KAMATICS WEAR STRIP SELECTION GUIDE

Kamatics offers multiple types of Wear Strips, each providing unique characteristics to prevent metal-to-metal wear/fretting damage caused by sliding or rubbing surfaces. Kamatics Wear Strips are designed for bonding onto surfaces to act as a protective barrier. They are available in standard sizes or in custom cut profiles.

DESCRIPTION:

KAron V Wear Strip consists of standard KAron Grade V self-lubricating bearing material applied on to a thin fiberglass substrate. The KAron V bearing material provides a low sliding friction for wear resistance. KAron V Wear Strip comes with a removable woven nylon peel-ply on the back of the fiberglass to protect the bonding surface from dirt and debris.

P54 Wear Strip is a thin sheet self-lubricating bearing material comprised of a resilient thermoset resin matrix with synthetic fibers in a laminate construction for strength and durability. P54 Wear Strip comes with a removable woven nylon peel-ply on one surface to protect the bonding surface from dirt and debris.

Ultra Light Duty Wear Strip is a specially formulated low friction wear resistant material, which is a similar in construction to P54, except for its thin cross section of 0.010" (0.25mm). The upper wear resistant surface has self-lubricating properties, and the backside of the material is textured to insure maximum bond adhesion.

APPLICATION INFORMATION:

KAron V Wear Strip is designed for surfaces that are subjected to light to medium duty rubbing pressure, or as a fretting resistant barrier. The mating sliding material should be smooth, hard, and a corrosion resistant surface. For optimal KAron V liner performance, the sliding component should have a minimum surface roughness of 16 RMS (0.4 µm), and be in full contact with the KAron V Wear Strip to avoid line or point loads.

P54 Wear Strip is designed for applications where standard off-the-shelf wear resistant plastics fall short in performance. P54 Wear Strip can be used where impact resistance is required, under edge loading, in heavy abrasion applications, and where gross amounts of contaminants can be expected. P54 Wear Strip can operate against rough surfaces and against soft materials such as aluminum or composites.

Ultra Light Duty Wear Strip has a unique thin cross section, which makes it ideal for exterior aerospace surface applications that require an extremely low profile or high flexibility. The mating sliding material should be smooth, hard, and a corrosion resistant surface. For optimal Ultra Light Duty Wear Strip performance, the sliding component should have a minimum surface roughness of 16 RMS (0.4 µm), and be in full contact with the Ultra Light Duty Wear Strip to avoid line or point loads.

Kamatics Wear Strips are flexible and can conform to the contour of a mounting surface – please consult Kamatics Engineering for application design recommendations.

KAMATICS WEAR STRIP SELECTION GUIDE

PHYSICAL PROPERTIES[1]:

	KAron V Wear Strip	P54 Wear Strip	Ultra Light Duty Wear Strip
Coefficient of Friction	0.04 – 0.08	0.06 – 0.08	0.04 – 0.1
Max Static Load	30,000 psi (207 MPa)	50,000 psi (345 MPa)	20,000 psi (138 MPa)
Max Dynamic Load	10,000 psi (69 MPa)	20,000 psi (138 MPa)	10,000 psi (69 MPa)
Operating Temperature	-100°F to 250°F (-73°C to 120°C)	-65°F to 250°F (-54°C to 120°C)	-65°F to 250°F (-54°C to 120°C)

Table 1

[1] Above reported values based on wear strip only. Physical properties in service will be largely dependent upon operating conditions, the mating surface, the adhesive bond integrity, the substrate material, and surface preparation of the substrate.

FLUID COMPATIBILITY:

Kamatics Wear Strips are not affected by the following chemicals: Phosphate Ester Hydraulic Fluid (Skydrol), MIL-T-5624 Turbine Fuel Grade JP-4, MIL-PRF-7808 Lubricating Oil, MIL-PRF-5606 Hydraulic Oil, MIL-A-8243 Anti-Icing Fluid, MIL-H-83282 Hydraulic Fluid, Fresh Water, Salt Water.

ENVIRONMENTAL TESTING:

Kamatics KAron V and P54 bearing materials performed very well in independent laboratory testing. The methods used for the testing were MIL-STD-810F Environmental Engineering Considerations and Telecordia General Requirements. When subjected to tests for High and Low Temperatures, Solar Radiation, Blowing Rain, Fungus, Humidity, Salt Fog, Blowing Dust, Functional Shock, and Ozone Resistance, the Kamatics bearing material test samples showed no signs of damage or degradation.

