

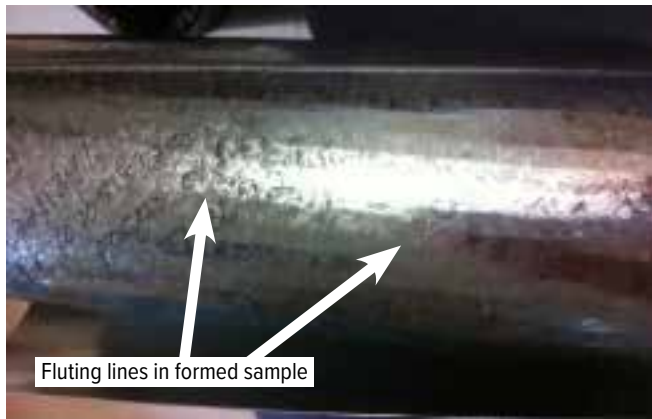
Introduction:

Due to the chemical and physical variability within certain paint systems and slight process equipment changes from one production run to another, there are some products whose appearance may not be the same from order to order. This technical bulletin describes those items Steelscape does not guarantee as reproducible and guidelines for avoiding mixed orders on jobsites.

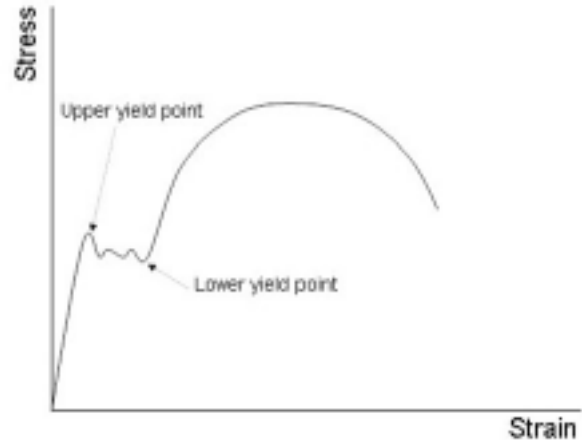
Definition:

Fluting can be defined as follows:

Visible line markings that run perpendicular to the forming direction and sometimes appear on the surface of flat rolled low carbon steel products during forming of cylindrical parts.



Fluting is a naturally occurring characteristic of annealed low-carbon steel and is influenced by the steel chemistry, cold-reduction practices and annealing cycles. It is associated with material that has an upper and lower yield point, or yield point elongation (YPE) and may also be referred to as Luder Lines, stretcher strain, or discontinuous/non-uniform yielding.



Product that does not exhibit these lines when formed is usually called non-fluting and is likely related to tension-leveling and/or temper passing practices after annealing.

Controlling Fluting During Coil Production:

Fluting can be eliminated or minimized depending on steel chemistry and processing equipment capability. Production lines with high load temper rolling or stretcher/tension leveling capabilities can produce a non-fluting material. However, the elimination of fluting is often only temporary, and will re-appear as the steel ages.

Steelscape has the ability to skin pass product on both the TruZinc® and ZINCALUME® lines. If the skin pass mill is used the resulting product will be non-fluting for a period of time. All paint line feed coils are skin passed for surface smoothness, but the paint line process accelerates the aging of the steel and therefore fluting may return. For this reason, Steelscape CANNOT guarantee non-fluting on painted product. The only remedy available at Steelscape is to tension level the painted product after painting. However, like using the skin pass mill, the non-fluting characteristic is temporary.

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How to Order Fluting/Non-Fluting Product:

While skin passing of non-painted, bare material is not standard, it can be requested if non-fluting is required. There are several end uses that automatically trigger this process. It is important when non-fluting material is required for bare product that it be included on the purchase order and, where applicable, one of the end uses below be designated:

- HVAC
- Cornerbead—Bullnose
- Cornerbead
- Piping-Spiral
- Piping-Chimney
- Piping-Furnace
- Track-Garage Door
- Flashing-Bird stop (curved)
- Rainwater Goods
- Ductwork-Die stamped

As already mentioned, Steelscape cannot guarantee non-fluting on painted product without the additional tension leveling or extension process, which is only offered on the slitter at the Rancho Cucamonga, CA location. If painted, non-fluting material is required, the requirement **MUST** be included on the purchase order and reviewed with both the Steelscape Sales Representative and Technical Department. Additional processing charges may be incurred.

Bare product ordered as non-fluting or painted product subsequently tension leveled for non-fluting should be formed into final parts within 90 days of receipt.

The information and advice contained in this Technical Bulletin ("Bulletin") is of a general nature only and has not been prepared with your specific needs in mind. You should always obtain specialist advice to ensure that the materials, approach and techniques referred to in this Bulletin meet your specific requirements.

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