

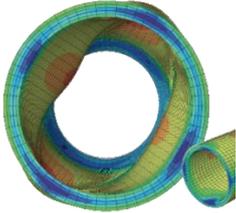
Case Study – VERTECHS WIZARD® Slim



High pass-thru ability, fully dissolvable, eliminates milling, reduce overall operation hours and costs

June, 2018, a major operator in Middle East requested Vertechs to provide solutions after a multistage frac operation has been suspended due to downhole restriction. Vertechs provided the operator with WIZARD Slim dissolvable plug for better passing-through ability, while maintaining high differential pressure holding ability, and leaving no debris downhole once the plug dissolves.

Customer Challenges VS Vertechs Solutions

	Customer Challenges	Vertechs Solutions
1	<p>Downhole Restriction:</p> <p>Casing deformed from 4.5" ID to 4.15" ID</p> 	<p>WIZARD Slim Dissolvable Plug</p> <p>OD: 3.85"</p> <p>9,000 psi rated</p> 
2	<p>Extended RIH time by eCoil</p> <p>Ecoil RIH - 6 hours</p> <p>Trip in & out - 12 hours</p>	<ul style="list-style-type: none"> • Experience with RIH dissolvable plugs by coil tubing; • Sound knowledge on dissolvable technology; • Strict QAQC to ensure every plug's quality; • Onsite dissolving time-delay technic; • Onsite engineer support; • Complete operation heads-up to extend dissolvable plug pressure holding time.
3	<p>Extended Frac Duration</p> <p>18 hours of frac duration with more than 64,000bbls frac volume per stage.</p>	
4	<p>High Pressure Cycles</p> <p>Diversion technic will be applied several times during the frac to open new perfs, the plug will be exposed to high pressure cycles.</p>	
5	<p>Dissolving Concerns</p> <p>Customer had bad experience with dissolvable tool in the past, where the tool did not dissolve in flowback/produced fluids.</p>	
6	<p>Emergency Delivery Lead</p> <p>11 days from call-off to equipment & field engineer deployment.</p>	<p>Pre-Job Dissolving Test in Produced Fluids</p> <ul style="list-style-type: none"> • Dissolving test in produced fluids was conducted to prove and ensure that the plug will dissolve in produced fluid less than 7 days. • Vertechs emergency inventories. • Exceptional global logistic experience.

Results:

1. Vertechs delivered tools & engineers to Middle East within **11 days** operation lead .
2. Plugs held **57 hours** without failing
3. Plugs held maximum differential pressure rating around **9,000 psi**.
4. Plugs has **dissolved** in produced fluid.