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**Comparison of 2-ply high strength cord
and 4-ply standard cord**

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General Discussion

The extended pressure range air spring bellow can be made of two materials: 2-ply high strength cord (HSC) or 4-ply standard cord. A majority of these bellows are now made with 2-ply HSC due to the advantages of strength and durability. The 4-ply standard cord still has advantages and is used in some applications.

Burst Pressure and Tensile Strength Comparison

HSC can withstand the same, if not more, pressure as the standard cord with half of the number of plies. The following table compares the burst pressures of similar air springs with 2-ply HSC and 4-ply standard cord.

2-Ply High Strength Cord Part Type / Burst Pressure	4-Ply Standard Cord Part Type / Burst Pressure
117B / 52.1 BAR	117B / 52.1 BAR
210C / 37.9 BAR	229C / 38.9 BAR
1T14F-8 / 37.2 BAR	1T28F-8 / 25.6 BAR
1T14F-11 / 28.6 BAR	1T28F-11 / 25.4 BAR

HSC cord is able to handle these pressures with only two plies because of the high tensile strength of the cord relative to the standard cord. The tensile strength of the HSC is more than double that of the standard cord.

Durability

Another advantage of the HSC is the improved durability over the standard cord. Since HSC is able to use only 2-ply, less friction is caused over long periods of dynamic use. The area in which blistering may occur is 1/3 that of the 4-ply. This lower amount of friction decreases the temperature within the air spring resulting in a longer life. Dynamic applications should give special attention to this advantage.

4-Ply Applications

4-ply is still available and used in certain applications. 4-ply provides greater lateral stiffness due to the additional thickness of the walls of the bellows. This lateral stiffness provides stability in off-balanced loads.

Conclusions

The HSC provides the same, if not better, characteristics as the standard cord. Strength and durability are advantages which lead to the wide use of the 2-ply material. In some applications requiring increased lateral stability, the 4-ply is still used. Overall, the 2-ply high strength cord has led to an improved product.