

# HGR<sup>®</sup> for Mercury Removal

## Granular Activated Carbon



### Description

Calgon Carbon HGR<sup>®</sup> granular activated carbon is a sulfur impregnated carbon. The base carbon is made from select grades of bituminous coal and suitable binders to create the unique pore structure and superior hardness necessary for the intended service. Activation is controlled to impart a pore structure that will both accept substantial quantities of impregnant and maintain access for the gas being treated to the complex pore structure. After activation, the sulfur is distributed in a thin layer over the extensive internal surface area of the carbon. This provides it with the unique properties required for the removal of elemental and organic mercury from natural gas, air, and by-product hydrogen streams.

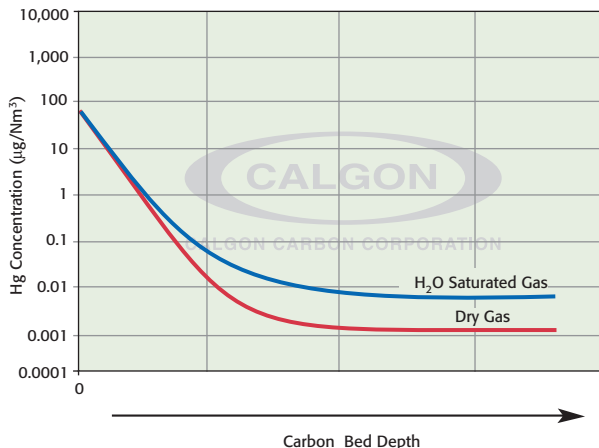
### The Mercury Removal Process

Mercury removal with HGR<sup>®</sup> activated carbon is an established process for removal of mercury from natural gas and by-product hydrogen streams. The mercury is removed from natural gas feedstocks to LNG and LPG plants to protect aluminum heat exchangers from corrosion. The exhaust air from mercury cell chlorine plants or metallurgical processing equipment can be treated to provide an environmentally safe atmosphere for employees and delicate instruments. Type HGR<sup>®</sup> is also used in mercury cell chloralkali plants to remove mercury from by-product hydrogen streams.

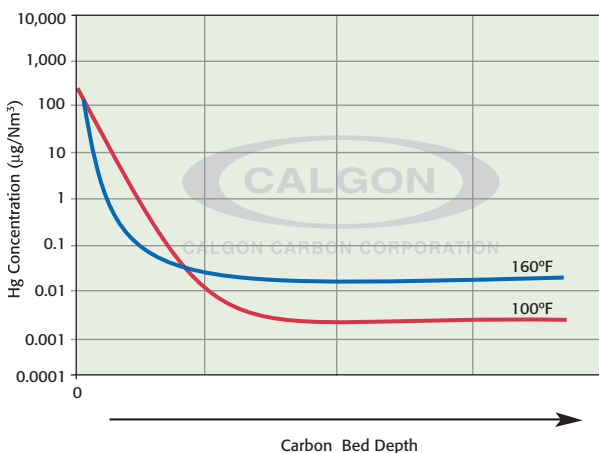
The mercury removal process employs a single or dual vessel adsorption system designed to reduce concentrations to  $<0.01 \mu\text{g}/\text{Nm}^3$  in the treated gas. During the adsorption process, mercury is attracted to the activated carbon surface where a chemical reaction converts the mercury to mercuric sulfide. The sulfide product is then retained in the pores of the carbon granule. Mercury capacity of Type HGR<sup>®</sup> activated carbon can be as high as 20% by weight.

In a properly designed HGR<sup>®</sup> carbon system, the maximum attainable mercury concentration in treated gas is not affected by changing the pressure or inlet mercury concentration of the gas. However, lowering the gas temperature or moisture content of the inlet gas will improve the process and further reduce the mercury concentration in the treated gas. For instance, a gas stream at 150°F saturated with moisture will result in a treated gas containing  $0.1 \mu\text{g}/\text{Nm}^3$  of mercury. The mercury level in the treated gas can be further reduced to  $<0.01 \mu\text{g}/\text{Nm}^3$  by reducing the temperature to 70°F and the moisture to trace levels.

### Impact of Moisture



### Impact of Temperature



### Specifications

Apparent Density	37 lb./ft <sup>3</sup> (approx.)
Sulfur Content by weight	10% (min)
Screen Size by weight, U.S. Sieve Series	
On 4 mesh	5.0% (max)
Through 10 mesh	5.0% (max)

# HGR<sup>®</sup> for Mercury Removal Granular Activated Carbon



## Packaging

225 lb. (55 gal.) steel drum, net wt.

## Safety Message

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed, including all applicable Federal and State requirements.

## Limitations of Liability

The Supplier's liability and the Purchaser's exclusive remedy for any cause of action arising out of this transaction, including, but not limited to, breach of warranty, negligence and/or indemnification, is expressly limited to a maximum of the purchase price of spare parts or equipment sold hereunder. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. In no event shall the Supplier, for any reason or pursuant to any provision of the warranty, be liable for incidental or consequential damages or damages in excess of the purchase price, nor shall the Supplier be liable for loss of profits or fines imposed by governmental agencies.



CALGON CARBON CORPORATION

Calgon Carbon Corporation  
P.O. Box 717  
Pittsburgh, PA USA 15230-0717  
1-800-422-7266  
Tel: 412-787-6700  
Fx: 412-787-6713

Making Water and Air Safer and Cleaner

Chemviron Carbon  
European Operations of  
Calgon Carbon Corporation  
Zoning Industriel C de Feluy  
B-7181 Feluy, Belgium  
Tel: + 32 (0) 64 51 18 11  
Fx: + 32 (0) 64 54 15 91

Calgon Carbon Asia  
65 Chulia Street  
#37-03 OCBC Centre  
Singapore 049513  
Tel: +65 6 221 3500  
Fx: +65 6 221 3554

## Your local representative