

ANTON 安東

A horizontal banner with a dark blue background. On the left side, there is a solid red vertical rectangle. The background of the banner features a faint, stylized image of an oil drilling rig in a desert landscape with mountains in the distance. The text 'Anton Fracturing Technology' is centered in white.

Anton Fracturing Technology

东方智慧 全球分享
Oriental wisdom , Global sharing

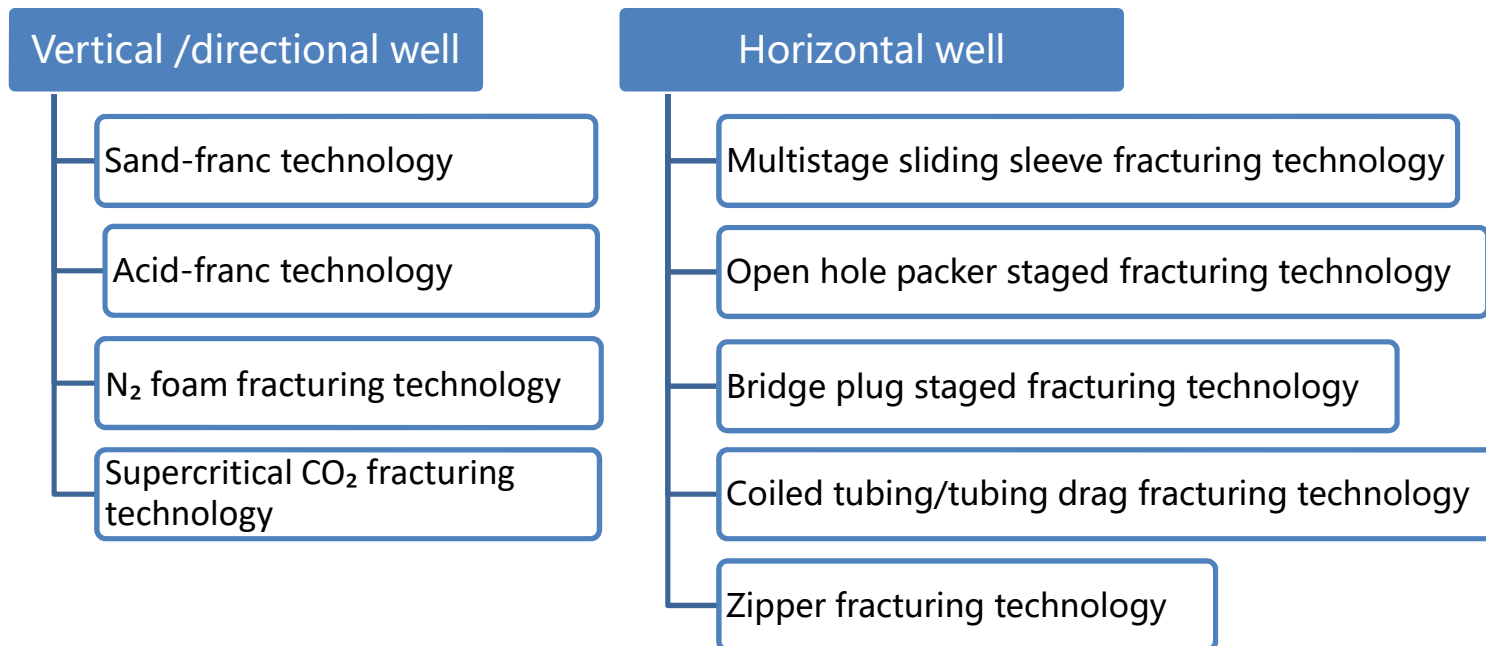
1.Frac Technology Overview

2.Introduction to frac technology

1.Frac Technology Overview

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Anton Fracturing has a full set of 105/140MPa and 200000 HHP fracturing equipment, high-quality technology and operation team, providing conventional and unconventional oil and gas field design, equipment and material integrated fracturing technical services, meeting the requirements of ultra-high pressure, large displacement and large-scale industrial fracturing. It has successfully implemented more than 3000 wells/8000 sections of fracturing operations, with the maximum construction pressure of 110MPa and the maximum displacement of 22m³/min. We have high-quality fracturing equipment resource strategic partners and global service capabilities.