KAMATICS WEAR STRIP SELECTION GUIDE

ORDERING INFORMATION:

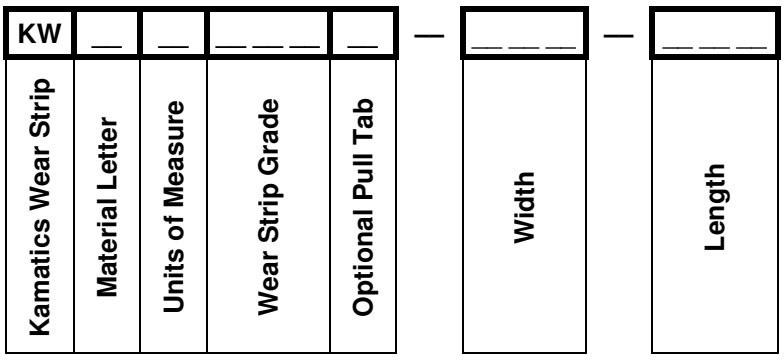
Standard Kamatics Wear Strip materials are available in flat sheets up to 12" x 48" (305 x 1219 mm). Kamatics Wear Strips are also available in cut strips as narrow as 1/2" wide up to the maximum sizes. For washers of various sizes, and custom cut shapes and profiles, contact Kamatics for ordering information. Wear Strip bearing materials are available in the following grades:

Wear Strip Type	Material Letter	Wear Strip Grade	Product Description	Nominal Thickness, inches (mm)
KAron V Wear Strip	S	100	Light Duty	0.018 (0.46)
		200	Medium Duty	0.036 (0.91)
P54 Wear Strip	P	020	Light Duty	0.020 (0.5)
		032	Medium Duty	0.032 (0.8)
		060	Heavy Duty	0.060 (1.5)
		120	Plate Stock	0.120 (3.0)
Ultra Light Duty Wear Strip	U	010	Ultra Light Duty	0.010 (0.25)

Table 2

STANDARD PART NUMBERING SYSTEM:

For standard cut strip dimension parts, Kamatics uses the following part numbering system:



Material Letter = ***S*** for KAron V Wear Strip
P for P54 Wear Strip
U for Ultra Light Duty Wear Strip

Unit of Measure = (***BLANK***) for English units
M for Metric units

Wear Strip Grade = See Table 2 above

Optional Pull Tab = (***BLANK***) for no Pull Tab
T for optional Pull Tab – KAron V Wear Strip ONLY – 3/8" Pull Tab for easy removal of peel-ply backing

Width = English units: width in 1/8" increments up to 12", example 024 = 3" wide
Metric units: width in 5mm increments up to 300mm, example 020 = 100mm wide

Length = English units: length in 1/4" increments up to 48", example 096 = 24" long
Metric units: length in 10mm increments up to 1200mm, example 050 = 500mm long

Part Number Examples:
KWS100T-016-192 = KAron V Light Duty Wear Strip, 2" x 48", with pull tab
KWSM200-007-095 = KAron V Medium Duty Wear Strip, 35mm x 950mm, no pull tab
KWP060-096-192 = P54 Heavy Duty Wear Strip, 12" x 48"
KWU010-048-096 = Ultra Light Duty Wear Strip, 6" x 24"

KAMATICS WEAR STRIP SELECTION GUIDE

BONDING PROCEDURE:

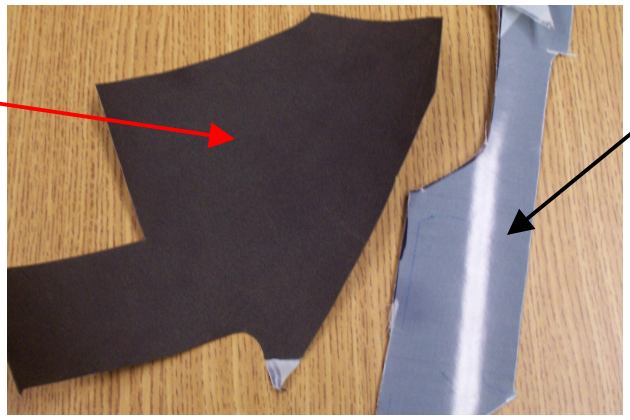
KAron V Wear Strip comes with a removable woven nylon peel-ply on the back of the fiberglass to protect the bonding surface from dirt and debris. When the pull tab (T) option is called out in the part number, a 3/8" (9.5mm) long breakaway tab will be provided for easy removal of the peel ply backing. With the peel-ply removed and the back surface exposed, the KAron V Wear Strip is prepared and ready for bonding on to a suitable surface.

P54 Wear Strip comes with a removable woven nylon peel-ply on one surface to protect the bonding surface from dirt and debris. With the peel-ply removed and the back surface exposed, the P54 Wear Strip is prepared and ready for bonding on to a suitable surface.

