
industry. Usually made in flanged
cross section with a maximum radius
between body and flange. Flanges
can be made in either direction. Also
furnished as an open end belt without
flanges for field splicing or endless
belt for special applications.

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U.S. Bellows is a manufacturer of SuperSpan equivalent expansion joints.
Sizes Available
Rectangular: 1 ft. x 1 ft. (305mm x 305mm) to over 60 ft. (18.3m) as needed.
Round: 1 ft. (305mm) to over 16 ft. (488mm) diameter.
Face to face sizes: Standard 9" (229mm) 12" (305mm), 16" (406mm) 3" (76.2mm) flange integrally molded. Other dimensions available.

Applications
The Mark I SuperSpan joint will give excellent performance in power plant forced draft air systems, process plants, paper mills, steel mills, foundries, cement plants and wherever ducting systems are handling air and gases to 250°F (121°C).

Temperature/Pressure Parameters
R/M Mark I SuperSpan joint can handle the following typical service conditions:

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Max.</th>
<th>Min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>+200°F (93.3°C)</td>
<td>-40°F (-40°C)</td>
</tr>
<tr>
<td>Pressure</td>
<td>+5 psig (34.5 kPa)</td>
<td>-5 psig (-34.5 kPa)</td>
</tr>
<tr>
<td>(Vacuum)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Weight
Per linear unit of joint:
9" (229mm) Aprpr. 2.2 lb./ft. (3.27 kg/m)
12" (305mm) 2.6 lb./ft. (3.87 kg/m)
16" (406mm) 3.3 lb./ft. (4.91 kg/m)
Per linear unit of 21/4" x 3/4" (50 x 9.5mm) back-up bars:
Approx. 5 lbs./ft. (7.43 kg/m)

Movements & Dimensions
Under some conditions the R/M Mark I SuperSpan joint can handle movements greater than those indicated. Refer all details to R/M for recommendations. Any unusual conditions should be worked out with R/M representative. Engineering aid readily available from factory and field representatives.

Face to face dimensions of manufactured joints:
9" (229 mm) 12" (305 mm) 16" (406 mm)

Recommended installation in breach:
Flange to flange in precompressed attitude:
81/4" 11" 15"
216 (279 (381)

(216 (279 (381)

Axial compression from installed position: Normal:
2 1/4" 3 3/4" 4 1/4"
63.5 (88.9 (114.3)

Working range: mm mm mm

Axial extension:
1/2" 1" 1"
12.7 (25.4 (25.4)

Normal working range:
mm mm mm

Lateral offset:
2 1/4" 3 3/4" 4 1/4"
63.5 (88.9 (114.3)

mm mm mm

Set-back
1" (25.4mm)
3" (76.2mm)

Typical rectangular joint corner

RM Industrial Products Co.
A division of Raybestos Manhattan Inc.
North Charleston, S.C. 29406
Energy Products Group

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Mark II SuperSpan Joint
Butyl-Asbestos
300°F (149°C) gas temperature and
±5 psig (34.5 kPa)

Service
The Mark II SuperSpan utilizes the valuable characteristics of resin cured butyl: high resistance to hot air and non-oily flue gases, and weatherability. It withstands the acid attack of fly ash deposits and scrubber treated gases in power generating service. Designed for continuous service to 300°F (149°C) and 5 psig (34.5 kPa).

Construction
The Mark II SuperSpan has a tough heavy wall construction consisting of two butyl coated plies of asbestos cloth.
The joint has built-in 3” (76.2mm) flanges and molded corners for ease and simplicity of installation. The only metal used is in the back-up bars.
The Mark II is a rugged, lightweight expansion joint. No internal baffles are required.

In test after test and on-site application after application SuperSpan Expansion Joints out-perform both metal joints and all other non-rigid joints. SuperSpan High Temperature Expansion Joints are superior ...

... TO METAL JOINTS:
Flexibility. SuperSpan joints move in any direction; axially, laterally and rotationally. Metal moves either laterally or axially (1 way only). 
Ability to take torsion. SuperSpan joints absorb twisting movements caused by differential heating of ducting.
Money savings. Usually one SuperSpan joint replaces two metal joints. Also, metal joints are generally too big to be shipped in one piece and must be assembled on the job. SuperSpan joints get to the job complete, ready to go to work. Their light weight affords fast, easy installation. No crane necessary for most installations. Folded into a compact, lightweight package, their shipping costs are a fraction of charges for metal.
Easy replacement. Lightweight SuperSpan joints have build-in fabric flanges instead of metal flanges.
Field repairs. R/M’s experienced field crews respond quickly to problems. Minor damage can be handled by plant maintenance crews.
Noise reduction and vibration isolation. SuperSpan joints isolate vibration and prevent sound transmission between ducting sections because metal to metal contact is eliminated.
Margin of safety. SuperSpan joints accommodate errors in calculated movements and construction misalignments.
Corrosion resistant. Non-metallic SuperSpan joints resist corrosion in critical scrubber applications.
Minimum force for movement. Dimensional changes in the metal ductwork during thermal expansion and contraction are accommodated with minimum force exerted on the SuperSpan joints.