1. Frac Technology Overview

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1. Conventional oil gas fracturing technology

Technical characteristics :

The capacity of 15000/20000 PSI and a displacement of more than 22 m³/min, applicable to conventional oil and gas wells

Services capabilities:

- General fracturing service
- 200,000 HHP fracturing equipment service
- Fracturing management and organization services
- Market Qualification of PetroChina, Sinopec and Yanchang Oilfield



2. Introduction to frac technology

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2. Zipper fracturing technology

Technical features:

- High construction efficiency
- Low risk of casing deformation
- High reuse rate of flowback liquid

Scope of application:

- It is applicable to all oil and gas wells developed by platform well group layout and horizontal well group fracturing, especially shale gas and tight oil and gas wells.

Service performance :

- More than 20 platform well groups have been fracturing completed in China, with more than 2000 construction sections.

Technical parameter :

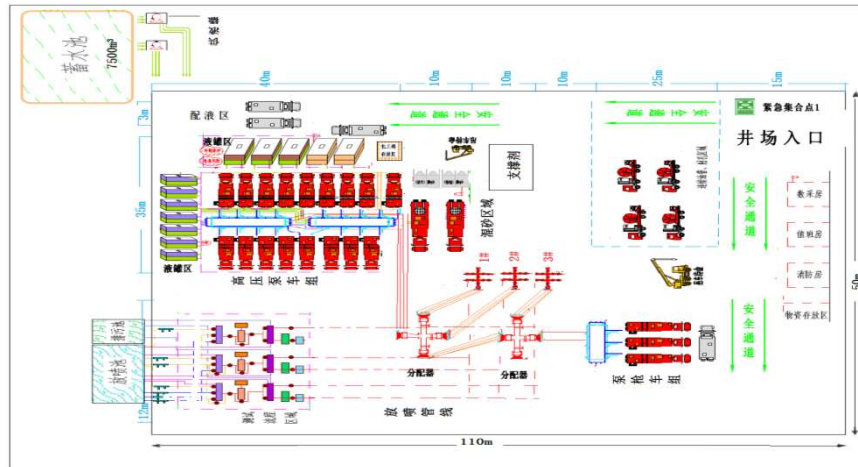
Fracturing unit	120000HHP
Maximum displacement	16~22m ³ /min
Manifold diameter	5" 1/8、7" 1/16
Maximum pressure	20000PSI



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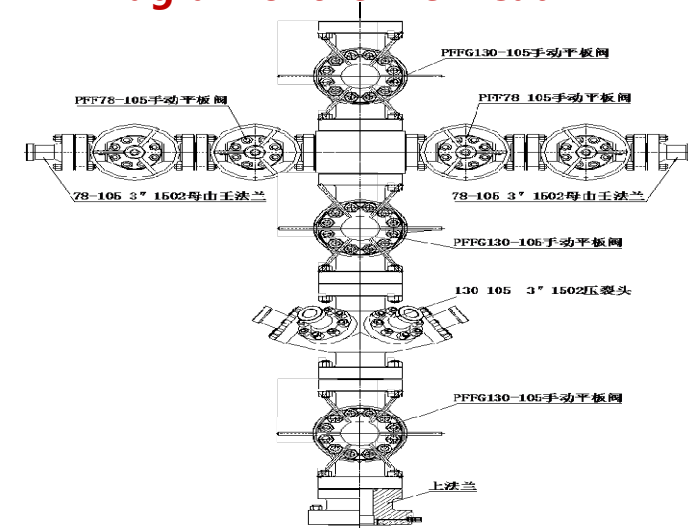
Standard Layout of Well Site



