

Breaking Strength

The breaking strength of any Camesa cable can be found on both the Cable Specification Sheet and in the catalog. These can either be found on the website www.camesa.com or call your Camesa representative to send you physical copies. These values of breaking strength are theoretical values assuming the cable is in new physical condition, and the cable is pulled straight without rotating. Camesa cables are regularly tested to verify that the breaking strength exceeds the catalog values.

There are many factors which can affect the breaking strength of a cable after it has been in the field which include:

- Physical wear on the cable which reduces the diameter of the outer armor wires; hence, reducing the breaking strength of the cable.
- Corrosion of the cable will reduce the effective diameter of both the inner and outer armor wires and again reduce the breaking strength.
- H₂S exposure can embrittle the steel and drastically reduce its breaking strength as it bends over the sheave wheel.
- CO₂ exposure will also cause accelerated corrosion.
- Excessive rotation of the cable, caused by improper operating tensions or hydraulic packers can reduce the breaking strength by as much as 30%.
- Splices, if done properly, can withstand loads over 90% of the cable's breaking strength. However they lose much of their strength if put into compression (spudding), and tend to deteriorate quickly when run over sheaves frequently. Shims used in splicing need to be inspected regularly for wear.
- Fatigue of armor wires occurs when the cable is "yo-yoed" at high tension. When it is necessary to "yo-yo" a cable, then at every 10 or 20 cycles the upper sheave wheel or truck should be moved so that a fresh section of cable is passing under the measuring head and over the sheave wheels.
- Physical damage such as kinks, armor scratches, dents, etc. to the cable can result in a much reduced breaking strength.

Operating strength of a cable is expressed as the percent of ends fixed breaking strength (BS) of the cable. For GIPS and sour service cables Camesa recommends an operating strength of 50% of the breaking strength.

The cable will operate an unlimited number of tension cycles to its operating strength without permanent damage to the cable. When the cable is stressed to above the operating strength, there may be permanent irreversible damage. Above the recommended operating strength there can be plastic forced out of the gaps in the inner armor resulting in less electrical insulation between the conductor and armor. There may also be additional elongation of the cable and when tension is released "Z" kinks may begin to form in the copper conductor. If these high tensions are repeated it will lead to electrical failure.