... TO OTHER NON-RIGID JOINTS:
Longer life. SuperSpan joints have tough, heavy multi-ply walled construction.
No gaskets needed. SuperSpan build-in fabric flanges act as gaskets. Usually require fewer bolts and make possible easier, less expensive installation.
High heat protection. Mark II SuperSpan joints can handle temperatures up to 300°F (149°C).
Extra safety factor. SuperSpan large radius flanges take more movement and stress in extension.
Space age experience. R/M SuperSpan superiority is a direct result of work on aerospace materials.
Advanced construction. SuperSpan uses advanced-design molded corners on elastomeric joints. This gives complete integrity of both inner and outer exposed surfaces, and the fully molded design has build-in non-metallic integral flanges.
All configurations. Round, square, rectangular, eccentric and reducing shapes fit all requirements for industry. Usually made in-flanged cross section with a maximum radius between body and flange. Flanges can be made in either direction. Also furnished as an open end belt without flanges for field splicing or endless belt for special applications.
Sizes Available
Rectangular: 1 ft x 1 ft. (305mm x 305mm) to over 60 ft. (18.3m) as needed.
Round: 1 ft. (305mm) to over 16 ft. (4.88m) diameter.
Face to face sizes: Standard 9" (229mm), 12" (305mm), 16" (406mm)
3" (76.2mm) flange integrally molded. Other special dimensions available.

Applications
The Mark II SuperSpan joint can be used in power plant flue exhaust breaching systems as well as forced draft air systems, in process plants, paper mills, steel mills, foundries, cement mills and wherever ducting systems are handling air or gases of 300°F (149°C) continuous temperature.

Temperature/Pressure Parameters
R/M Mark II style expansion joint can handle the following typical service conditions:

<table>
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<tr>
<th>Temperature</th>
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<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>+300°F</td>
<td>-40°F</td>
<td>(+149°C)</td>
</tr>
</tbody>
</table>

Pressure:
+5 psig      -5 psig
(34.5 kPa)  (-34.5 kPa) (Vacuum)

Movements & Dimensions
Under some conditions the R/M Mark II SuperSpan joint can handle movements greater than those indicated. Refer all details to R/M for recommendations. Any unusual conditions may be worked out with R/M representative. Engineering aid readily available from factory and field representatives.

Face to face dimensions of manufactured joints.
9" (229mm) (229 mm)
12" (305mm) (305 mm)
16" (406mm) (406 mm)

Recommended installation in breach
precompressed flange to flange in 8½" (216 mm)
11" (279 mm)
15" (381 mm)

Axial compression
from installed position: Normal working range.
2½" (63.5 mm) 3½" (88.9 mm) 4½" (114.3 mm)

Axial extension:
1½" (12.7 mm) 1" (25.4 mm)

Normal working range:
2½" (63.5 mm) 3½" (88.9 mm)
4½" (114.3 mm)

Weight
Per linear unit of joint:
9" (229mm) Appr. 2.2 lb./ft. (3.27 kg/m)
F/F
12" (305mm) 2.6 lb./ft. (3.87 kg/m)
F/F
16" (406mm) 3.3 lb./ft. (4.91 kg/m)
F/F

Per linear unit of 2" x ¾" (50 x 9.5mm) back-up-bars:
Approx. 5 lbs./ft. (7.43 kg/m) of periphery of expansion joint.

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Mark III SuperSpan Joint

Viton®-asbestos
400°F (204°C) gas temperature and
±5 psig (34.5 kPa)

Service
The Mark III SuperSpan was designed for continuous service up to 400°F (204°C) and excursions to 600°F (315.6°C) max. for short periods and ±5 psig (34.5 kPa) pressure.

Viton® (fluoroelastomer) has excellent resistance to mineral acids and oils, and has high weatherability. It resists acid fly ash deposits in power generating service.

Construction
The Mark III SuperSpan is constructed of two plies of fabric reinforced Viton® vulcanized to form a homogeneous tough, heavy wall joint.

Mark III has built-in 3” (76.2mm) flanges and molded corners for easy, simple installation. No internal baffles are needed.

