

**ANTON 安東**



# Antonoil Drilling Fluid Service Introduction

**东方智慧 全球分享**  
Oriental wisdom , Global sharing

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Important Accomplishment

## 1.1 R&D Center

The R&D Center mainly engage:

- System Research
- Production Quality Control
- Technical Support



## 1.2 Mud Plant

Our company have abundant mud plant construction and management experience.

**1200m<sup>3</sup> Mud Plant in  
BaiCheng Xinjiang**



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Drilling Fluid System

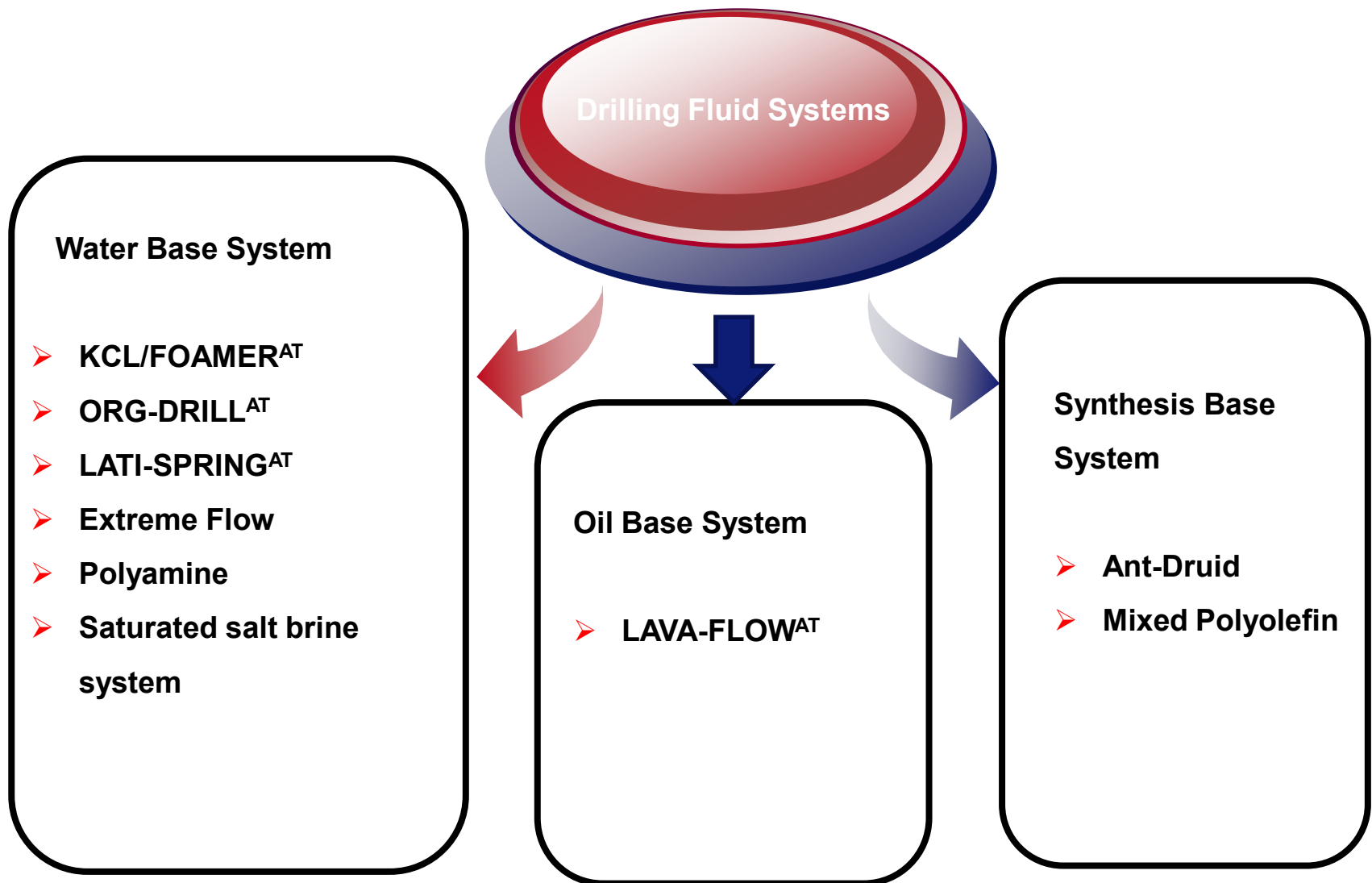
03

Drilling and Completion Fluid Chemical

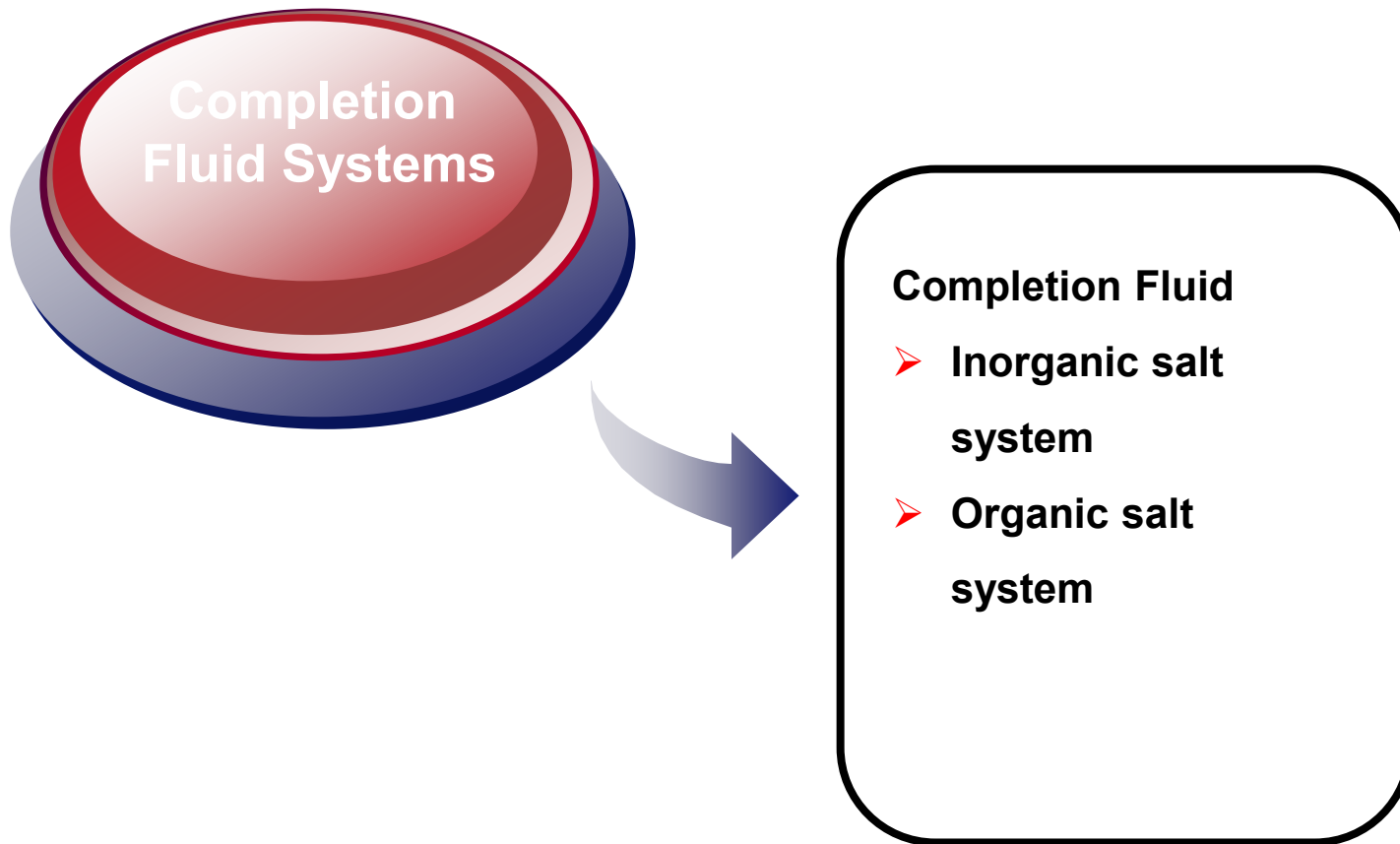
04

Important Accomplishment

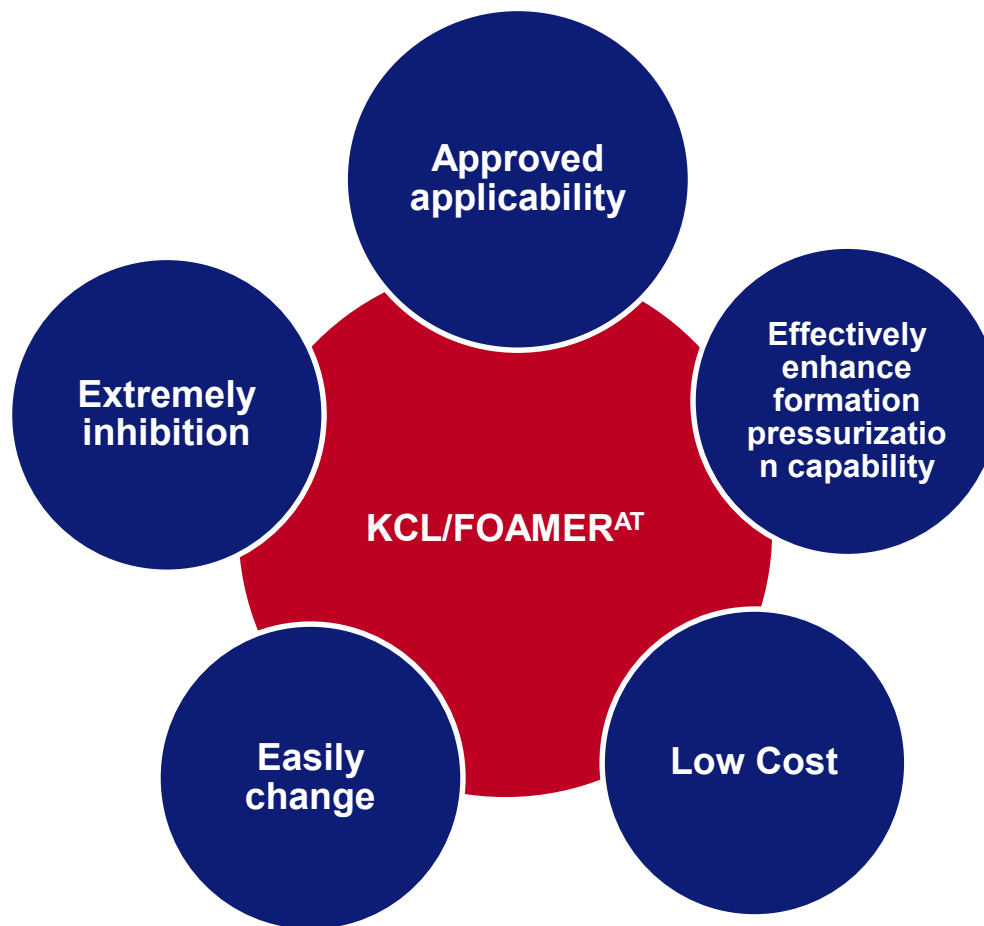
## 2. Drilling Fluid Systems



## 2. Drilling Fluid Systems



### Advantages





## 2.1 KCL/FOAMER<sup>AT</sup>

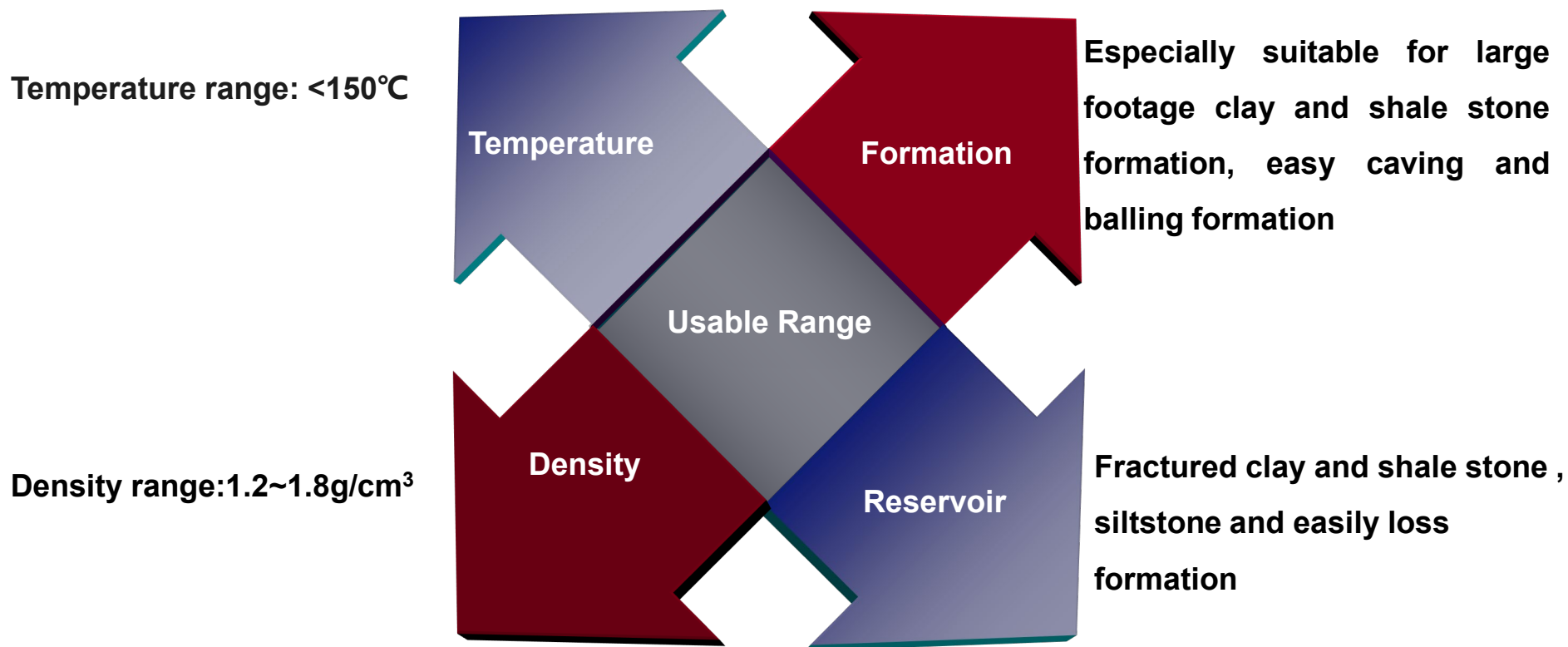
### Parameters

Parameter	Value
Density (g/cm <sup>3</sup> )	1.20 ~ 1.80
FV (s)	40 ~ 90
YP (Pa)	5 ~ 12
PV (mPa.s)	10 ~ 25
GEL (10'/10''Pa)	2 ~ 3/3 ~ 10
API FL (ml)	< 5
MBT (g/L)	35 ~ 50
PH	9 ~ 10
KCL concentration (%V)	5~7

