

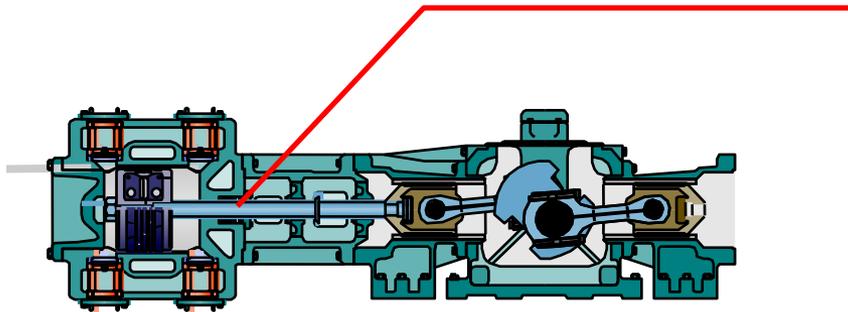
# Motivation – The Need For New Designs

Green House Gas Emissions Are Becoming More And More Noticeable In Both The Public And Governmental Focus

- Reciprocating Compressors In The Natural Gas Business Are Among Major CH<sub>4</sub> Emitters!

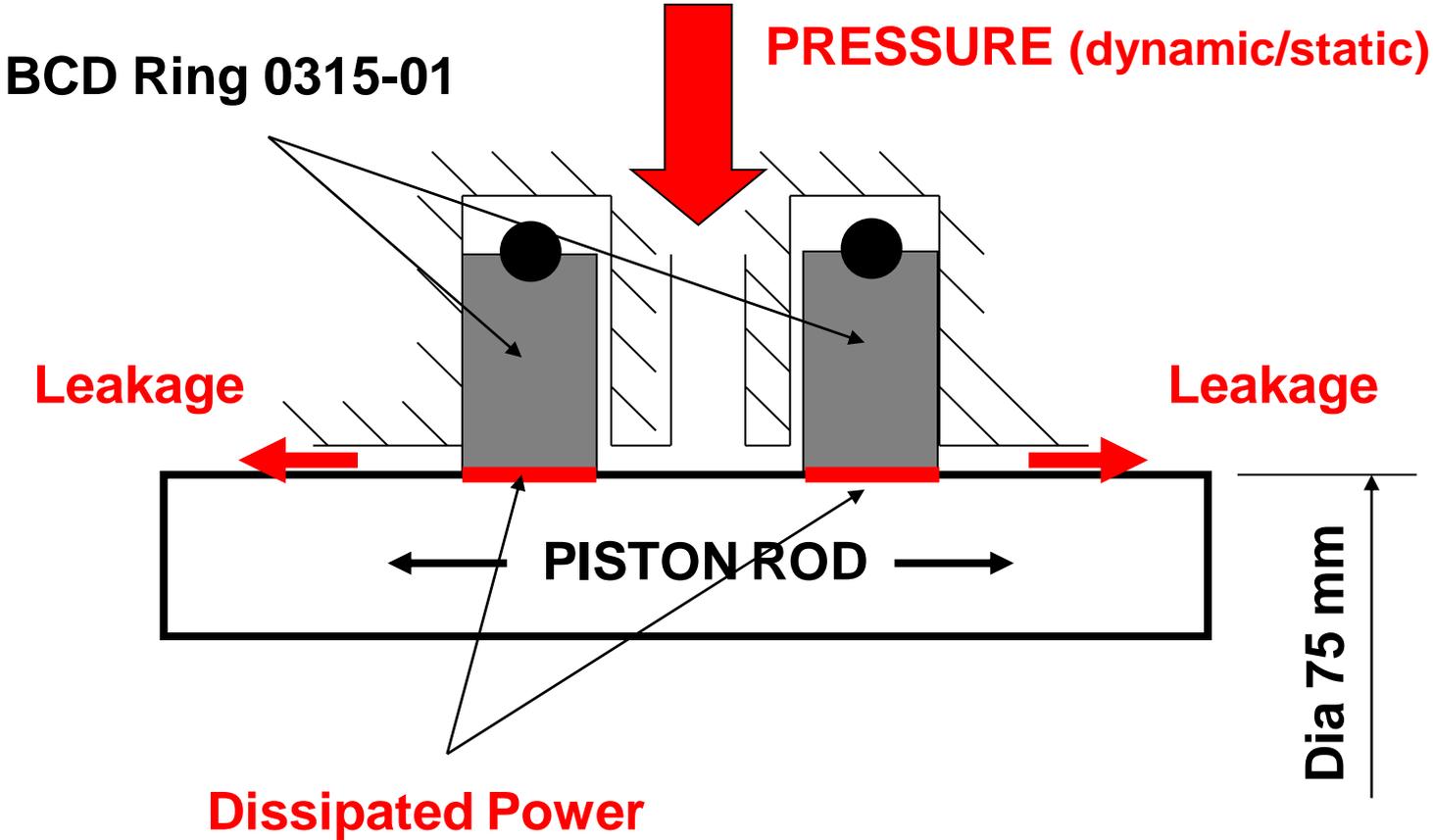
1 ton CH<sub>4</sub> ~ 21 tons CO<sub>2</sub> !!