In test after test and on-site application after application SuperSpan Expansion Joints out-perform both metal joints and all other non-rigid joints. SuperSpan High Temperature Expansion Joints are superior...

...TO METAL JOINTS:
Flexibility. SuperSpan joints move in any direction; axially, laterally and rotationally on “X”, “Y”, and “Z” axes. Metal moves either laterally or axially (1 way only).

Ability to take torsion. SuperSpan joints absorb twisting movements caused by differential heating of ducting.

Money savings. Usually one SuperSpan joint replaces two metal joints. Also, metal joints are generally too big to be shipped in one piece and must be assembled on the job. SuperSpan joints get to the job site complete, ready to go to work. Their light weight affords fast, easy installation. No crane necessary for most installations. Folded into a compact, lightweight package, their shipping costs are a fraction of charges for metal.

Easy replacement. Lightweight SuperSpan joints have built-in fabric flanges instead of metal flanges.

Field repairs. R/M’s experienced field crews respond quickly to problems. Minor damage can be handled by plant maintenance crews.

Noise reduction and vibration isolation. SuperSpan joints isolate vibration and prevent sound transmission between ducting sections because metal to metal contact is eliminated.

Margin of safety. SuperSpan joints accommodate errors in calculated movements and construction misalignments.

Corrosion resistant. Non-metallic SuperSpan joints resist corrosion in critical scrubber applications.

Minimum force for movement. Dimensional changes in the metal ductwork during thermal expansion and contraction are accommodated with minimum force exerted on the SuperSpan joints.

...TO OTHER NON-RIGID JOINTS:
Longer life. SuperSpan joints have tough, heavy multi-ply walled construction.

No gaskets needed. SuperSpan built-in fabric flanges act as gaskets. Usually require fewer bolts and make possible easier, less expensive installation.

High heat protection. Mark III SuperSpan joints can handle temperatures up to 400°F (204°C).

Corrosion resistant. The SuperSpan Mark III is ideal for critical corrosive applications.

Extra safety factor. SuperSpan large radius flanges take more movement and stress in extension.

Space age experience. R/M SuperSpan superiority is a direct result of work on aerospace materials.

Advanced construction. SuperSpan uses advanced-design molded corners on elastomeric joints. This gives complete integrity of both inner and outer exposed surfaces, and the fully molded design has built-in non-metallic integral flanges.

All configurations. Round, square, rectangular, eccentric and reducing shapes fit all requirements for industry. Usually made in flanged cross section with a maximum radius between body and flange. Flanges can be made in either direction. Also furnished as an open end bell without flanges for field splicing or endless bell for special applications.
Sizes Available
Rectangular: 1 ft. x 1 ft. (305mm x 305mm) to over 60 ft. (18.3m) as needed
Round: 1 ft. (305mm) to over 16 ft. (4.86m) diameter
Face to face sizes: Standard 9" (229mm), 12" (305mm), 16" (406mm)
3" (76.2mm) flange integrally molded. Other special dimensions available.

Applications
The Mark III SuperSpan was developed for power plant flue exhaust systems from air heater outlet to the stack inlet as well as for use in process plant, paper mill, steel mill, foundry, cement mill, refinery and chemical plant applications.

Temperature/Pressure Parameters
R/M Mark III SuperSpan joints can handle the following typical service conditions:

Temperature: Max. Min.
+400°F (-40°F) (204°C) (-40°C)
Pressure: +6 psig -5 psig (34.5 kPa) (-34.5 kPa) (Vacuum)

*These are operating temperatures. Viton®-asbestos joints can handle short term excursions beyond 400°F (204°C) where upset conditions are encountered. This is a time-temperature relationship with Viton® capable of handling 450°F (232°C) for 3000 hours, 500°F (260°C) for 1000 hours, 550°F (283°C) for 240 hours and 600°F (316°C) for 48 hours.

Movements & Dimensions
Under certain conditions the R/M Mark III SuperSpan joint can handle movements greater than those indicated. Refer all details to R/M for recommendations. Any unusual conditions may be worked out with R/M representative. Engineering aid readily available from factory and field representatives.

Face to face dimensions of manufactured joints.
9" (229 mm) (305) (406)
12" (216) (279) (381)
16" (216) (279) (381)

Recommended installation in breach:
flange to flange in precompressed attitude.
8½" (219) (229) (318)
11" (279) (328)
15" (381) (508)

Axial compression from installed position: Normal working range:
2½" (63.5) (86.9) (114.3)
3½" (86.9) (114.3)
4½" (114.3)

Lateral offset: 2½" (63.5) (86.9) (114.3)
3½" (86.9) (114.3)
4½" (114.3)

Weight
Per linear unit of Mark III 9" (229mm) Appr. 3.5 lbs./ft.
12" (305mm) 4.2 lbs./ft.
16" (406mm) 5.1 lbs./ft.
Per linear unit of 2" x ½" (50 x 9.5mm) back-up bars:
Appr. 5 lbs./ft. (1.43 kg/m) of periphery of expansion joint.

