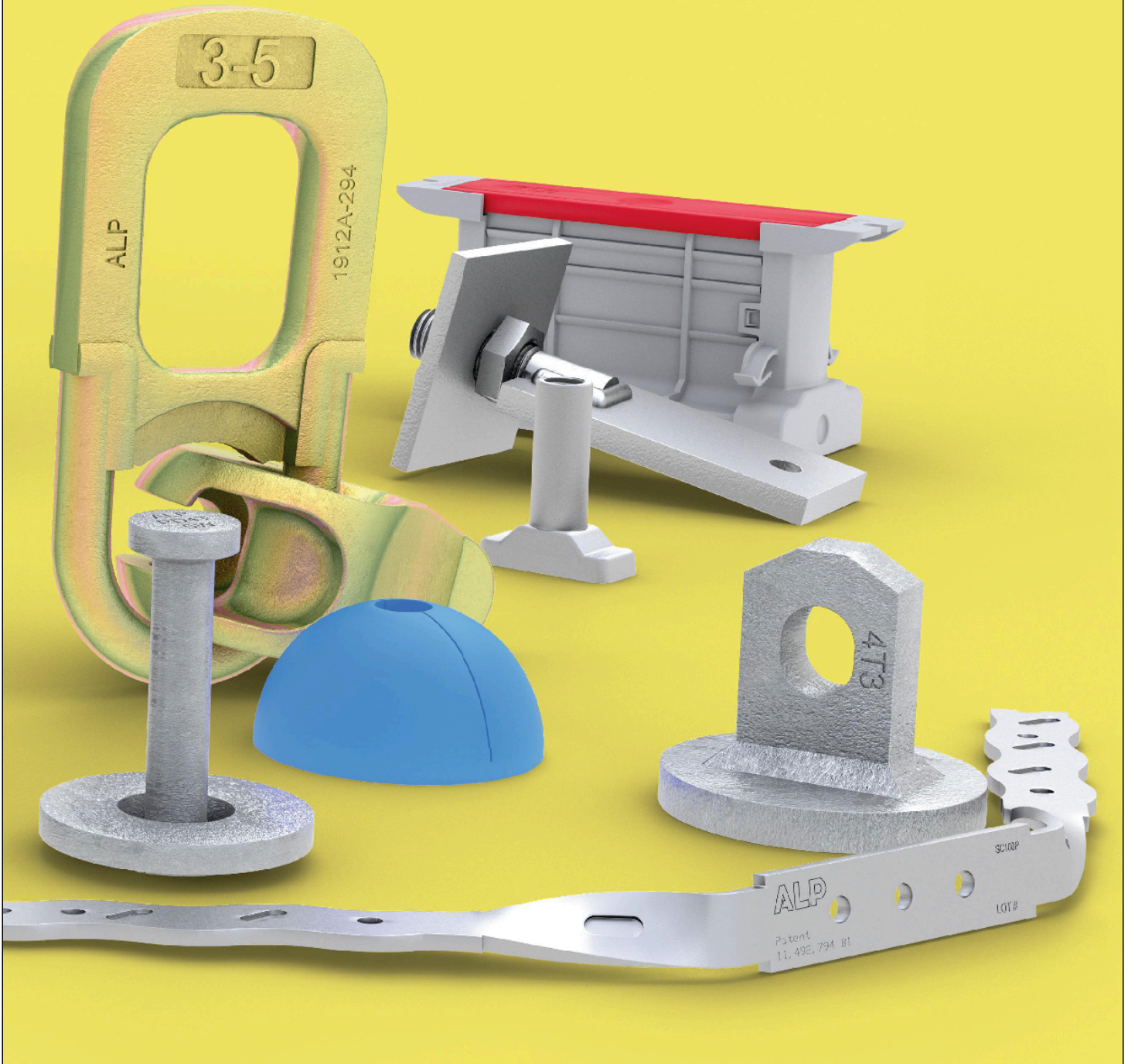


ALP SUPPLY®

2024 PRECAST ACCESSORIES TECHNICAL MANUAL & CATALOG



ALP® X-CORD® RANDOM ORIENTED FIBER PADS



X-Cord Random Oriented Fiber Pads (ROF) are preformed fabric bearing pads that are composed of cross-layered, bi-directional reinforcing fibers. This is a composite material comprised of elastomer with reinforced fibers.

The use of fibers strengthens the elastomer's stiffness to resist vertical loads while increasing capacity, but soft enough to allow for shear deformation and rotational stresses.

ALP has replaced the traditional periodic material testing methodology used for ROF bearing pads. Material specification requirements do not provide assurance that the finished product is acceptable since the testing is performed using only single layer, one directional raw materials.

In order to meet or exceed the ALP X-Cord Design Guide criteria, X-Cord bearing pads are Lot tested to provide assurance that the finished pads are fabricated using the proper cross layered material and are within the required batching heat, pressure and time ranges.

