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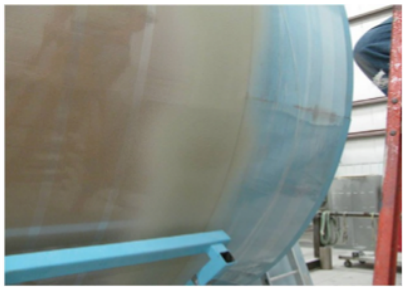
ACTS CerarMix™ Solutions International



Introducing CerarMix™

to the Oil & Gas world.....

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1224 Pecan Avenue Philadelphia, MS 39350
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"One of the most effective ways for the world to conserve its scarce natural monetary resources is to make things last longer." - Matt Merchant

CerarMix

Cerarmix is a product that has been around for a number of years but is only now being released onto the commercial market. It was originally developed at the request of the US Department of Defense who required a lightweight, structurally sound product that would withstand battlefield conditions. CerarMix has been used extensively within submarines, helicopters, armored personnel carriers, etc. and has been independently tested by a number of engineering laboratories and in-field environments with outstanding results in some of the harshest conditions in the world.

Not only does CerarMix afford structural strength, thereby increasing the overall integrity of any existing structure when coated, it also has many other high performance attributes. These include significant insulation values, ballistic values, fire retardant values, anticorrosive properties, hardness qualities etc. while being rated as an environmentally clean green product.

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Oil & Gas

The use of CerarMix in the oil and gas industry has evolved as a result of ACTS CSI investigating and testing many different products to combat the problems that almost all oil and gas wells encounter globally. Traditionally, down hole well tubing is either produced from mild steel or in some cases fiberglass. Both forms of tubing have inherent issues associated with their use. As with most corrosive wells these forms of tubing have an extremely limited life span; in some cases as short as one to six months.

Oil and Gas Tubing Issues

The next few pages will cover some of the more common issues encountered within the oil and gas industry and information on how CerarMix is an answer to these issues.

ELECTROLYSIS

This is one of the main issues facing well owners in terms of reducing the usable life of steel well tubing. This is especially true for well owners who are producing from multiple geologic zones where the waters from each zone co-mingle causing the process of electrolysis. This process accelerates wormholes, wall thinning and other degradation that eats away at the steel walls of well tubing. CerarMix Tubing, (100% manufactured or coated) is not affected by electrolysis in any way. For well operators using CerarMix; electrolysis is no longer an issue.

SOLIDS BUILD-UP

Solids build-up (Paraffin, Jip etc.) Many wells currently in operation have major issues with solids forming in and around the tubing. The solids build up over a relatively short period of time and begin attaching to the steel. When the tubing has to be removed, either for regular pump maintenance, tubing leaks or because of a solids induced stack-out, the buildup can make it extremely difficult, or in some cases impossible, to extract without breaking or stretching the tubing to a point where it can no longer be used. Additionally, some chemicals injected into the well to combat the different solids are highly corrosive and can eat through standard tubing within short time frames. CerarMix tubing is 100% hydroscopic, meaning that nothing will adhere to it and solids buildup is never an is- sue. CerarMix has also been tested in extremely corrosive conditions and withstood the test of any chemicals that have been applied to it.

TEMPERATURE

As CerarMix does not allow or sup- port thermal transference the temperature of both water and gas within the well as it travels to the surface is little changed. Test results from a 22,000 foot well indicated a change in temperature of less than 4 degrees. Additionally, as there is no thermal transfer either internally or externally with CerarMix pipe, extreme temperature changes on products such as oil, where the increase of viscosity at cold temperatures slows its rate of travel through and along a pipeline system, is no longer an issue when CerarMix pipe is used. Any product travelling through a CerarMix pipeline remains at a relatively constant temperature unaffected by external conditions.

CHEMICALS

Different well owners use different chemicals for well maintenance, fracking, well cleaning etc. The majority of these chemicals are not overly corrosive, however, some specific chemicals used down-hole are extremely corrosive. None of these chemicals will in any way affect CerarMix be-cause of the impervious properties of the product. Extensive ASTM testing is available to support this claim.

TOOLING

In the past, there have been other forms of oil/gas tubing introduced onto the market manufactured out of a variety of materials, however, one of the many reasons that these products have not succeeded has been that well operators had to change their existing tooling on their work- over rigs, e.g., power tongs, spiders, elevators, etc., to conform with these new products

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CerarMix has been designed and is manufactured to the same tooling specifications as existing steel tubing and as such, no specialized tooling is required for CerarMix.

WEIGHT

Weight of tubing is a major issue especially in the deeper wells (16,000ft+) where the entire weight of the steel tubing is hanging off the top thread of each length. For some, matters become further complicated when additional weight is added from the buildup of paraffin, jip and other solids that attaches and forms along the tubing walls. Often the weight will cause a socket to give way by stripping out the threads that are holding it. As CerarMix tubing is significantly stronger with a higher tensile strength than traditional steel, coupled with the fact that CerarMix is only 42% of the comparable weight of steel, traditional problems encountered with steel tubing are no longer an issue. Moreover, since CerarMix is hydroscopic, weight added by solids buildup will be eliminated because they are un- able to adhere to it.