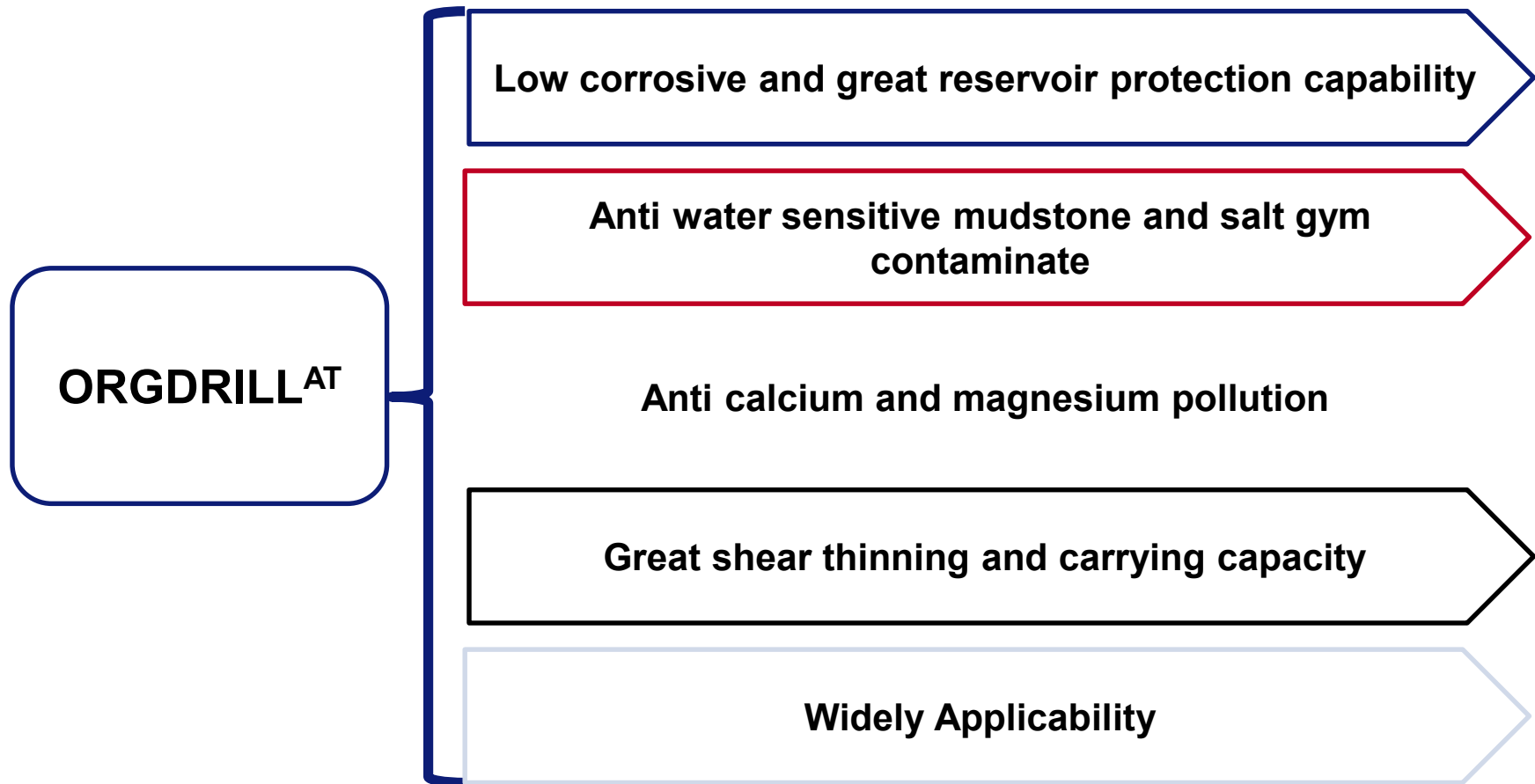
**Major material: PAC\XCD\KPAM\SMC\SPNH\SMP\FT-1A\KCL\AT-former etc.**