Load Requirement: the applied compressive load (V_{ap}) must be less than or equal to the max compressive load (V_{ar}) for the bearing pad to pass the vertical load requirement.

Max compressive strain, e_{max} @ 40%

Max compressive load **without** rotation, V_{nr} $V_{nr} = \frac{(0.6 \cdot SF + 2) \cdot e_{max}^{1.8} \cdot w_1 \cdot b_1}{1000}$

Loaded bearing pad length under rotation, w_2 $w_2 = \frac{e_{max} \cdot t}{100 \cdot \tan(\theta_w)} \leq w_1$

Loaded bearing pad width under rotation, b_2 $b_2 = \frac{e_{max} \cdot t}{100 \cdot \tan(\theta_b)} \leq b_1$

Compressive stress load limit, S_{limit}

Max compressive stress, S_{nr} $S_{nr} = \frac{V_{nr}}{w_2 \cdot b_2}$

The max compressive stress of any X-Cord bearing pad, regardless of size, is 8,000 psi (S_{limit}). If the calculated maximum compressive stress (S_{nr}) is greater than this limit, than the limit will be used to calculate the max compressive load (V_{ar}) instead.

ROTATION FACTOR

t - Thickness	0.125	0.25	0.375	0.5	0.625	0.75	0.875	1
k_t	4,000	2,500	1,500	500	400	325	295	275

The rotation factor (k_t) is based on the bearing pad thickness

Rotation reduction factor parallel to span, R_w $R_w = \frac{1}{k_t \cdot \theta_w^2 + 1}$

Rotation reduction factor perpendicular to span, R_b $R_b = \frac{1}{k_t \cdot \theta_b^2 + 1}$

Max Compressive Load **with** rotation, V_{ar} $V_{ar} = \min(S_{limit}, S_{nr}) \cdot w_2 \cdot b_2 \cdot R_w \cdot R_b$

SPECIFICATIONS

Material Properties	Values
Hardness (Shore A)	75 (±10)
Tensile Strength	1,000 psi

Dimensional Information	Values
Stocked Thicknesses	1/8", 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", 1"
Tolerance - Thickness	15% or ± 1/16", whichever is greater
Tolerance - Plan Dimensions	3% or ± 1/8", whichever is greater

*1/8" thickness is comprised of single-layered, uni-directional reinforcing fibers.

BEARING PADS

ALP® ISOFLEX® COTTON DUCK PADS

ALP Isoflex cotton duck pads are reinforced pads that are used when a higher compressive strength is needed. These pads are reinforced with horizontal layers of fabric, bonded in the elastomer. Designed with a high load capacity (10,000 PSI), Isoflex Pads are used to control shock and vibration and create a uniform bearing area.

Product Overview

- High load capacity with limited deflection
- Absorbs and reduces shock and vibration
- Allows for lateral movement
- Helps prevent spalling
- Conforms to AASHTO Section 18.4.10.1 Grade III
- Tested in accordance with MIL-C-882E
- Also available for slide bearing applications as Iso-Slide™



SPECIFICATIONS

Material Properties	Values	ASTM Test Method
Hardness (Shore A)	90 (± 5)	D2240
Compression - Permanent Set	13% Max at 10,000 PSI	D395
Density	67 Lb. / Cu. Ft. Min	N/A
Volume Swell (%)	25% Max	N/A
Fabric	8 oz. Polyester & Cotton Min	N/A
Delamination	None	N/A
Fungus	None	N/A

Dimensional Information	Values
Stocked Thicknesses	1/8", 1/4", 3/8", 1/2", 5/8", 3/4", 1"
Maximum Size	48" x 48"
Tolerance - Thickness	Nominal ± 5%
Tolerance - Plan Dimensions	3% or ± 1/8", whichever is greater

ALP® X-SLIDE® AND ISO-SLIDE® - SLIDE BEARING PADS

ALP X-Slide and Iso-Slide bearing pads are manufactured with a Polytetrafluoroethylene (PTFE) sheet permanently bonded to either an Isoflex™ or X-Cord™ bearing pad to create a bearing point with a low coefficient of friction, but high bearing capacity. A polished stainless steel plate is attached to the bottom of an upper bearing element to maintain the low coefficient of friction with this system.

Product Overview

- Allows for lateral movement due to thermal and unrestrained forces
- Low coefficient of friction
- Engineered for predictable performance