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Modified Mark V
SuperSpan Joint

Coated asbestos insulated joint similar to the Mark V construction. 550°F (288°C) gas temperature and ±2 psig (13.8 kPa) by using a Teflon® coated inner liner. Used primarily on the cool side of the flue gas system from the air heater outlet to the stack inlet.

A Modified Mark V SuperSpan joint can be used in place of the Mark III type joint in the same temperature range as Mark III or a Modified Mark V can be used at higher temperatures, 550°F (288°C) and short excursions or upset temperatures to 750°F (399°C). As with standard Mark V, internal baffles are recommended.

Construction

Construction of the Modified Mark V SuperSpan is a thick, soft thermal barrier sandwiched between two plies of high grade asbestos fabric. The outer cover can be a Viton® or Butyl coated asbestos cloth depending on the application. The inside ply is a special TFE/glass laminate.

The Modified Mark V SuperSpan joint can be made with built-in flanged ends or belt type sleeves or any required face-to-face dimensions in round, square, rectangular, eccentric and reducing configurations. This design is the extremely lightweight and easy to install. Nearly zero stress is needed for movement. No load is placed on mating equipment. No external insulation is needed since insulation is bound into the sandwiched construction. As with standard Mark V, internal baffles are recommended to protect the inner liner from the abrasive effects of the particulates.

In test after test and on-site application after application SuperSpan Expansion Joints out-perform both metal joints and all other non-rigid joints. SuperSpan High Temperature Expansion Joints are superior.

... TO METAL JOINTS:

Flexibility. SuperSpan joints move in any direction; axially, laterally and rotationally on "X", "Y", and "Z" axes. Metal moves either laterally or axially (1 way only).

Ability to take torsion. SuperSpan joints absorb twisting movements caused by differential heating of ducting.

Money savings. Usually one SuperSpan joint replaces two metal joints. Also, metal joints are generally too big to be shipped in one piece and must be assembled on the job. SuperSpan joints get to the job site complete, ready to go to work. Their lightweight absorbs fast, easy installation. No crane necessary for most installations. Folded into a compact, lightweight package, their shipping costs are a fraction of charges for metal.

Easy replacement. Lightweight SuperSpan joints have built-in fabric flanges instead of metal flanges.

Field repairs. R/M's experienced field crews respond quickly to problems. Minor damage can be handled by plant maintenance crews.

Noise reduction and vibration isolation. SuperSpan joints isolate vibration and prevent sound transmission between ducting sections because metal to metal contact is eliminated.

Margin of safety. SuperSpan joints accommodate errors in calculated movements and construction misalignments.

Corrosion resistant. Non-metallic SuperSpan joints resist corrosion in critical scrubber applications.

Minimum force for movement. Dimensional changes in the metal ductwork during thermal expansion and contraction are accommodated with minimum force exerted on the SuperSpan joints.

... TO OTHER NON-RIGID JOINTS:

Longer life. SuperSpan joints have tough, heavy multi-ply walled construction.

No gaskets needed. SuperSpan built-in fabric flanges act as gaskets. Usually require few bolts and make possible easier, less expensive installation.

High heat protection. Modified Mark V SuperSpan joints can handle temperatures up to 600°F (315°C).

Corrosion resistant. SuperSpan includes a Teflon lined joint for critical corrosive applications.

Extra safety factor. SuperSpan large radius flanges take more movement and stress in extension.

Space age experience. R/M SuperSpan superiority is a direct result of work on aerospace materials.

All configurations. Round, square, rectangular, eccentric and reducing shapes fit all requirements for industry. Usually made in flanged cross section with a maximum radius between body and flange. Flanges can be made in either direction. Also furnished as an open end belt without flanges for field splicing or endless belt for special applications.

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Sizes Available

Rectangular: 1 ft. x 1 ft. (305mm x 305mm) to over 100 ft. (30.5m) as required.
Round: 6" (152mm), 12" (305mm), 16" (406mm).
3" (76.2mm) flange integrally built in.
R/M engineering will make recommendations of other sizes.