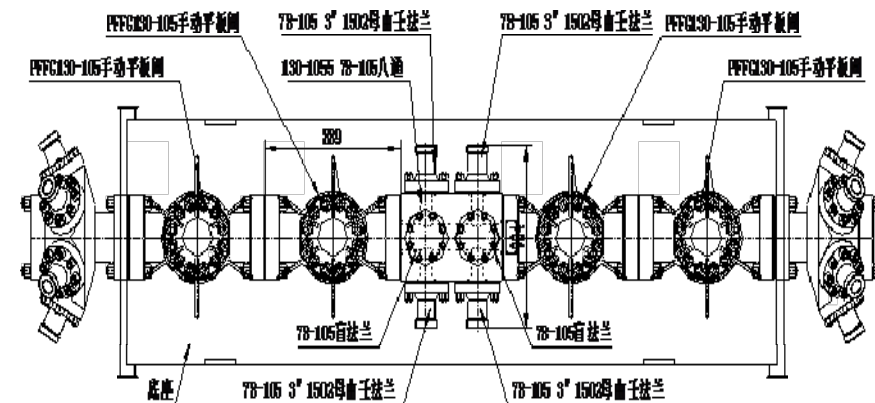
Large diameter manifold



Diagram of the Wellhead



Diverter manifold



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3. N2 foam fracturing technology

Technical parameter :

Equipment: fracturing unit and liquid nitrogen pump

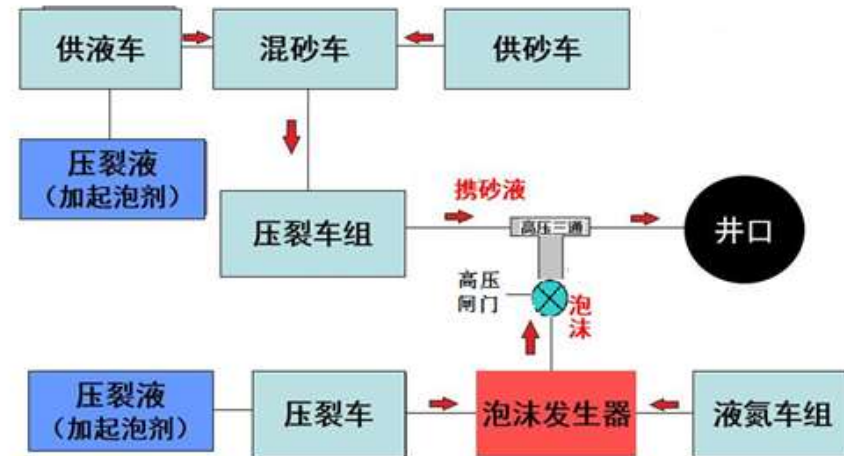
Medium: special fracturing fluid and liquid nitrogen

Fracturing level: 15000PSI

Displacement: 5-8m³/ min

Liquid nitrogen displacement: 1m³/ min

Nitrogen ratio: ≥ 52%



Technical advantages:

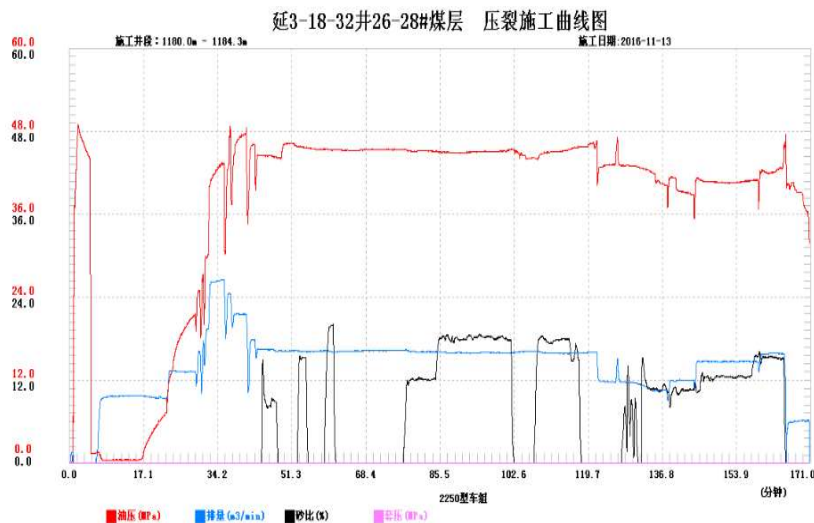
- Good filtration resistance, improving liquid efficiency;
- Foam has high apparent viscosity, low friction and strong sand carrying capacity;
- Nitrogen has large compressibility, high elastic energy, good drainage performance, and reduces reservoir pollution;
- Foam is stable when encountering water, defoaming when encountering oil, and water plugging is not oil plugging, which can effectively improve oil recovery;
- It is applicable to normal or low pressure reservoirs such as coal seams, carbonate rocks and sandstones, and also applicable to water sensitive formations.