## 2.1 KCL/FOAMER<sup>AT</sup>

### Range of application



### Advantages



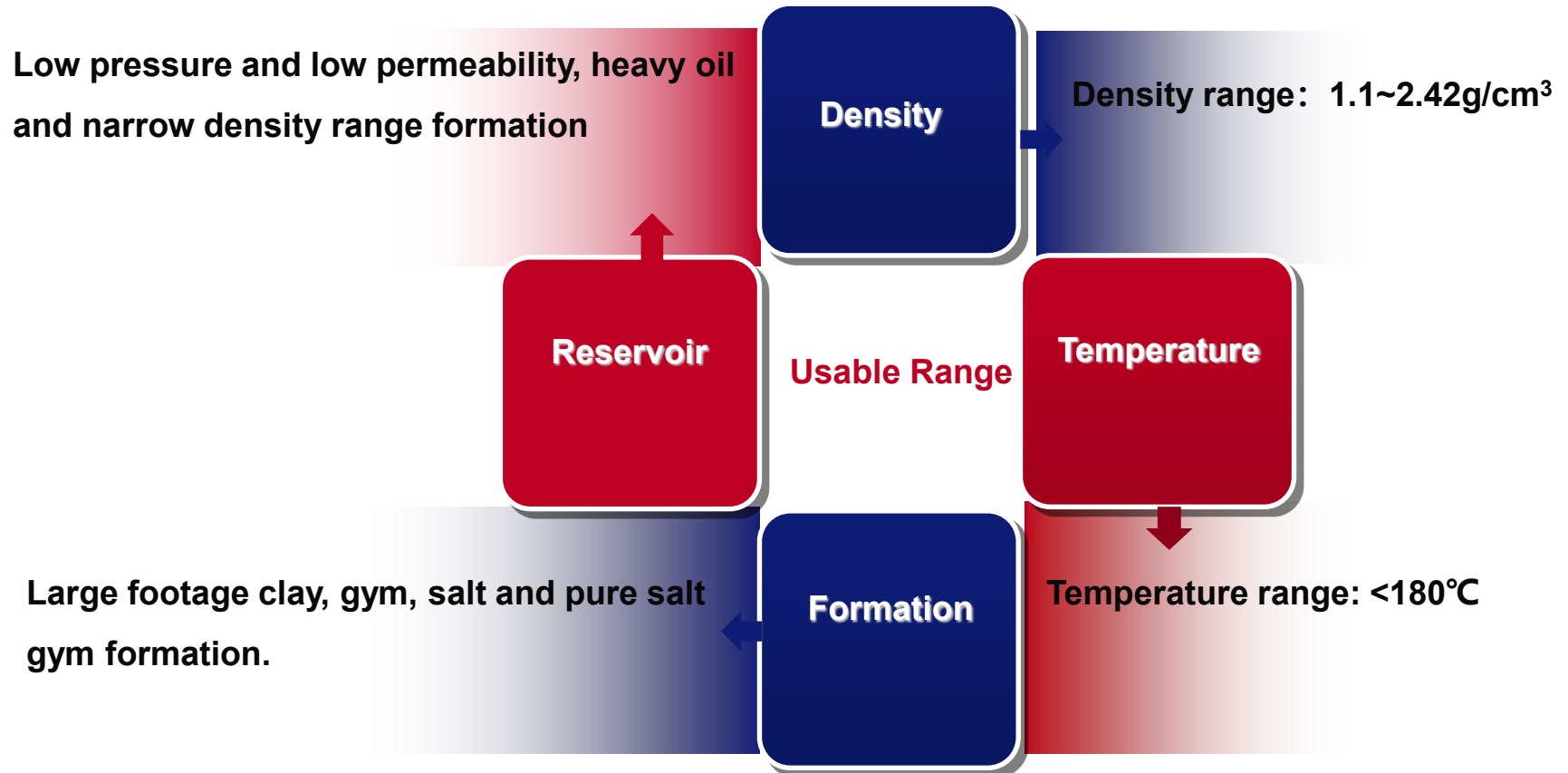
## 2.2 ORGDRILL<sup>AT</sup>

### Parameters

Parameter	Value
Density (g/cm <sup>3</sup> )	1.10 ~ 2.42
YP (Pa)	4.5 ~ 16.5
PV (mPa.s)	17 ~ 60
GEL (10 <sup>3</sup> /10 <sup>3</sup> Pa)	2 ~ 5/3 ~ 8
API FL (ml)	< 5
HTHP FL (ml)	< 15

**Major material: AT-W2\AT-W3\AT-W4\XCD\AT-Redul1\AT-Redulsh\AT-Viscol\AT-PGCS\AT-NTF\AT-ZDY etc..**

### Range of application



## 2.3 LATI-SPRING<sup>AT</sup>

### Advantages

**LATI-SPRING<sup>AT</sup>**

**Strong sealing ability**

**Extremely inhibition ability**

**Environment friendly**

**Especially suitable for  
Shale gas development**

**Good rheological properties and lubricity**

## 2.3 LATISPRING<sup>AT</sup>

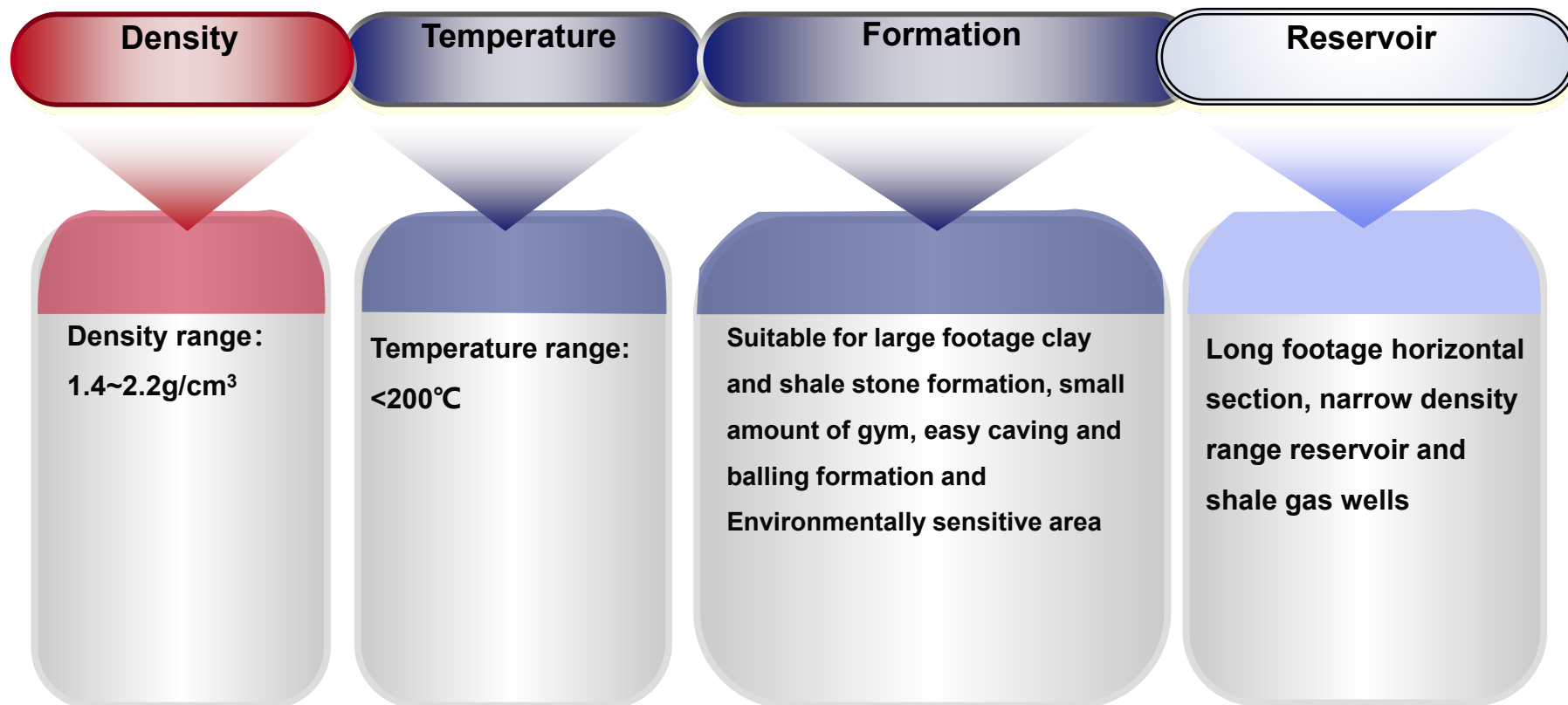
### Parameters

Parameter	Value
Density (g/cm <sup>3</sup> )	1.4 ~ 2.2
PV (mpa.s)	40 ~ 90
YP(Pa)	6 ~ 16
$\Phi_6/\Phi_3$	5 ~ 10/3 ~ 8
$G_{10}''/I_{10}'$ (Pa/Pa)	3 ~ 8/5 ~ 15
API,mL	≤3
HTHP, mL	≤5
PH	9 ~ 10.5
MBT	7 ~ 14
kf	0.0612 ~ 0.1673

**Major material: AT-Poly\AT-thin\AT-Calovis\AT-Supreme\AT-Calosperse etc.**

## 2.3 LATISPRING<sup>AT</sup>

### Range of application





## 2.4 Extreme Flow

### Advantages

- 1 Be stable up to 200°C, excellent high temperature stability and suspension capability
- 2 Good performance in gypsum, formation salt water & cutting solid contamination
- 3 Perfect rheological performance in high density and temperature
- 4 Additives environment-friendly
- 5 Simple mixing and maintenance in field service

## 2.4 Extreme Flow

### Parameters

The performance parameters of different strata

T	$\rho$	PV	YP	G10''/G10'	API	HTHP	pH	Cl <sup>-</sup>
°C	g/cm <sup>3</sup>	Pa	Pa	Pa	mL	mL	/	mg/L(10 <sup>4</sup> )
100-120	1.80-1.90	20-60	≥10	2-5/4-10	≤3	≤8	8.5-10	/
150-160	2.30-2.40	45-85	≥15	1-5/5-18	≤5	≤12	8.5-10	15-17
170-190	1.80-1.90	35-75	≥13	1-3/5-15	≤5	≤10	8.5-10	10-13