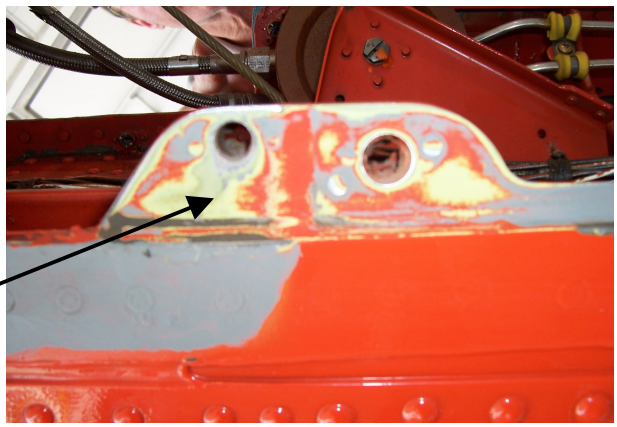
Ultra Light Duty Wear Strip is intentionally textured on the backside to insure maximum adhesion. The textured surface can always be identified by its light brown/gray color versus the dark brown/black color of the smooth running surface. Careful preparation of the textured Ultra Light Duty Wear Strip bonding surface is imperative to ensure a proper bond, and it should be cleaned with an appropriate solvent (e.g. isopropyl alcohol) immediately prior to bonding.

Standard room-temperature curing structural epoxy adhesives are recommended for bonding Kamatics Wear Strip material, such as Hysol EA9309 (Henkel Loctite Aerospace), Hysol EA9396 (Henkel Loctite Aerospace), Hysol EA9460 (Henkel Loctite Industrial), Scotchweld 460 (3M Co.), and Araldite 2011 (Huntsman). Follow the manufacturer's suggested procedures for maximum adhesion to the mating surface. The mating adherent surface should have or be roughened to a finish of greater than 63 RMS (1.6 µm), and be cleaned with an appropriate solvent (e.g. isopropyl alcohol) immediately prior to bonding.

Anti-fretting coating
The “active” part of the wear strip, this is the protective barrier inserted between two contact surfaces.



Woven nylon peel-ply
This removable layer (gray in color) protects the bonding side of the Wear Strip until substrate surface prep is complete and ready for bonding agent.



Surface Preparation
Roughened and cleaned area, ready for bonding of KAMATICS Wear Strip.

KAMATICS WEAR STRIP SELECTION GUIDE

WEAR STRIP PRODUCTS WITH "SELF-STICK" ADHESIVE:

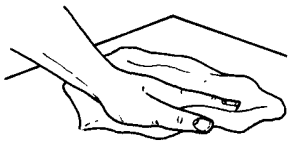
Kamatics manufactures several wear strip products with an integral acrylic pressure sensitive "self-stick" adhesive for ease of assembly. This form of adhesive is suitable for non-contaminated applications below 150°F (66°C). Kamatics wear strips with self-stick adhesive are custom products – contact Kamatics for product availability.

SELF-STICK BONDING PROCEDURE:

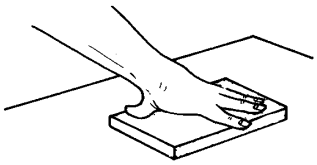
The following instructions are recommended for optimum self-stick adhesive strength.

Surface preparation

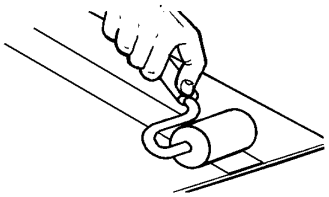
The self-stick adhesive will adhere well to most clean, dry surfaces. Typical surface cleaning solvents are a 50/50 isopropyl alcohol (rubbing alcohol)/water mixture. Scrubbing the surfaces with a solvent saturated mild abrasive pad and then wiping the surface with a clean cloth to remove the solvent and contaminants provides good results. Follow solvent manufacturer's precautionary warnings and suggested handling procedures when using solvents.



Step 1: Solvent wipe



Step 2: Clean dry



Step 3: Apply adhesive with pressure

Bonding Pressure

Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact and thus improves bond strength. The most common technique is to apply the exposed self-stick adhesive backing onto the cleaned surface, then apply very firm pressure to the entire bond line. This can be accomplished by rolling a soft hand-held plastic roller against the wear strip surface, or by clamping a solid face sheet against the wear strip surface.

Application Temperature

Ideal adhesive application temperature range is 70°F to 100°F (21°C to 38°C). Initial application to surfaces at temperatures below 50°F (10°C) is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory.

Dwell Time

After application, the bond strength increases and approaches the ultimate bond strength after 72 hours at 70°F (21°C). In some cases bond strength can be increased and ultimate bond strength can be achieved more quickly by exposure of the bond to elevated temperatures; i.e. 150° F (66° C) for 1 hour. This provides quicker and more thorough adhesive wet out onto the substrate.