Applications

The Modified Mark V SuperSpan Joint is excellent in power generating plants in flue gas systems from the air heater outlet to the stack inlet, having continuous temperatures up to 550°F (288°C), when short excursions or upset temperatures to 750°F (398°C) would be encountered.
It is used on high temperature exhaust or systems in process plants, paper mills, steel mills, foundries, cement mills, and in refinery and chemical plant applications using scrubbers and precipitators in breaching systems. It is used for vibration isolation of forced draft and induced draft fans. The Modified Mark V SuperSpan can handle large movements in axial, lateral and torsional directions and needs virtually zero stress to flex, eliminating unwanted external loads on equipment.

Temperature/Pressure Parameters

R/M Modified Mark V SuperSpan joint can handle the following typical service conditions:
Temperature: Max. +500°F (-240°C) -40°F (-40°C)
Pressure: +2 psig (13.8 kPa) -2 psig (13.8 kPa) (Vacuum)

Movements & Dimensions

The table below is a guide under which the expansion joint can safely operate.
Under some conditions the R/M Modified Mark V SuperSpan joint can handle movements greater than those indicated. Refer all details to R/M for recommendations. Any unusual conditions may be worked out with R/M representative. Engineering aid readily available from factory and field representatives.

Face to face dimensions
9" (229) 12" (305) 16" (406) mm mm mm
of manufactured joints (229) (305) (406)
Recommended installation in breach of flange in ½" (15) mm
precompressed (216) (279) (381) mm
at attitude (216) (279) (381) mm
Axial compression from installed position: Normal (50.8) (76.2) (114.3) mm
working range (50.8) (76.2) (114.3) mm
Axial extension: ½" (12.7) (25.4) mm
Normal working range (25.4) (51.4) mm
Lateral offset: ½" (12.7) (25.4) mm
(63.5) (89.9) (114.3) mm

Weight

Per lineal unit of joint:
9" (229mm) 3.13 lbs./ft. (1.43 kg/m)
12" (305mm) 3.75 lbs./ft. (1.75 kg/m)
16" (406mm) 4.58 lbs./ft. (2.11 kg/m)
Per lineal unit of 2" x ½" (50.8 x 12.7mm) back-up bars:
Approx. 5 lbs./ft. (7.44 kg/m) of periphery of expansion joint.

** This catalog has been put online by U.S. Bellows for historical reference purposes. U.S. Bellows is a manufacturer of SuperSpan equivalent expansion joints.
Mark V SuperSpan
coated asbestos insulated joint
1000°F (538°C) gas temperature and
±2 psig (13.8 kPa)

Service
The Mark V SuperSpan handles
difficult high temperature applica-
tions: flue and exhaust gases at
temperatures up to 1000°F (538°C).

Construction
Construction of the Mark V
SuperSpan is a thick, soft thermal
barrier sandwiched between a ply of
high grade asbestos fabric, a TFE/
glass laminate and a layer of silica
cloth. This composite is enclosed
in a Viton® reinforced outer cover.
The Mark V SuperSpan joint can
be made with built-in flanged ends or
belt type sleeves of any required
face-to-face dimensions in round,
square, rectangular, eccentric and
reducing configurations. This design
is extremely lightweight and easy to
install. Nearly zero stress is needed
for movement. No load is placed
on mating equipment. No external
insulation is needed since insulation
is built into the sandwiched joint.

Internal baffles of carbon steel,
Cor-Ten® or stainless steel are rec-
commended for the Mark V when
particles are in exhaust gases.

In test after test and on-site application after application
SuperSpan Expansion Joints out-perform both metal joints
and all other non-rigid joints. SuperSpan High Temperature
Expansion Joints are superior . . .

... TO METAL JOINTS:
Flexibility. SuperSpan joints move in
any direction; axially, laterally and
rotationally on "X", "Y", and "Z"
axes. Metal moves either laterally or
axially (1 way only).

Ability to take torsion. SuperSpan
joints absorb twisting movements
caused by differential heating of
ducting.

Money savings. Usually one
SuperSpan joint replaces two metal
joints. Also, metal joints are gener-
tally too big to be shipped in one
piece and must be assembled on the
job. SuperSpan joints get to the job
site complete, ready to go to work.
Their light weight affords fast, easy
installation. No crane necessary for
most installations. Folded into a
compact, lightweight package, their
shipping costs are a fraction of
charges for metal.

Easy replacement. Lightweight Super-
Span joints have built-in fabric
flanges instead of metal flanges.

Field repairs. R/M's experienced
field crews respond quickly to prob-
lems. Minor damage can be handled
by plant maintenance crews.

Noise reduction and vibration
isolation. SuperSpan joints isolate
vibration and prevent sound trans-
mission between ducting sections
because metal to metal contact is
eliminated.

Margin of safety. SuperSpan joints
accommodate errors in calculated
movements and construction
misalignments.