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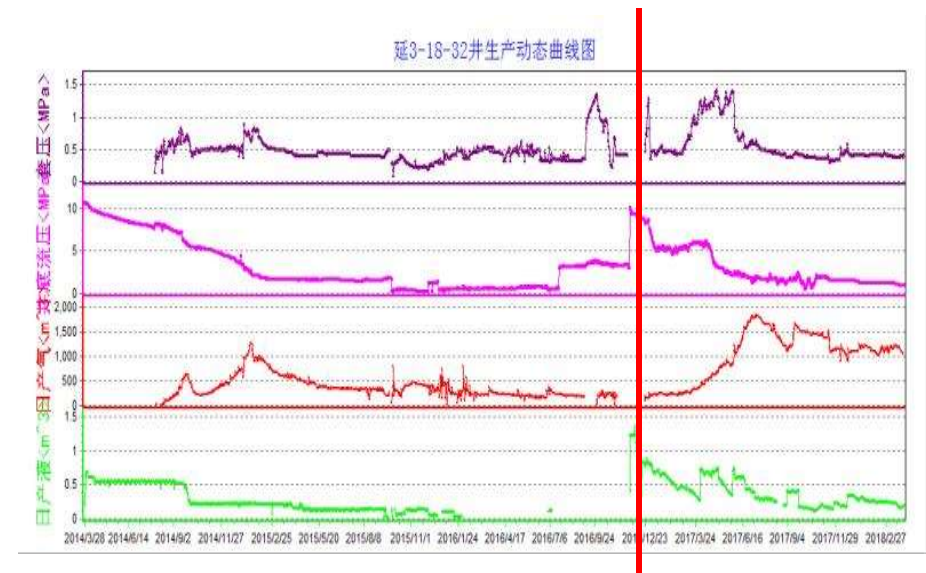
Application case:

Coalbed methane has been used for more than 10 wells, and the production after fracturing is 3~8 times of that before fracturing.



Fracturing parameters:

- (1) Displacement: 5.0-6.5m³/min
- (2) Foam concentrate 460m³Liquid nitrogen: 115t
- (3) Amount of sand added: 28m³



Fracturing effect: gas appears one month after fracturing, with the maximum daily gas production of 1846m³/d, flow pressure of 1.02MPa, daily liquid production of 0.2m³, and cumulative gas production of 73.59 × 10⁴m³.

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4. Supercritical CO₂ fracturing technology

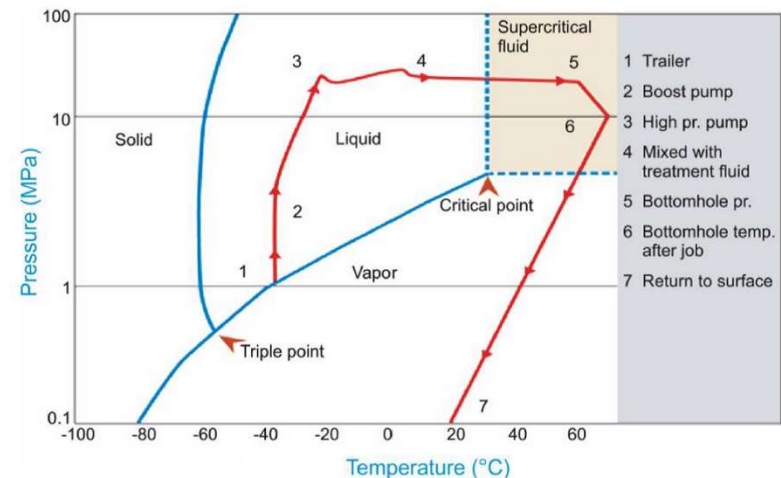
Technical features:

- Equipment: fracturing unit and CO₂ booster pump
- medium: special fracturing fluid and liquid CO₂ Fracturing level: 15000PSI
- Displacement: 5-12m³/min
- CO₂ displacement: 5-8m³/min
- sand ratio: 80%
- Proportion of water base : 30%
- Scope of application: low pressure/water sensitive formation

Technical advantages:

- Strong seam making ability and wide transformation volume.
- It has energy increasing effect and can delay the attenuation of formation pressure.
- It can inhibit the expansion of viscous minerals, increase energy and drainage, and reduce reservoir damage.
- It is soluble in crude oil, has viscosity reduction, capacity increase and gas drive effects, and improves the fluidity of underground crude oil. For gas reservoirs with adsorbed gas, hydrocarbon replacement with storage pressure higher than adsorption pressure can be realized to improve the recovery of adsorbed gas.

Mechanism Diagram of Supercritical CO₂



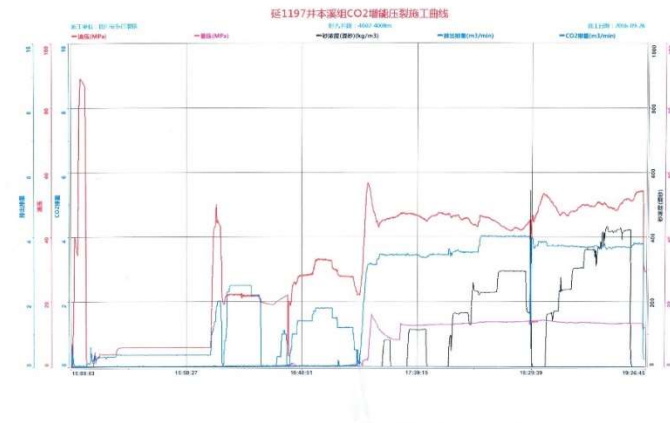
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Application case :

It has been applied in more than 10 wells in Sulige Oil and Gas Field and Yanchang Oil Mine, with the maximum well depth of more than 4000m.

延XX井: 4002m~4008m



Pre CO2 fracturing: CO₂ displacement 2.5m³/min, CO₂ fluid volume 60m³, fracturing displacement 3m³/min, maximum fracturing 56.8MPa, fracturing fluid 426m³, sand volume 53m³.

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5. Temporary plugging and diversion fracturing technology

Technical features : Adding solid temporary plugging agent in fracturing construction, temporarily plug in the fracture or the fracture opening, form new fractures, expand the fracturing swept volume, and achieve better production increase effect.

Equipment characteristics : Different types of temporary plugging agents are equipped with special adding equipment.



- Small particle (< 5mm)
- Adding into blender
- Addition speed 30-60kg/min

- Big particle (6-12mm)
- Special hydraulic end
- Maximum concentration

- Blocking ball/temporary blocking knot
- Special bowler

200kg/m³

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6. Sand fracturing technology for carbonate

Technical features :

- Expand oil drainage area and increase production
- A variety of proppant, stable crack support, good permeability

Scope of application :

- Carbonate reservoir

Technical capability :

- Provide comprehensive technical services such as reservoir evaluation, stimulation and reconstruction plan, and post fracture evaluation;
- Support global mainstream software;
- Fracturing unit with more than 100000 HHP;
- Strategic cooperation with many petroleum universities and research institutions ;
- Rich experience in horizontal well fracturing service.

