

SUPERIOR PHYSICAL PROPERTIES

Polyurethane has superior physical properties, making it the ideal jacket for cables in motion control applications subjected to continuous flexing. Choosing PUR can make a huge difference in critical applications for industrial equipment offering longer equipment lifetime and better return of investment

POLYURETHANE IN INDUSTRIAL CABLES

Polyurethane or short “PUR” is used in many applications ranging from industrial, foot- and sportswear, furniture, automotive applications and many more. PUR is a thermoplastic material offering multiple benefits, but the main reasons for its use in industrial cables are:

- Ruggedness
- High cut-through resistance
- High abrasion resistance
- Good oil and chemical resistance
- Excellent weathering and ageing properties
- Good temperature range
- Halogen free

These superior physical properties make it an excellent choice for many specialty industrial cabling applications. In this paper we will break down how these advantages benefit customers with challenging industrial applications:

Ruggedness, high cut-through, and abrasion resistance are useful properties for applications where the cable is subjected to any mechanical stress, such as linear flexing, torsion or reeling applications on industrial machinery and equipment. The jacket is tough enough to protect the cable from these motions and the abrasion caused by rubbing against other components. PUR is also difficult to kink and retains good memory of its shape, making it ideal for flexing, retractable and spiral cables.

Its good **resistance to oil, chemicals, weathering, and ageing** make PUR a good material choice for many challenging industrial indoor and outdoor applications such as machine tools, cranes, hoists, mining equipment, aerial platforms and even wind and power turbines. The **temperature range**, depending on the grade, can range from **-50 °C to +125 °C**, making it ideal for applications with a broad range of ambient temperatures.

Most grades of PUR are inherently **halogen free**; some halogenated options exist to improve the flammability, sometimes at the cost of some other physical attributes. The advantage of using halogen free material is that it does not emit dangerous levels of toxic or corrosive gases in the event of fire, protecting life and electronic equipment. This makes the material very



TKFF390 for continuous flexing



Connectorized servo motor cables

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useful for applications in transportation, public spaces or in any area where corrosive gases must not destroy critical electronic equipment in the event of fire.

There are different ratings for flammability of cable. One important flame test rating is the CSA Flame Test (rated FT1, FT2, FT4 and FT6) which is also harmonized with UL standards. While “halogen free” is typically considered an advantage, the absence of halogens contributes to a lower rating in the flame test results. An FT4 rated cable for example, would have less flame propagation than a FT1 rated cable. Ironically, it is the absence of toxic gases in halogen free cables causing this conundrum. To prevent a cable from its flame propagating, it often uses halogens. For example, regular PVC has inherent halogens and releases toxic halogen gases in the event of fire. The presence of the halogen gases removes the oxygen from the flame and the fire goes out. This is not a feature of halogen free PUR cables and therefore these cables are not being used in applications requiring this behavior. Most halogen free **PUR cables are rated FT1**, and their **advantages lie in the mechanical features** PUR offers and in the fact that halogens are **not** being released in the event of fire. Applications are plentiful, ranging from public transportation, wind power, to industrial machinery per NFPA 79.

CONCLUSION

TecniKabel makes cable with polyurethane jackets for a broad range of industrial applications and cables in motion. However, we are most proud of being a pioneer in offering high flexing servo cables for the USA market utilizing a 90 °C temperature rating per UL. With this approval a better ampacity rating may be available per NFPA table 12.5.1, compared to cables using the typical 80 °C approval. We believe that this is a game changer for the servo industry, leading to more use of PUR in challenging applications, including servo cable applications subjected to continuous flexing.

All cables in our popular TKFF390 range are halogen free and utilize this new approval. These cables also meet the high demands on special cables in the NFPA 79 standard for industrial machinery.

Please contact us to see if our polyurethane solution is right for your application.