## 2.4 Extreme Flow

### Range of application

**High temperature & deep well, ultra-high density wells**

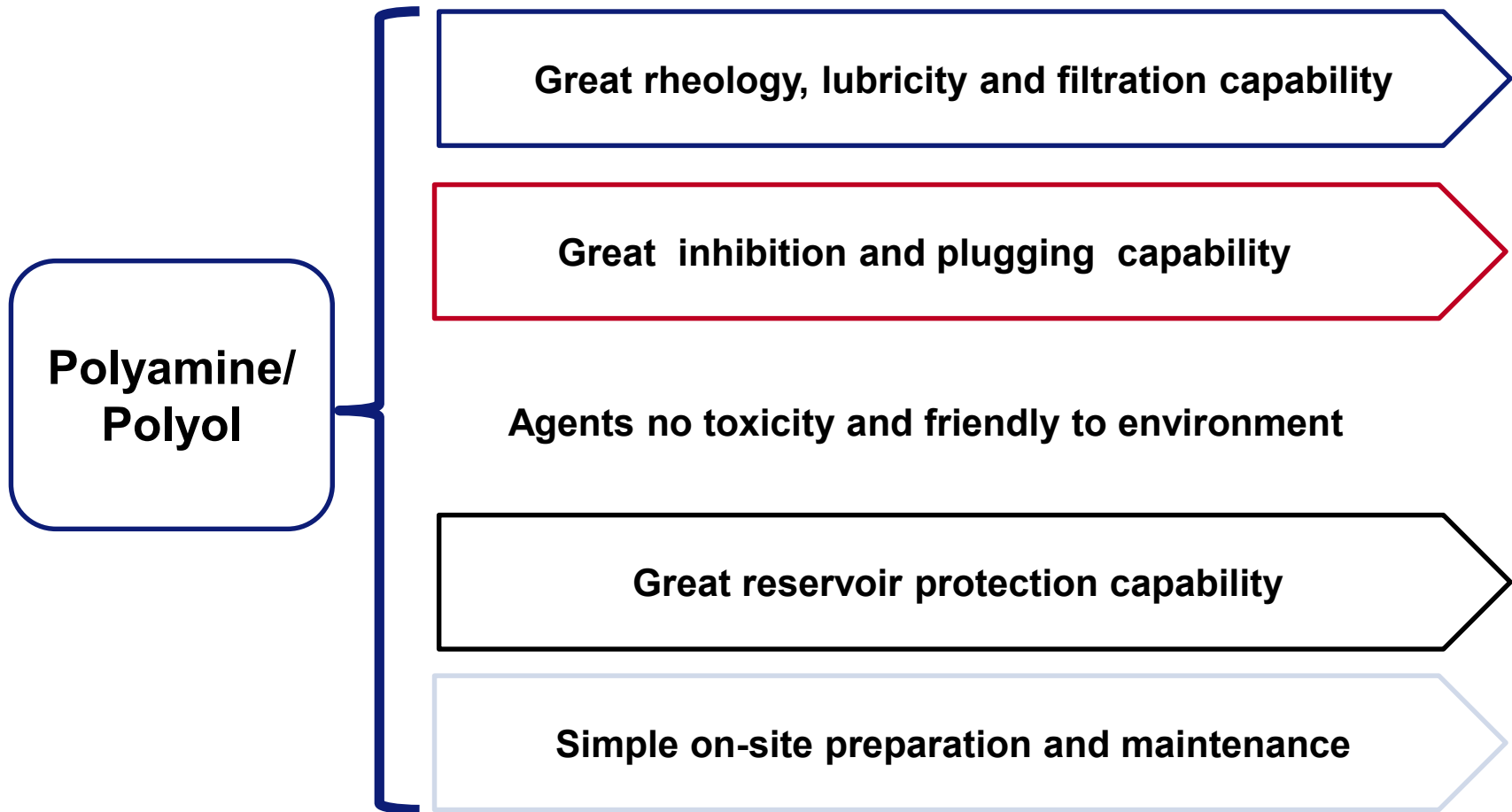
**Susceptible to salt, gypsum stratum pollution**

**A horizontal well with easily hydrated dispersed swelling and wellbore instability**

**Environmental sensitive and environmental demanding areas**

## 2.5 Polyamine MS

### Advantages



## 2.5 Polyamine MS

### Parameters

Parameter	Value
Density (g/cm <sup>3</sup> )	1.05 ~ 1.50
PV (mPa.s)	10 ~ 30
YP (Pa)	5 ~ 15
GEL (10'/10''Pa)	2 ~ 4/4 ~ 10
API FL (ml)	< 5
HTHP FL (ml)	< 12
EC50(mg/L)	60000

Major material: AT-HP\AT-Redulsh\AT-JDFAT-Viscol\AT-PGCS\AT-POLYAMINE\FORMATE etc..

## 2.5 Polyamine MS

### Range of application

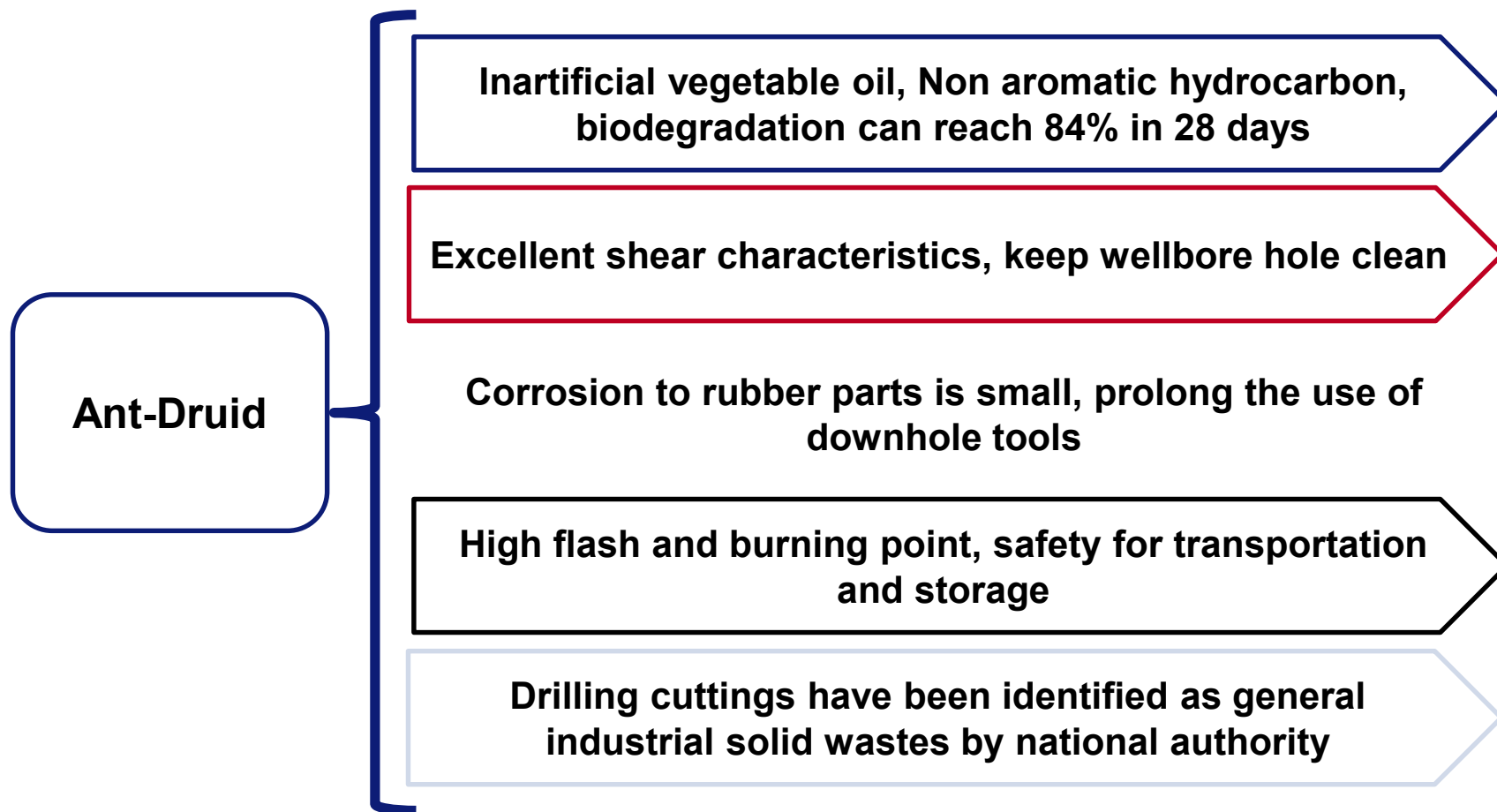
**Temperature range:  $<150^{\circ}\text{C}$**

