



TERVES

ENGINEERED RESPONSE

TervAlloy™ 1331

PRODUCT DESCRIPTION: LOW SALINITY DISSOLVABLE ALLOY

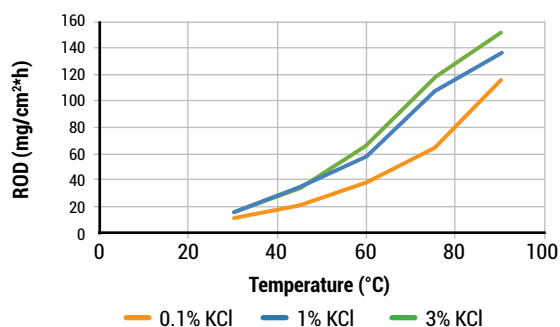
TervAlloy™ 1331 is the latest *freshwater* low temperature version of Terves' patented dissolvable magnesium for oil and gas applications. This new alloy successfully bridges the gap between existing low salinity alloys and true freshwater-dissolvable alloys. **TervAlloy 1331** is unique in that it has the dissolution characteristics of our TervAlloy 1530 (FW), but unlike 1530, is available in both tubulars and solids, and offers mechanical performance not only superior to our 1530 product.

TervAlloy 1331 can be purchased in the same variety of shapes offered across the TervAlloy range (including cost-saving tubulars) in lengths up to 48 inches (in increments of 6 inches), and also in frac ball configurations up to 4.95 inches in diameter.

Physical Data

Density 1.84 g/cm³

1331 Dissolution vs Temperature



Dissolution Rates in Common Mediums for TervAlloy 1331 (mg/cm² hr)

Temp (°C)	0.1% KCl	1% KCl	3% KCl
30	5	8	8
45	13	18	18
60	20	30	33
75	30	55	60
90	50	69	76

Mechanical Data

4" Solid Rod 5:1 Extrusion Ratio

Ultimate Tensile Strength (ksi)	32.0
Yield Strength (ksi)	22.0
Elongation ¹ (%)	5.0
Double Shear (ksi)	18.7
Compressive Strength (ksi)	60.2

¹Longitudinal values



TervAlloy™ 1331
machined parts and frac ball



- Based on the standard solution of KCl the TervAlloy dissolves in ranked from **0 to 3** (3 requires the highest salinity)
0: 0.01% KCl
1: 0.1% KCl
2: 1.0% KCl
3: 3.0% KCl
- Based on the rate of dissolution in the determined solution (see first number as noted above) at 60°C, ranked from **0 to 5** (5 being the highest/fastest)
0: 0-9 mg/cm²hr
1: 10-19 mg/cm²hr
2: 20-29 mg/cm²hr
3: 30-39 mg/cm²hr
4: 40-49 mg/cm²hr
5: 50-59 mg/cm²hr
- Based on the average ultimate tensile strength (UTS) ranked from **0 to 6** (6 being the highest) (**3**)
- Based on the elongation, ranked from **0 to 4** (4 being the highest rate of average elongation) (**1**)



TERVALLOY SELECTION GUIDE

TervAlloy™ 1331 is the latest *freshwater* low temperature version of Terves' patented dissolvable magnesium for oil and gas applications. Below are some comparative charts outlining mechanical properties and dissolution rates for our TervAlloy product line:

TervAlloy Comparative Dissolution Rates (mg/cm²hr)

Salinity (%KCl)	Temp (°C)	TervAlloy 3241 (TAx 100E)	TervAlloy 3042 (TAx 50E)	TervAlloy 1530 (TAx FW)	TervAlloy 1132 (TAx FW+)	TervAlloy 3143 (TAx HD)	TervAlloy 1331
0.1	30	-	-	17	4	-	5
	45	5	-	34	6	3	13
	60	9	-	52	11	9	20
	75	12	1	84	15	12	30
	90	17	3	118	37	16	50
1	30	3	-	24	13	2	8
	45	10	-	48	25	8	18
	60	18	2	70	48	14	30
	75	25	3	132	74	19	55
	90	33	8	187	75	25	69
3	30	4	-	24	16	2	8
	45	13	-	51	29	9	18
	60	22	3	91	56	17	33
	75	34	5	148	90	24	60
	90	46	9	233	117	33	76

DISCLAIMER: The information provided in this document is intended to assist manufacturers and specifiers in the selection and use of Terves' products. All data noted should be understood to be average and expected performance, and is provided to serve as a general guideline only. This information **does not represent and is not to serve as minimum specification standards**. For further information contact Terves directly. All Terves commercially available products have patents or patents pending in the United States and in a variety of countries. For the latest patent information on this specific product contact Terves directly.

Terves products are covered by one or more of the following U.S. patents and patent applications: US 9,903,010; US 9,757,796; US 10,329,653; US 10,625,336; US 10,689,740; US 10,724,128; US 10,760,151; US 2020/029981; US 11,167,343; US 2021/0101204 and US 2019/0345585