

Flexible connectors are used to isolate vibration and noise from the ductwork. The source of these vibrations and noises are usually fans used for air conditioning and heating units. One method to isolate the vibration is to install flexible connections. These connectors have a fabric attached to metal on each side which connects to the ductwork and the source of the vibration. The fabric isolates the vibration from the ductwork. Ductmate has developed the PROflex flexible connectors which are available in various fabrics such as; vinyl super duty, neoprene, hypalon, silicone and teflon. Each of the fabrics are used for different application requirements.

Fabric	Type of Fabric	Weight	Tongue Tear	Tensile Strength	Temperature
Vinyl Super Duty	Woven nylon	22oz. sq./yd.	150/150lbs.	500/400lbs.	-40°F/180°F
Neoprene	Woven fiberglass	30oz./sq.yd.	25/20lbs.	500/500lbs.	-40°F/200°F
Hypalon	Woven fiberglass	24oz./sq.yd.	20/15lbs.	500/500lbs.	-50°F/250°F
Silicon	Satin weave fiberglass	17.5oz./sq.yd.	50/40lbs.	200/150lbs.	-67°F/250°F
Teflon	Woven fiberglass	18oz./sq.yd.	60/40lbs.	400/300lbs.	-67°F/500°F

The fabrics were developed to meet the different applications that are presently used when installing ductwork. Each fabric is developed with certain criteria in order to perform for each application. None of the PROflex fabrics are affected by mildew. The vinyl super duty is the strongest all-purpose fabric in the industry. It has excellent resistance to cuts, tears and abrasions. Neoprene is ideal for kitchen exhaust and fume hoods. Hypalon's UV resistant characteristics makes it ideal for outdoor applications. For high temperature applications, silicone would be the fabric of choice. Finally, teflon provides excellent flexibility in extreme temperatures. Teflon also has the highest chemical resistance

Advanced roll forming machines are used during the manufacturing process to permanently secure the fabric to the metal. Two types of metal to fabrics attachments are available; single fold and double fold. The single fold is when the metal is folded over the fabric once and the double fold is when the metal is folded over the fabric twice. Both connections have been tested to 10" w.g. The double fold is recommended for increased strength in applications over 10" w.g.

The flexible connector can be used on rectangular and round ducts. The method of constructing the flexible connector is shown in SMACNA Duct Construction Standards, page 2.21, figure 2.17. The flexible connector is connected to the ductwork by various methods. The most common method is to attach a Ductmate flange or formed on flange such as TDC/TDF onto the steel edge of the flexible connector.

Weight of Fabrics

Many people are unaware of the actual role that weight plays in a finished product. The strength and durability have little affect on the relevance to weight. The fabric is only a small portion of its overall weight. The reinforcing fabric provides the tear, tensile and stitch tear strength. The mass of what the product is made of is the material which covers the base fabric. The important aspects are the quality of the material and the top/bottom (weather side/lining side) thickness distribution. The material is calibrated on machines to measure thickness and performance standards, not weight requirements. The thickness tolerances are very minute. Flame retardants, fungicides, polyvinylchloride resin, plasticizers, pigments and various other chemicals work in conjunction to produce the industries' best fabrics. Therefore, you are looking in the wrong direction when trying to use weight as a valuable source for a reason to specify a certain fabric. The reinforcement fabric, which provides the main strength of a flexible duct connector, contributes virtually nothing when dealing with a materials weight. In other words, you would be better off selecting your material by the material performance and reputation of the supplier rather than the weight or perception of the material.

Tongue Tear

A rectangular piece of fabric is cut to form a tongue, (this is where the test derives its name). There must be a tear in the fabric prior to the testing (re-testing machine). The test results in two calculations which are the single-peak force and the average of the five highest peak forces. Peak force is defined as the maximum force required to break one or more yarns in a fabric or break the fiber, fiber bonds, or fiber interlocks in other manufactured fabric forms. The tearing force is the force required to propagate a tear under specified conditions. The capacity of a fabric to withstand the tearing force required to propagate a tear after its initiation is called its' tearing strength.

Tensile Strength

Unlike the tongue tear test, the tensile strength test does not require the fabric to be torn prior to testing. The purpose of this test is to determine the assistance strength of the fabric, or the strength of the yarns in a specific width together with the fabric, assistance from the adjacent yarns. The test is performed on a specimen, which measures four inches in length. The specimen is then placed into the upper and lower clamps of a tensile testing machine. A force is then applied until the fabric is broken. There are two types of tests ran. These tests include: the grab test and the modified grab test. The purpose of the grab test is to determine the effective strength of the fabric, or the strength of the yarns in a specific width together with the fabric, assistance from the adjacent yarns. The modified grab test procedure is used to determine the breaking force for fabrics with constructions in which the application of tensile stress on ravel strip specimens produces further unraveling.

Temperature

Each fabric is capable of performing within certain temperature ranges. In every case, the fabrics can be utilized efficiently at the high/low temperature range that is listed in the chart above. As you can see, some fabrics, such as Teflon, are made to perform at a wide range of temperatures. This would make them an excellent choice for outdoor applications. Others, however, specialize in simply high temperature applications, for instance neoprene, hypalon and silicone. Ductmate has provided a variety of specialized fabrics for your flexible duct connector applications.

The challenge of engineering a leak-free flexible duct connector system has been met by Ductmate's PROflex. In order to verify the capability of the connectors at different static pressures, Ductmate performed a leakage test. In every case the flexible connectors showed minimal leakage for static pressures up to 15" w.g.

All fabrics except Teflon have been tested for fire according to Underwriters Laboratory #214 test. The requirements apply to the performance of the fabric when exposed to an open flame. The flame resistance of the fabric may be inherent in the material used or may be the result of chemical treatment.

Ductmate has developed flexible round and rectangular duct connectors which are a dependable source for a leak-free connection, isolation of vibration, and reduction. For additional information, or a list of all our fabrics and their specifications, call 800/245/3188.