**Density range:  $1.05\sim 1.50\text{g/cm}^3$**

**Easily hydrated dispersed swelling and wellbore instability formation**

**Environmentally sensitive and strictly demanding areas**

### Advantages



## 2.6 Ant-Druid<sup>AT</sup>

### Parameters

Parameter	Value
Density (g/cm <sup>3</sup> )	1.10 ~ 2.45
YP (Pa)	4 ~ 15
PV (mPa.s)	17 ~ 70
GEL (10'/10''Pa)	2 ~ 5/5 ~ 10
HTHP FL (ml)	< 6.0
ES	> 600

**Major material: ATMUL-HT\ATCOAT-HT\ATGEL\ATTROL-HT etc.**



### Range of application

$K_f < 0.1$ , suitable for horizontal wells, high angle wells, large displacement wells and branch wells

**Inhibition**

Effectively inhibit the hydration expansion of mudstone and shale formation, keep borehole instability

**Lubricity**

**Usable Range**

**Temperature**

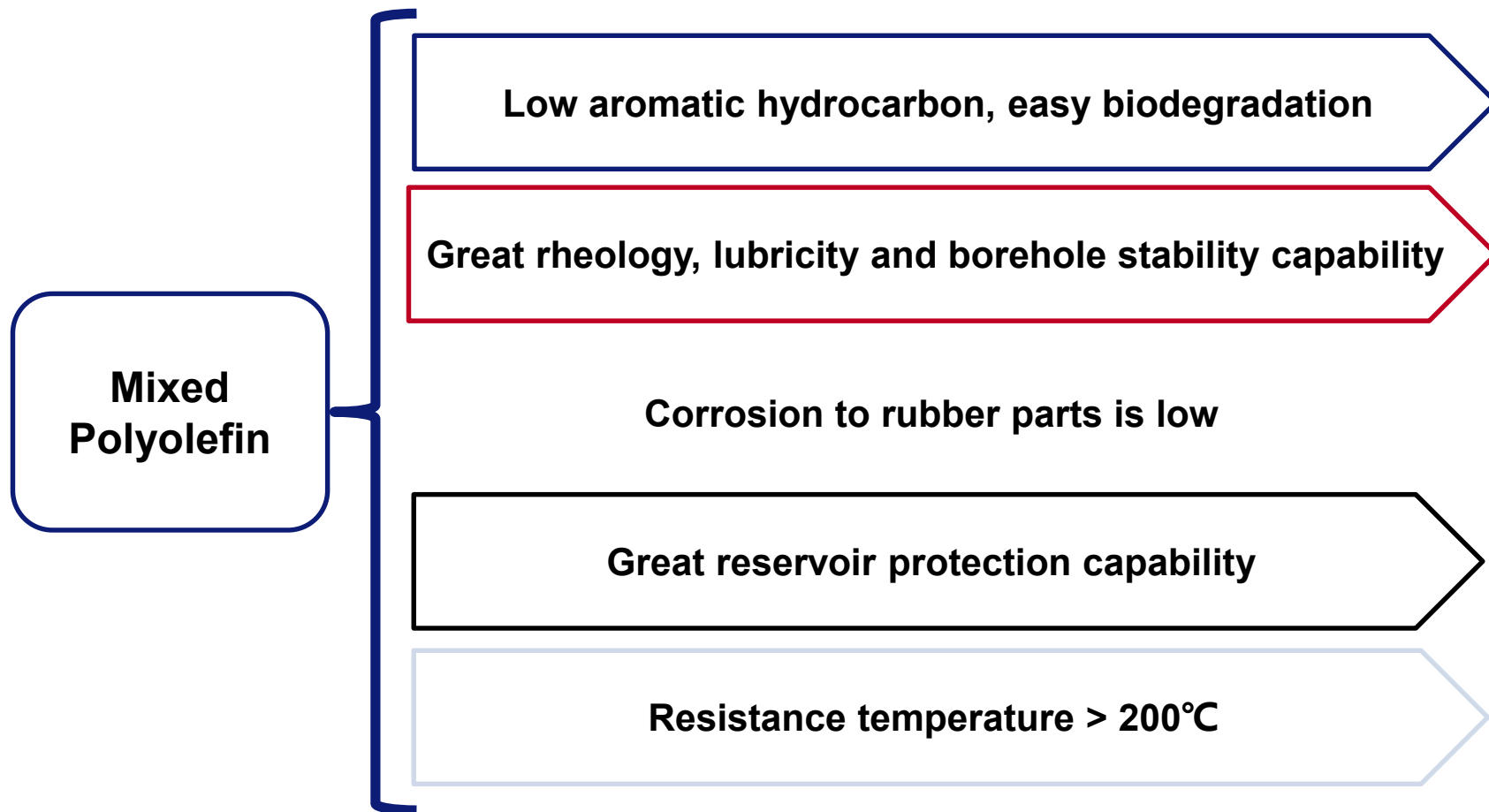
The region is environment sensitive, high environmental protection requirements

**Environment**

Resistance temperature  $> 200^{\circ}\text{C}$ , suitable for all kinds of onshore and offshore HTHP wells.