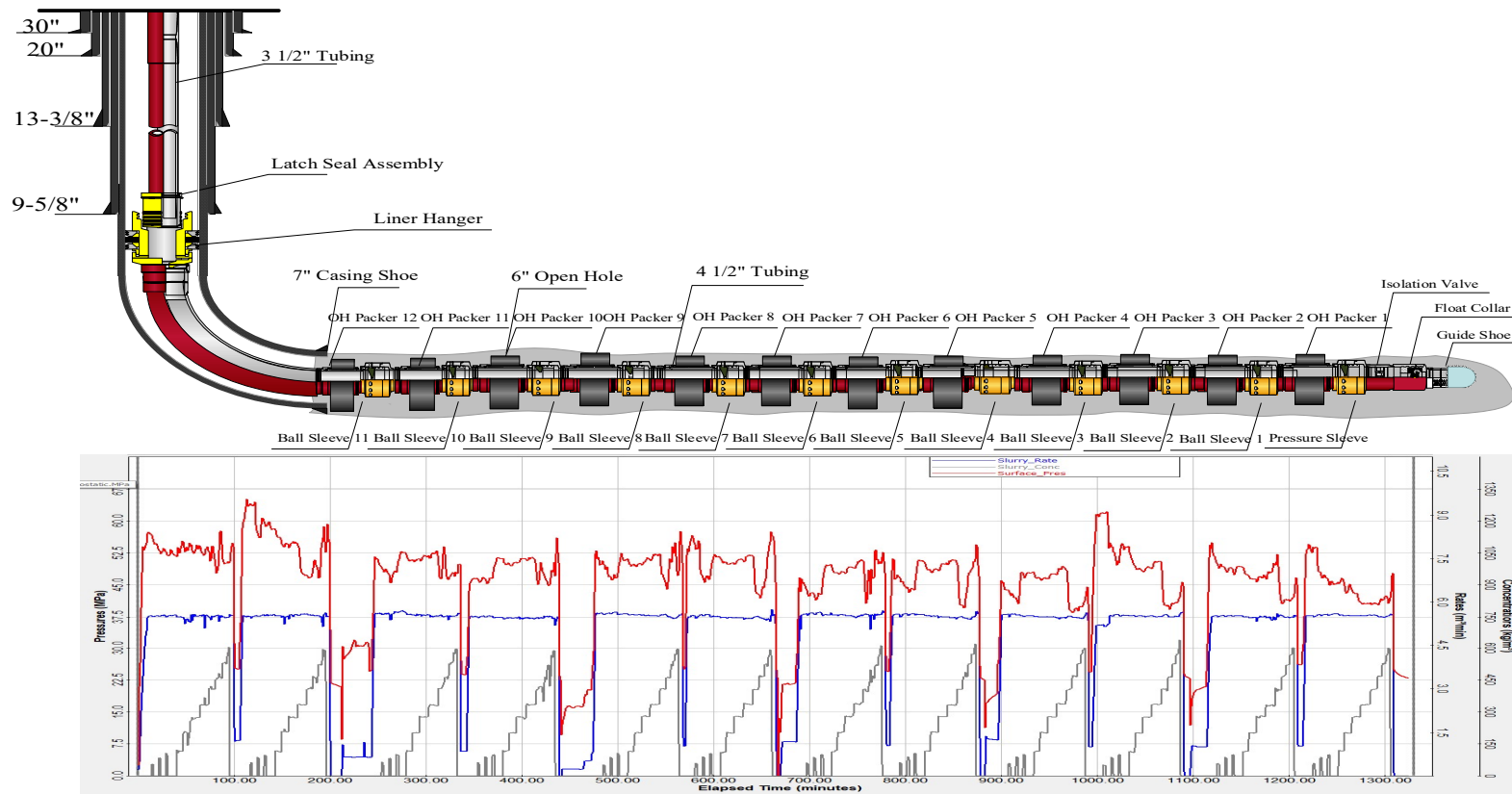


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Application case :

Since 2016, more than 20 wells of carbonate fracturing operations have been carried out in Iraq and Kazakhstan, including staged sand fracturing of 15 level horizontal wells, providing an effective way for the development of low permeability carbonate reservoirs.



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