~34% Of Reciprocating Fugitive Emissions Are Caused By Compressor Seals, The “Chronic Leakers” – The Rod Packing!



# Customers Prove It

THOMASSEN  
COMPRESSION  
SYSTEMS



*Longer Life Time, Lower Rod Temperatures*

# Hoerbiger BCD Packing

## T BCD

- *The New Balanced Cap Design Outperforms Existing Ring Designs Such As The Radial/Tangent Ring Design Which Is The Industry Standard. The BCD Ring Offers Best Performance:*
- *Careful Design And Pressure Balancing Guarantees High Sealing Efficiency Over The Entire Lifetime*
- *Balanced Cap Design Combines High Lifetime And Low Leakage*
- *Seals During Static And Dynamic State*
- *Slim Design Reduces The Contact Area Providing Significantly Lower Rod Temperatures*
- *Robust One Ring Design Consists Of Four Pieces, No Peg Required*
- *New Compressors Benefit From Shorter Packing Length*
- *Easy Retrofit Of Existing Packing By Using Spacer Rings*

## Balanced Cap Design



  
**HOERBIGER**

*Extended Life-50-800%*

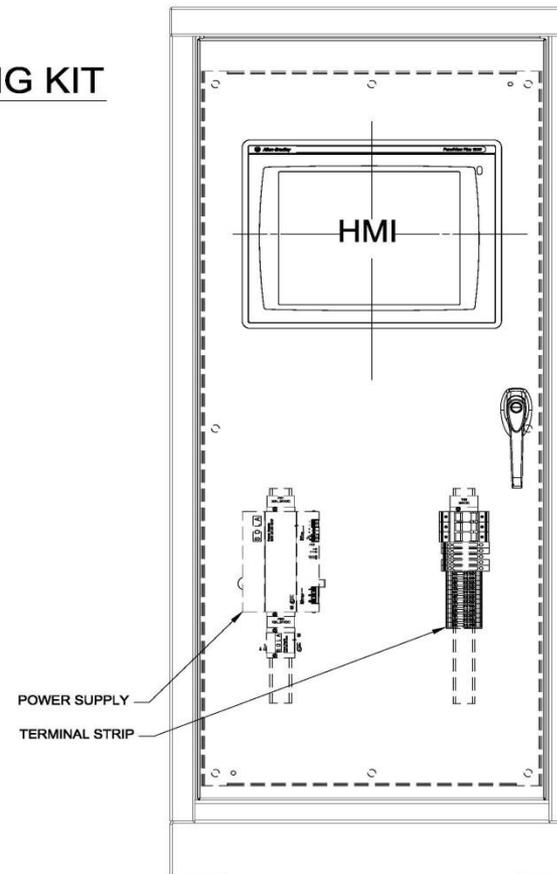
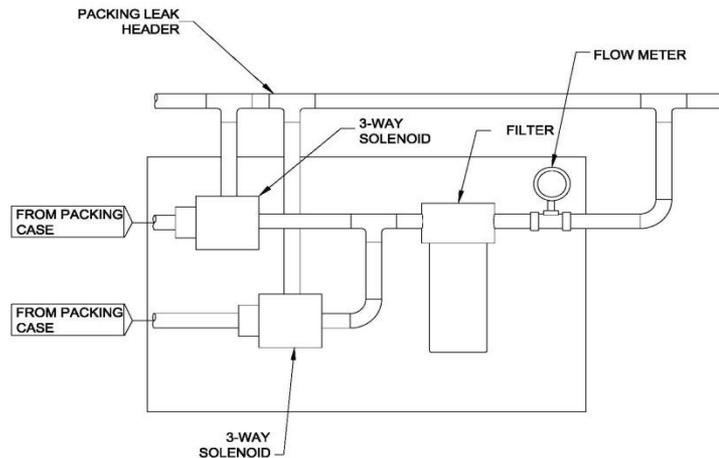
# Basic Rod Packing Monitoring