## 2.7 Mixed Polyolefin

### Advantages



## 2.7 Mixed Polyolefin

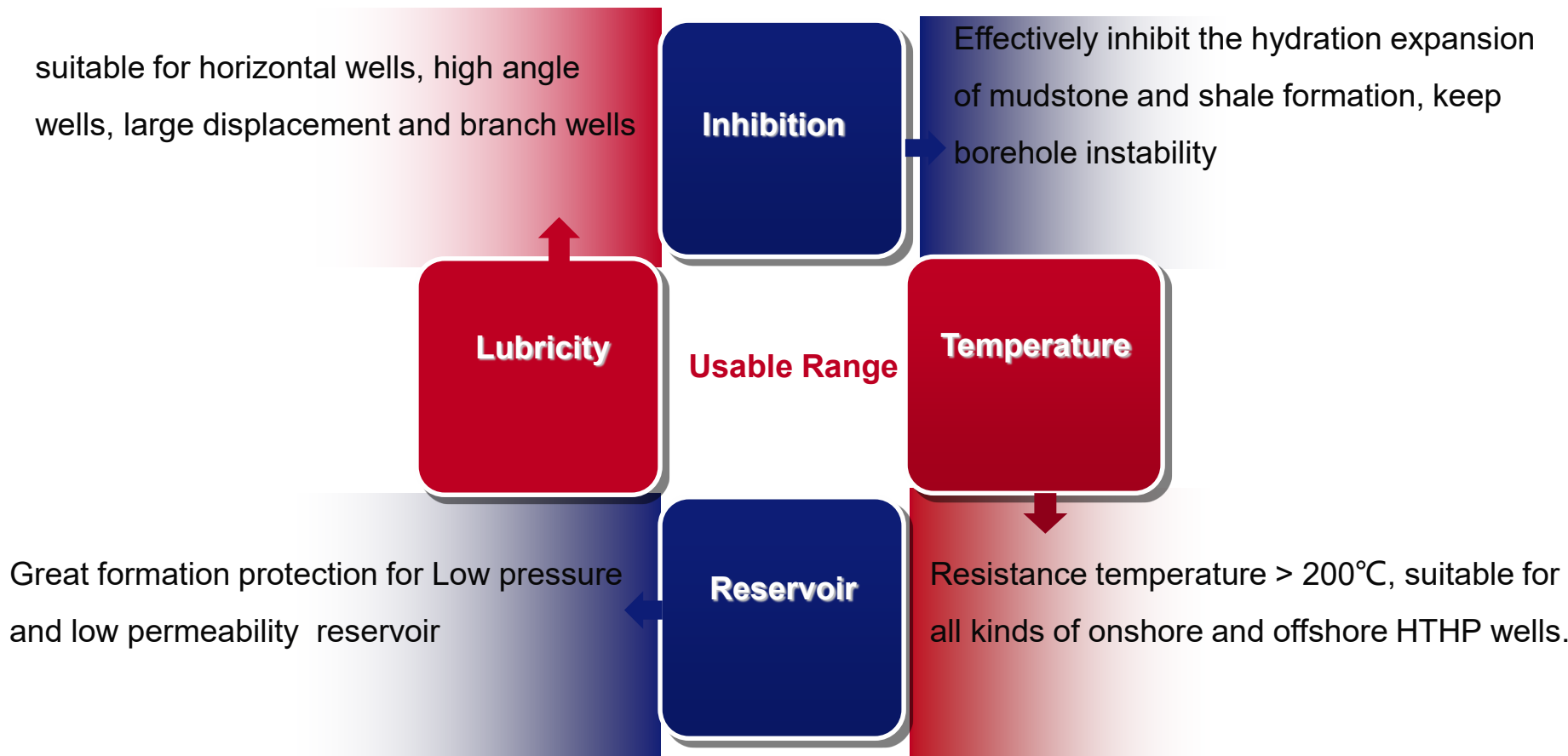
### Parameters

Parameter	Value
Density (g/cm <sup>3</sup> )	1.05 ~ 2.30
YP (Pa)	5 ~ 15
PV (mPa.s)	15 ~ 65
GEL (10 <sup>7</sup> /10 <sup>9</sup> Pa)	2 ~ 5/3 ~ 10
HTHP FL (ml)	< 10
ES	> 600

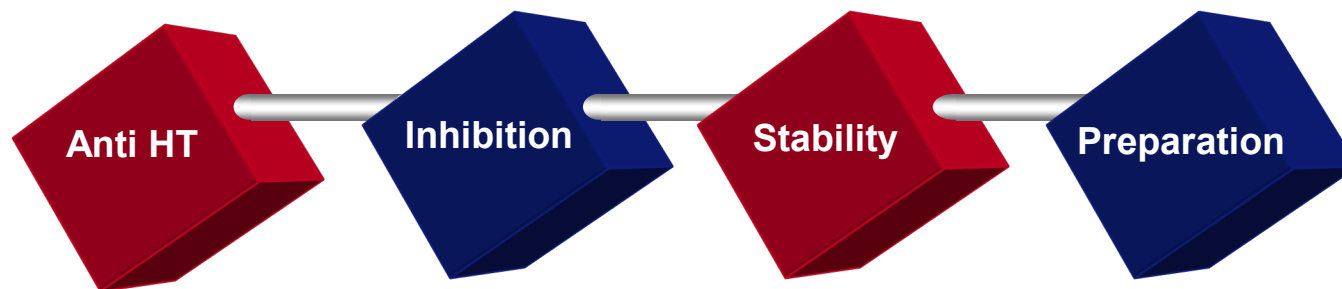
**Major material: ATMUL-HT\ATCOAT-HT\ATGEL\ATTROL-HT etc.**

## 2.7 Mixed Polyolefin

### Range of application



### Advantages



Good thermal stability and temperature tolerance 200°C

Non active water phase and applicable to all kinds of complex formation

Better emulsifying stability, Strong anti mud stone and salt water pollution ability