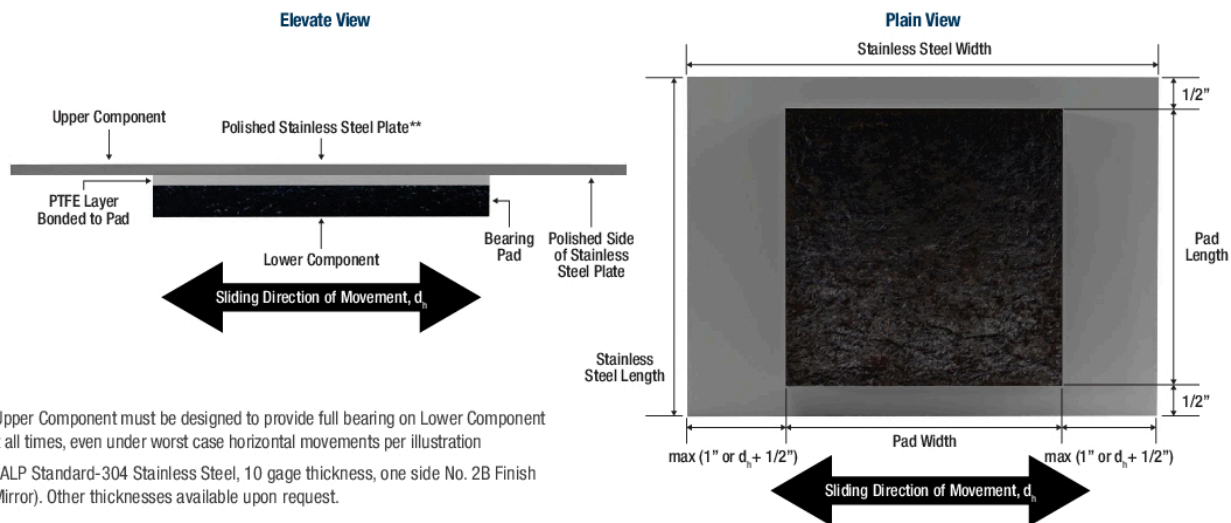
ALP PTFE PROPERTIES

Material Properties	25% Glass Filled PTFE (Type 1) "Most Popular"		Unfilled PTFE (Type 1, Grade 2)	
	Values	ASTM Test Method	Values	ASTM Test Method
Compressive Strength (Recommended)	2,500 PSI Max.	N/A	2,000 PSI Max.	N/A
Tensile Strength	2,270 PSI Min.	D4745	2,500 PSI Min.	D4894
Elongation	180% Min.	D4745	200% Min.	D4894
Specific Gravity	2.15 - 2.25	D4745	2.13 - 2.18	D4894
Coefficient of Friction*	0.12 (Typical)	D1894	.06 (Typical)	D1894

*Against a stainless steel mating surface with a 2B finish or smoother.

Dimensional Information	X-Slide Values	Iso-Slide Values
Standard Thickness*	3/32" PTFE (+ Bearing Pad)	3/32" PTFE (+ Bearing Pad)
Tolerance - Thickness	15% or ± 1/16", whichever is greater	Nominal ± 5%
Tolerance - Plan Dimensions	3% or ± 1/8", whichever is greater	3% or ± 1/8", whichever is greater

*Other thicknesses are available upon request.



*Upper Component must be designed to provide full bearing on Lower Component at all times, even under worst case horizontal movements per illustration

**ALP Standard-304 Stainless Steel, 10 gage thickness, one side No. 2B Finish (Mirror). Other thicknesses available upon request.

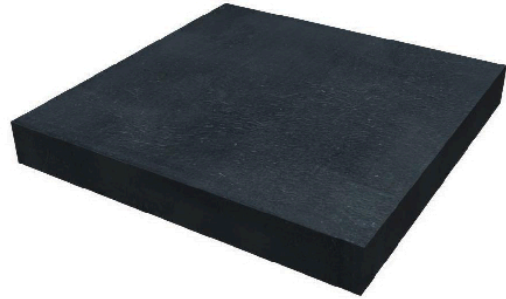
BEARING PADS

ALP® NEOPAD® 50/60/70 NEOPRENE BEARING PADS

Neopads (Neoprene Bearing Pads) are made of 100% chloroprene and are the only material that meets the requirements of AASHTO, Section 18 Standard Specifications for Highway Bridges. Neoprene Bearing Pads allow for the most freedom of movement at the bearing point, for compressive stresses lower than other pad types.

Product Overview

- Original bearing pad, typically specified by Highway DOT officials
- Available in 50, 60, or 70 durometer hardness
- Absorbs and reduces shock and vibration
- Helps prevent spalling
- Meets AASHTO Highway Specifications
- Meets A.R.E.A. Railroad Specifications



SPECIFICATIONS

Material Properties	Values			ASTM Test Method
Hardness (Shore A)	50 (± 5)	60 (± 5)	70 (± 5)	D2240
Compression Set	35% Max			D395
Tensile Strength	2,248 PSI Min			D412
Ultimate Elongation	400%	350%	300%	D412
Heat Resistance				
· Change in Hardness	15 points Max			D573
· Change in Tensile Strength	-15% Max			
· Change in Elongation	-40% Max			

Dimensional Information	Values	
	50 Durometer	60 Durometer
Stocked Thicknesses	1/2"	1/4", 1/2", 3/4", 1"
Maximum Size	48" x 48"	
Tolerance - Thickness	Nominal ± 5%	
Tolerance - Plan Dimensions	3% or ± 1/8", whichever is greater	