STRENGTH

The overall strength is one of the first questions asked about CerarMix. Traditional steel tubing often stretches or de- laminates especially when lifting deeper wells or wells that have a horizontal portion to them. Work-over rigs have been known to stretch steel tubing to a point where it either breaks or the internal diameter of the tubing becomes so narrow that the pump rods will no longer fit inside. CerarMix tubing will not delaminate within itself or from any substrate onto which it is applied. The co-efficiencies of expansion for CerarMix tubing are determined prior to its manufacture.

When CerarMix is applied to an existing substrate, (e.g. steel, plastic) and a predetermined amount of elasticity, equal to that of the substrate, is required this is achieved at the point of formulation. CerarMix provides co-efficiencies of expansion, equal to the substrate as has been extensively documented in an independent ASTM testing.

WELL BREAKAGES

Many producing wells have been prematurely shut-in as a result of broken tubing down-hole that has either been split, shot off or in some way difficult for the operator to extract. Extraction is normally done by either inserting a plug into the top of the remaining tubing and expanding that plug inside so that it grabs onto the tubing or by attaching a clamp on the externals of the remaining tubing and extracting it. There are a few dynamics at play here. First is the weight, CerarMix weights considerably less than steel tubing (42% of steel). Secondly, the threads will not strip or stretch on CerarMix due to the increased strength of the product. Thirdly with molded square heads or "grabbing" indentations on the CerarMix pipe, (which traditional steel tubing does not have) there is an additional grabbing point on the tubing itself.

FLEXIBILITY

Flexibility is becoming an ever-increasing issue with well tubing especially as more horizontal wells are being drilled. Traditional steel tubing can bend at a maximum, for most sizes, at 10 degrees per 100 vertical feet of well. CerarMix tubing, on the other hand, can withstand a greater bend than steel without any weakening or delaminating with an average bend, for most sizes, being 15 degrees per 80 vertical feet of well.

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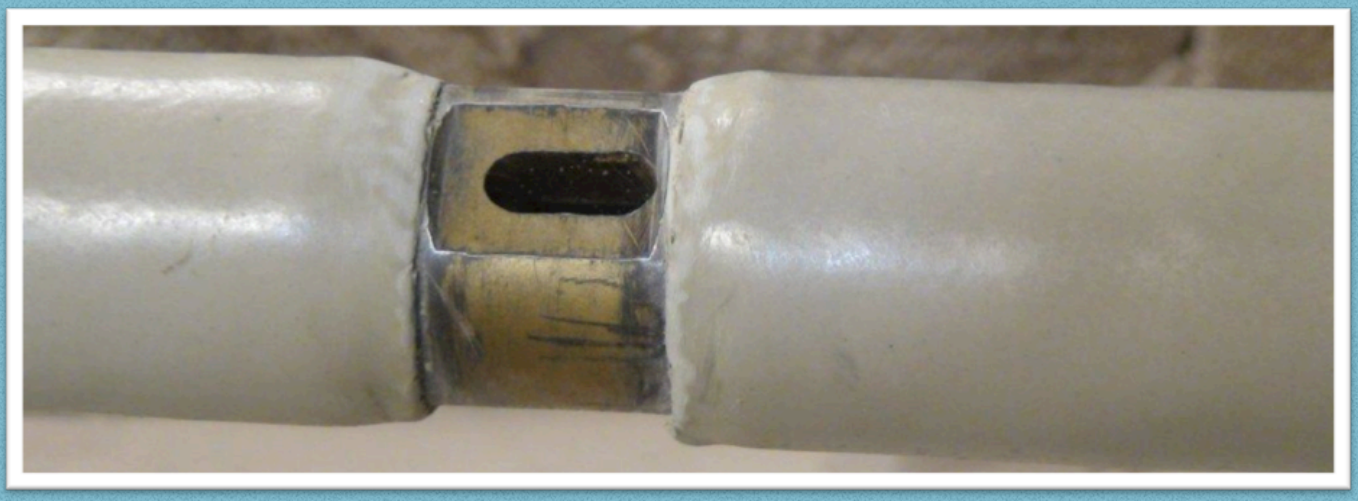
Specifications and performance criteria of CerarMix is as follows:

- Corrosion resistance equal or better than vinyl ester resin products
- CerarMix coating once applied will not delaminate
- Better abrasion resistance than 2205 duplex stainless steel and carbide/resin materials.
- Non "hazardous substance" or "hazardous material" under applicable laws
- Reflects 98% incident heat
- Exposure to natural ultraviolet light will not affect material performance or appearance
- Does not contain silica
- Hardness- Barcol: 80 / MOH: 9F (similar hardness as diamonds)
- Compressive Strength- ASTM D-759: 16,000 psi
- Tensile Strength- ASTM D-307: 9,500 psi
- Flexural Strength- ASTM D-790: 21,300 psi
- Bond Strength- 1000 / 1200 PSI. CerarMix does not delaminate. (Concrete:›400 psi/ steel: 1,200 psi)
- Is 100% non-permeable. Zero water, steam, sound etc. will travel through CerarMix
- Modulus of Elasticity- ASTM D-790: 0.9×10^{6}
- Coefficient of Thermal Expansion- 6.5×10^{66}
- Indentation- MIL-D-3143F None
- Heat Resistance- 400°F Continuous, 600°F Transient
- Flammability- UAB-DTRC-MIL-STD: 2031 Self Extinguishing after 30 min. exposure (800°F)
- Water Solubility- 0.0095
- Abrasion Resistance- Taber Testing per ASTM D – 4060 CS-17 Wheel: 0.020 gm



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