Simple type of treatment agent, easily change and maintain

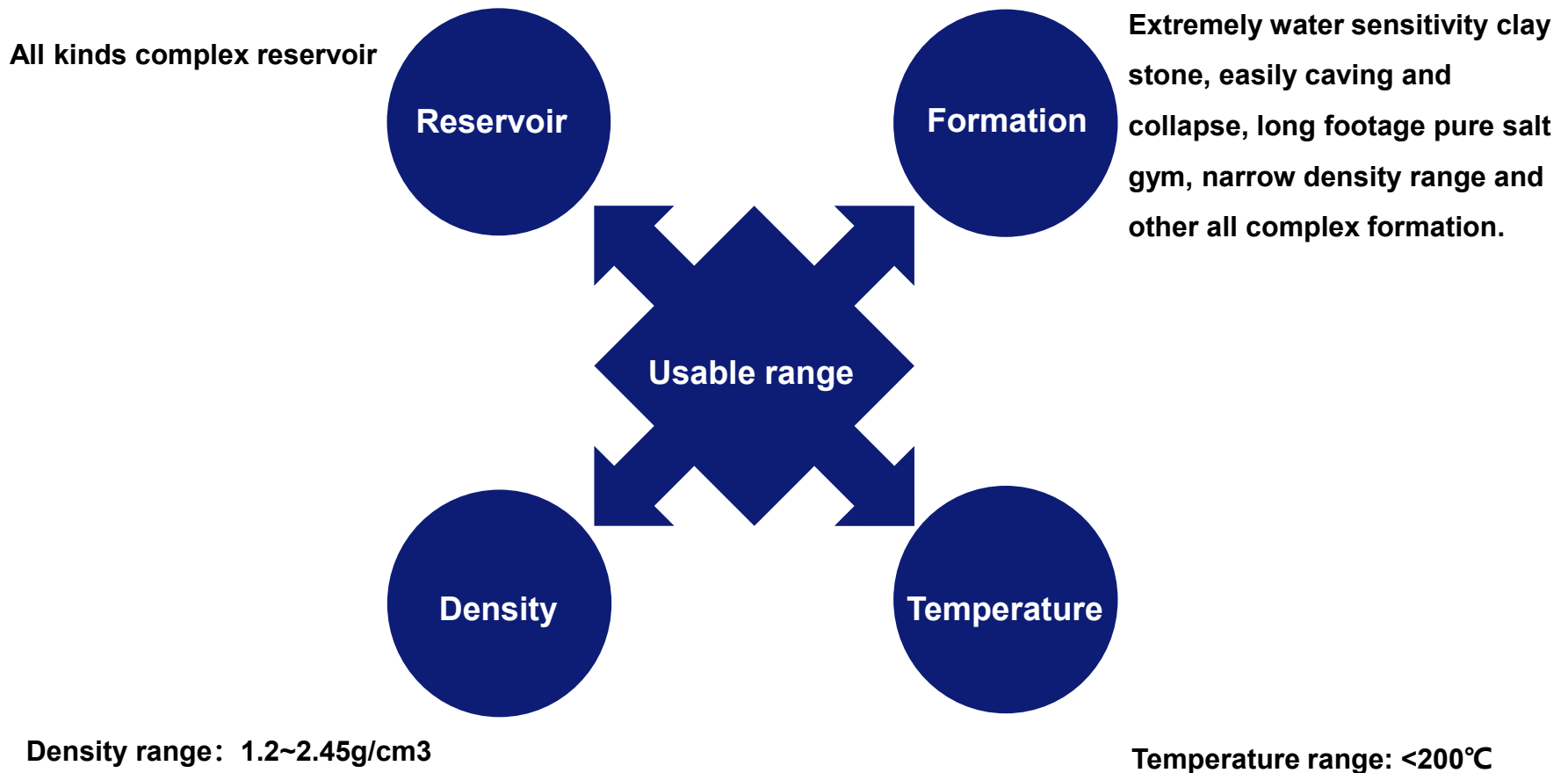
## 2.8 LAVA FLOW<sup>AT</sup>

### Parameters

Parameter	Value
Density (g/cm <sup>3</sup> )	1.20 ~ 2.45
YP (Pa)	10 ~ 25
PV (mPa.s)	≤75
GEL (Pa)	2 ~ 5/5 ~ 10
ES (V)	≥600V
HTHP FL (ml)	≤6.0

Major material: ATMUL-HT\ATCOAT-HT\ATGEL\ATTROL-HT etc.

### Range of application



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Important Accomplishment



## 3.1 Conventional chemical

### Water Base Drilling fluid chemical

NO.	Chemical name	Function
1	HP	Flocculating Agent
2	PL	Filtration Reducer
3	XCD	Viscosifier
4	PAC-LV	Filtration Reducer
5	PAC-HV	Viscosifier
6	EX-DRILL FL	Filtration Reducer
7	EX-DRILL HT	Filtration Reducer
8	EX-POLYSEAL	Anti-collapse
9	YLA	Lubricating anti sloughing agent
10	EX-FLOW	Filtration Reducer
11	EX-THIN	Viscosity reducer
12	AT- PEG	Anti-collapse
13	AT-NA	Plugging agent
14	AT-AP1	Inhibitor
15	AT - SLOP	Oil Soluble Plugging Agent
16	AT-RH4	Bit cleaner

## 3.1 Conventional chemical

### Completion fluid chemical

NO.	Chemical name	Function
1	ZnBr <sub>2</sub>	inorganic salt weighting agent
2	CaBr <sub>2</sub>	inorganic salt weighting agent
3	KCL	inorganic salt weighting agent
4	CaCl <sub>2</sub>	inorganic salt weighting agent
5	AT-Bio	Bactericide
6	AT-scavenger	Oxygen scavenger
7	AT-ZH <sub>2</sub>	Anti-corrosive agent
8	HEC	Viscosifier
9	Citric	PH conditioning agent

## 3.2 Specific chemical

### LATI-SPRING<sup>AT</sup> series

NO.	PRODRILL Series	Function
1	AT-Poly	Flocculating Agent
2	AT-thin	Thinner and Filtration Reducer
3	AT-Calovis	Filtration Reducer
4	AT-Supreme	Anti-collapse
5	AT-Calosperse	Anti-collapse Agent

## 3.2 Specific chemical

### LAVAFLOW<sup>AT</sup> series

NO.	Oil Base Series	Function
1	ATMUL-HT	Primary Emulsion
2	ATCOAT-HT	Second Emulsion
3	ATROL	API Filtration Reducer
4	ATROL-HT	HTHP Filtration Reducer
5	AT-WET	Wetting Agent
6	AT-ONEMUL	One Emulsion
7	ATGEL-HT	Organophilic clay

## 3.2 Specific chemical

### LCM Chemical

NO.	Loss Circulation Material Series
1	AT-LCM
2	AT-LCM2
3	AT-LCM3
4	QDL-1
5	SDF-3
6	AT-GSD

## 3.2 Specific chemical

### Introduction of AT-LCM Series



**AT-LCM1**



**AT-LCM2**



**AT-LCM3**

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### ➤ Application of Lava Flow<sup>AT</sup> in KESHEN Block of TARIM Oilfield

#### □ Block Profile

The geological development of this block, the depth of oil and gas burial, the large salt-paste layer, and the ultra-high temperature and pressure at the bottom of the well are all difficult problems in the international scope. The maximum depth: 8038m, the maximum bottom temperature: 180 °C ;

#### □ Performances

- ✓ 80 Wells have been successfully constructed
- ✓ The maximum density: 2.85g/cm<sup>3</sup>
- ✓ Effectively solve the problem of high density and high temperature high pressure block
- ✓ The application effect of oil-based mud is remarkable



## 4.Important Accomplishment

### ➤ ANT-Druids Biosynthetic Base Drilling Fluid System

#### □ Well Profile

Depth (m)	Horizontal length (m)	Dev. (°)	MW (g/cm <sup>3</sup> )	Footage (m)	Bottom temperature( °C)
4730	1500	89	1.90	3151	110

#### □ Performances

- ✓ The successful implementation of "one trip" of the trial wells, the footage is 2318 meters;
- ✓ Periodic drilling cycle is only 16 days;
- ✓ The horizontal length of 1500 meters, the average ROP of 9.74 meters / hour, the drilling time is 9.1 days, refresh the average record of ROP and drilling cycle for horizontal interval on shale gas project in Sichuan oil and gas field;
- ✓ Single well drilling cycle 56 days, refresh the single well drilling cycle record.

### ➤ Application of Multicomponent Synergistic Drilling Fluid System

#### ❑ Block Profile

- ✓ In Jurassic and Triassic strata, mud lost (29%) and sticking (33%) are easy to occur;
- ✓ The total amount of clay minerals in Jurassic sangonghe formation and Triassic strata is up to 55%, and the rolling recovery rate of fresh water is only 15.12%. The formation has strong hydration and dispersion characteristics, which is easy to cause wellbore instability.

#### ❑ Performances

- ✓ The highest rolling recovery rate was 94.6 %.The maximum linear expansion rate was 13.46% at 16h. The system effectively improved the hydration dispersion and expansion of mud shale, and ensured the stability of wellbore wall;
- ✓ The plugging agent formula (4#) has wide adaptability to cracks, and can seal 1~3mm cracks and bear pressure of 7MPa.
- ✓ The complex time rate decreased to 1.3%, the average loss per well decreased by 154m<sup>3</sup>, and the loss per well treatment time decreased by 62.6h.

**ANTON 安東**

**THANKS!**

Helping others succeed...