

# TG-411 Flexible Graphite

Technical Data Sheet 443

## Product Family - Single Layer Material (Service to 450°C)

- TG-411 - 99.998% Graphite
- GTA - Nuclear 99.8% Graphite
- TG-312 - 99.8% Graphite
- GTE - 98% Graphite
- GTC - 97% Graphite
- TG-337 - 97% Graphite

## Product Overview

GRAFOIL® TG-411 flexible graphite is highly purified for applications requiring ultra-high purity levels.



## Typical Properties\*

Characteristic	Typical Value
Thickness	0.015" (0.38 mm)
Sheet Dimensions	18.11" x 29.53" (460 mm x 750 mm)
Bulk Density	70 lb/ft³ (1.12 g/cc)
Chlorine (Cl)	0.23 ppm
Calcium (Ca)	0.17 ppm
Sulfur (S)	1.15 ppm
Sodium (Na)	0.08 ppm
Aluminum (Al)	0.06 ppm
Phosphorous (P)	0.19 ppm
Iron (Fe)	0.15 ppm
Zinc (Zn)	<0.05 ppm

(Typical Properties continued on next page)

## Typical Properties\* (cont)

Characteristic	Typical Value
Potassium (K)	0.02 ppm
Magnesium (Mg)	0.01 ppm
Cobalt	<0.05 ppm
Chromium (Cr)	<0.10 ppm
Boron (B)	0.02 ppm
Copper (Cu)	<0.05 ppm
Nickel (Ni)	0.01 ppm
Arsenic (As)	<0.01 ppm
Silicon (Si)	1.15 ppm
Manganese (Mn)	<0.010 ppm
Mercury (Hg)	<0.5 ppm
Tantalum (Ta)	< 5 ppm
Bromine (Br)	<0.1 ppm
Selenium (Se)	<0.1 ppm
Germanium (Ge)	<0.1 ppm
Titanium (Ti)	0.05 ppm
Lithium (Li)	<0.05 ppm
Total Impurities	3.4 ppm
Certification	Certify to Grade

Notes:

\* Properties listed are typical and cannot be used as accept/reject specifications.

+1 (800) 253-8003 (Toll-Free in USA)  
+1 (216) 529-3777 (International)

www.graftech.com | www.grafoil.com  
grafoil@graftech.com

**Redefining limits**

© 2016 GrafTech International Holdings Inc. This information is based on data believed to be reliable but GrafTech makes no warranties, express or implied, as to its accuracy and assumes no liability arising out of its use. The data listed falls within the normal range of product properties but should not be used to establish specification limits or used alone as the basis of design. GrafTech's liability to purchasers is expressly limited to the terms and conditions of sale. GRAFOIL, EXPANDOGRAF, GRAFKOTE, GTS, and RIBBON-PACK are registered trademarks of GrafTech International Holdings Inc. GRAFOIL flexible graphite materials, and processes are covered by several US patents. For patent information visit [www.grafoil.com/patents](http://www.grafoil.com/patents).

5.10.2016