Corrosion resistant. Non-metallic
SuperSpan joints resist corrosion in
critical scrubber applications.

Minimum force for movement.
Dimensional changes in the metal
ductwork during thermal expansion
and contraction are accommodated
with minimum force exerted on
the SuperSpan joints.

... TO OTHER NON-RIGID
JOINTS:
Longer life. SuperSpan joints have
tough, heavy multi-ply walled
construction.

No gaskets needed. SuperSpan built-
in fabric flanges act as gaskets.
Usually require fewer bolts and make
possible easier, less expensive
installation.

High heat protection. Mark V Super-
Span joints can handle temperatures
up to 1000°F (538°C).

Corrosion resistant. The SuperSpan
Mark V includes an inner ply of silica
cloth and a TFE/glass moisture
barrier for critical corrosive applica-
tions.

Extra safety factor. SuperSpan
large radius flanges take more move-
ment and stress in extension.

Space age experience. R/M Super-
Span superiority is a direct result of
work on aerospace materials.

All configurations. Round, square,
rectangular, eccentric and reducing
shapes fit all requirements for
industry. Usually made in flanged
cross section with a maximum radius
between body and flange. Flanges
can be made in either direction. Also
furnished as an open end belt without
flanges for field splicing or endless
belt for special applications.

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U.S. Bellows is a manufacturer of SuperSpan equivalent expansion joints.
Sizes Available
Rectangular: 1 ft. x 1 ft. (305mm x 305mm) to over 100 ft. (30.5m) as required.
Round: 6" (152mm) diameter to over 100 ft. (30.5m) as required.
Face to face sizes: As required.
Standard 9" (229mm), 12" (305mm), 16" (406mm)
4" (101.6mm) flange integrally built in molded. R/M engineering will make
recommendations on other sizes.

Applications
The Mark V SuperSpan Joint is
excellent in power generating plants
in fluid gas systems from the
economizer outlet to the air heater
inlet having continuous temperatures
up to 1000°F (538°C) and from the
air heater outlet to the stack inlet,
when extended excursions or upset
temperatures above 500°F (288°C)
would be encountered. It is used on
high temperature exhaust gas systems
in process plants, paper mills,
steel mills, foundries, cement mills,
and in refinery and chemical plant
applications using scrubbers and
precipitators in breeching systems.
It is used for vibration isolation of
forced draft and induced draft fans.
The Mark V SuperSpan can handle
large movements in axial, lateral and
torsional or angular directions and
needs virtually zero stress to flex,
eliminating unwanted external
loads on equipment.

Temperature/Pressure
Parameters
R/M Mark V SuperSpan joint can
handle the following typical service
conditions:
Temperature: Max. 1000°F (-409°C)
Min. (-40°F)
Pressure: +2 psig (-13.8 kPa)
(13.8 kPa) (Vacuum)

 Movements & Dimensions
The table below is a guide under
which the expansion joint can safely
operate.
Under some conditions the R/M
Mark V SuperSpan joint can
handle movements greater than
those indicated. Refer all details to
R/M for recommendations. Any
unusual conditions may be worked
out with R/M representative. Engi-
neering aid readily available from
factory and field representatives.

Face to face
dimensions
9" 12" 16"
of manufactured
(229) (305) (406)
joints. (mm) (mm) (mm)
Recommended
installation in breach
flange to flange in
8½" 11" 15"
precompressed
(216) (279) (381)
attitude (mm) (mm) (mm)
Axial compression
from installed
position: Normal
working range.
(50.8) (76.2) (114.3)
(mm) (mm) (mm)
Axial extension:
½" 1" 1"
Normal working
range.
(12.7) (25.4) (25.4)
(mm) (mm) (mm)
Lateral offset:
2½" 3½" 4½"
(63.5) (88.9) (114.3)
(mm) (mm) (mm)

Weight
Per lineal unit of joint:
9" (229mm) 3.31 lbs./ft. (4.93 kg/m)
F/F
12" (305mm) 3.88 lbs./ft. (5.92 kg/m)
F/F
16" (406mm) 4.86 lbs./ft. (7.23 kg/m)
F/F
Per lineal unit of 2" x ¾" (50.8 x
9.5mm) back-up bars:
Approx. 5 lbs./ft. (7.44 kg/m) of
periphery of expansion joint.

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manufacturer of SuperSpan equivalent expansion
joints.

Industrial Products Co.
A division of Raybestos Manhattan Inc.
North Charleston, S.C. 29406

Energy Products Group
Form 98205
Printed in U.S.A.
Recommended Method of Insulating Duct Flanges When Installing Mark V and Modified Mark V Expansion Joints

It is important to keep the temperature of the outside surface of the Mark V expansion joint below 400°F (204°C) in order to prevent the use of Viton® fluoroelastomer cover which acts as the final gas seal.

Normal outside skin temperatures of a Mark V joint used between the economizer outlet and the air heater inlet will be 130°F to 180°F (54°C to 82°C) where operating gas temperatures are 650°F to 800°F (343°C to 427°C). Outside heat sources or areas where heat can be trapped because of inadequate air movement can cause excessive heat buildup also where back-up bar bolts are exposed to high heat areas excessive heat can be conducted through the bolt to the back-up bars.

1. **Expansion Joint is NOT to be Insulated on the Outside.**

2. **The Insulation Should NOT COVER the Expansion Joint Bolts on the Duct Flange Side.**

3. Any protective cover over the expansion joint must be perforated to allow free air flow over the outside of the joint. Suggested cover is heavy gauge open screening or grating.

4. If expansion joint is located in area of high outside heat or area where there will be no air flow over the joint, contact R/M for installation evaluation.

5. If expansion joint is located in a pocket where ambient heat can exceed outside cover design temperature, customer must provide fans or other means to lower temperature.

**Outside Cover Design Temperatures cannot be greater than:****
- Viton®- 400°F (204°C)
- Gasket-300°F (149°C)

6. When using Mark V (Modified) and applications of Mark V Joints, R/M will recommend the use of insulation mat on high temperature applications where additional protection is necessary.
Mark VI SuperSpan
coated asbestos insulated joint
1200° F (649° C) gas temperature and
12 psig (13.8 kPa)

Service
The Mark VI SuperSpan handles the most difficult high temperature applications: flue and exhaust gases at temperatures up to 1200° F (649° C). Most advanced of all six styles. Use primarily as a sleeve adjacent to the Combustion chamber, economizer and turbine exhaust.

Construction
Construction of the Mark VI SuperSpan is a thick soft thermal barrier sandwiched between a ply of inconel wire reinforced asbestos and a ply of ceramic fabric. The outer cover is Viton® coated asbestos cloth.

The Mark VI SuperSpan joints are built as belt type sleeves of any required face-to-face dimensions in round, square, rectangular, eccentric and reducing configurations. This design is extremely lightweight and easy to install. Nearly zero stress is needed for movement. No load is placed on mating equipment. No external insulation is needed since insulation is built into the sandwiched joint.

Internal baffles are recommended with this construction. (See illustrations of various inside baffle arrangements.)

Internal baffles are recommended with this construction. (See illustrations of various inside baffle arrangements in Mark V Section.)

In test after test and on-site application after application SuperSpan Expansion Joints out-perform both metal joints and all other non-rigid joints. SuperSpan High Temperature Expansion Joints are superior...

... TO METAL JOINTS:

Flexibility. SuperSpan joints move in any direction, axially, laterally and rotationally on “X”, “Y”, and “Z” axes. Metal moves either laterally or axially (1 way only).

Ability to take torsion. SuperSpan joints absorb twisting movements caused by differential heating of ducting.

Money savings. Usually one SuperSpan joint replaces two metal joints. Also, metal joints are generally too big to be shipped in one piece and must be assembled on the job. SuperSpan joints get to the job site complete, ready to go to work. Their light weight affords fast, easy installation. No crane necessary for most installations. Folded into a compact, lightweight package, their shipping costs are a fraction of charges for metal.

Easy replacement. Lightweight SuperSpan joints have built-in fabric flanges instead of metal flanges.

Field repairs. R/M’s experienced field crews respond quickly to problems. Minor damage can be handled by plant maintenance crews.

Noise reduction and vibration isolation. SuperSpan joints isolate vibration and prevent sound transmission between ducting sections because metal to metal contact is eliminated.

Margin of safety. SuperSpan joints accommodate errors in calculated movements and construction misalignments.

Corrosion resistant. Non-metallic SuperSpan joints resist corrosion in critical scrubber applications.

Minimum force for movement. Dimensional changes in the metal ductwork during thermal expansion and contraction are accommodated with minimum force exerted on the SuperSpan joints.

... TO OTHER NON-RIGID JOINTS:

Longer life. SuperSpan joints have tough, heavy multi-ply walled construction.

No gaskets needed. SuperSpan built-in fabric flanges act as gaskets. Usually require fewer bolts and make possible easier, less expensive installation.

High heat protection. Mark VI SuperSpan joints can handle temperatures up to 1200° F (649° C).

Corrosion resistant. The SuperSpan line includes a Teflon lined joint for critical corrosive applications.

Extra safety factor. SuperSpan large radius flanges take more movement and stress in extension.

Space age experience. R/M SuperSpan superiority is a direct result of work on aerospace materials.

All configurations. Round, square, rectangular, eccentric and reducing shapes fit all requirements for industry. Also furnished as an open end bell for field splicing.
Sizes Available
Rectangular: 1 ft x 1 ft (305mm x 305mm) to over 100 ft (30.5m) as required.
Round: 6” (152.4mm) diameter to over 100 ft (30.5m) as required.
Belt width sizes: As required.
Standard 15” (381mm), 18” (457.2mm), 22” (560mm).

Applications
The Mark VI SuperSpan Joint is excellent in power generating plants in flue gas systems from the boiler outlet to the air heater inlet having continuous temperatures up to 1200°F (649°C).
It is used on high temperature exhaust gas systems in process plants, paper mills, steel mills, foundries, cement mills, and in refinery and chemical plant and gas turbine applications.
It is used for vibration isolation of forced draft and induced draft fans. The Mark VI SuperSpan can handle large movements in axial, lateral and torsional or angular directions and needs virtually zero stress to flex, eliminating unwanted external loads on equipment.

Temperature/Pressure Parameters
R/M Mark VI SuperSpan joint can handle the following typical service conditions:
Temperature: Max +1200°F (-40°C) Min
(649°C)
Pressure: +2 psig (-13.8 kPa)
(13.8 kPa) (-2 psig)
(Vacuum)

Movements & Dimensions
The table below is a guide under which the expansion joint can safely operate.
Under some conditions the R/M Mark VI SuperSpan joint can handle movements greater than those indicated. Refer all details to R/M for recommendations. Any unusual conditions may be worked out with R/M representative. Engineering aid readily available from factory and field representatives.

Dimensions
of manufactured joints.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>15”</th>
<th>18”</th>
<th>22”</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>381</td>
<td>457.2</td>
<td>560</td>
</tr>
<tr>
<td>mm</td>
<td>381</td>
<td>457.2</td>
<td>560</td>
</tr>
</tbody>
</table>

Recommended installation in breach
flange to flange in 8 1/2” 11” 15”
in precompressed (216) (279) (381)
attitude (mm) (mm) (mm)

Axial compression
from installed 1 1/2” 2 1/2” 4”
position: Normal (38.1) (63.5) (101.6)
working range. (mm) (mm) (mm)

Axial extension: 1/4” 1” 1 1/2”
Normal working range. (12.7) (25.4) (25.4)
(mm) (mm) (mm)

Lateral offset. 3/4” 1” 1 1/2”
(mm) (mm) (mm)

Weight
Per lineal unit of joint.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>15” (381mm)</td>
<td>4.2 lbs./ft. (6.3 kg/m)</td>
</tr>
<tr>
<td>18” (457.2mm)</td>
<td>5.1 lbs./ft. (7.6 kg/m)</td>
</tr>
<tr>
<td>22” (560mm)</td>
<td>6.2 lbs./ft. (9.2 kg/m)</td>
</tr>
</tbody>
</table>

Per lineal unit of 2” x 5/8” (50.8mm x 19.05mm) back-up bars:
Approx. 5 lbs./ft. (7.44 kg/m) of periphery of expansion joint.

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Industrial Products Co.
A division of Raybestos Manhattan Inc.
North Charleston, S.C. 29406

Energy Products Group
## Typical Power Generating Station Applications

### Flue Gas System
**Hot Side**
From Economizer Outlet to Air Heater Inlet:
Mark V type joint recommended with operating temperatures up to 1000°F (538°C).

**Cool Side**
From Air Heater Outlet to Stack Inlet:
Mark III type joint recommended with operating temperatures up to 400°F (204°C) and excursion temperatures not greater than 600°F (316°C).

- or -
Modified Mark V type joint recommended with operating temperatures up to 500°F (260°C) and excursion temperatures not greater than 750°F (399°C).

### Gas Recirculating System
Mark V type joint recommended

### Combustion Air System
**Intake Air System**
Mark I or Mark II type joint recommended.

**Secondary Air System**
Mark V type joint recommended if temperatures are greater than 500°F (260°C). Modified Mark V type joint recommended if temperatures are less than 500°F (260°C).

**Primary Air System**
Mark V type joint recommended if temperatures are greater than 500°F (260°C). Modified Mark V type joint recommended if temperatures are less than 500°F (260°C).

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### Scrubber System
Mark II type joint recommended between scrubber outlet and reheater inlet when operating and excursion temperatures are below 250°F (121°C).

Mark III type joint recommended with operating temperatures up to 400°F (204°C) and excursion temperatures not greater than 600°F (316°C).

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