† **Not Only Do We Need To Reduce GHG Emission**

† **But Most Importantly**

- **How Do We Prove We Reduced Emissions**
- **What Steps Do We Take To Prove We Are Being Pro Active**

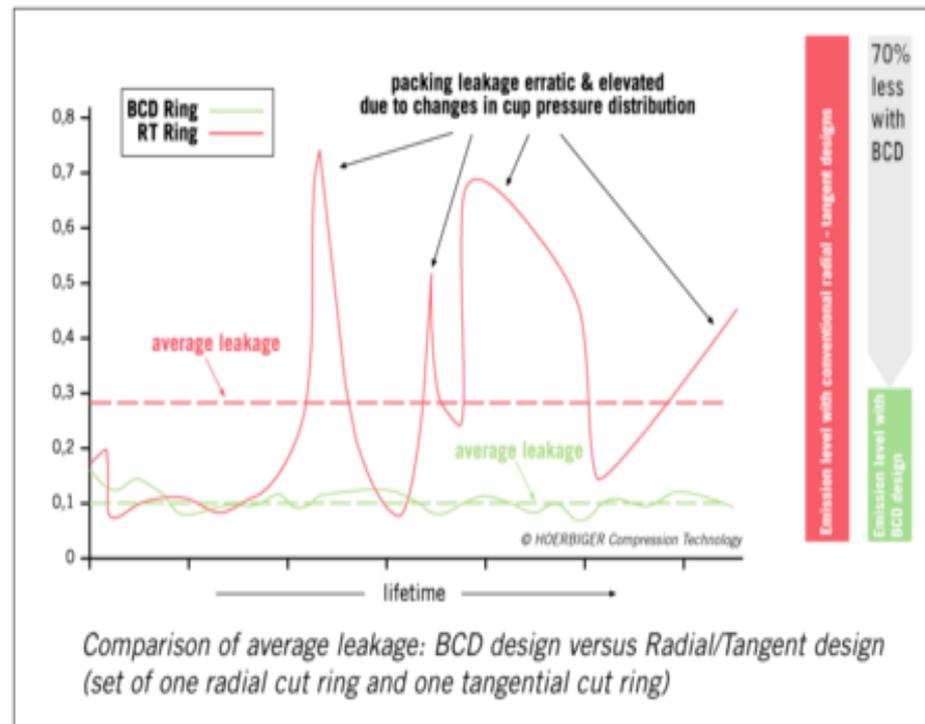
## ROD PACKING MONITORING KIT



# Rod Packing Monitor Kit

## T Benefits

- Customer Have The Ability To Monitor Leaks For Future GHG Emission Credits
- Allows The Customer To Decide When It Makes Economical Sense To Change The Packing
- HES Will Work With The Customer Determine Sample Rate And How Long To Cycle The Solenoids
- Gives Customer Temperature Data
- The Flow Meter Skid Will Only Be About Three Feet By Three Feet, And The Electrical Box Will Be About Three Feet By Four Feet
- With A Mag Pick Up And A Load Input We Can Test In Any State



  
**HOERBIGER**

*Let Us Prove to You It Is Better*

# Why Use Our System

## T Why The Hoerbiger GHG Monitor

- **Hoerbiger Has Taking Monitoring A Step Further**
  - *By Tying The Monitor Into The Customer Automation, It Can Be Viewed And Utilized*
  - *With Other Systems You Will Be Cleaning Every 2-3 Months Which Is Why We Limit The Gas From Flowing Through The Monitor Constantly*
  - *This Is **NOT** A Glorified Magnehelic Gauge*
  - *Once You Have It Electronically It Does Not Cost Any Additional Money To Help Operations Predict The Mean Time Between Changes*
  - *We Can Measure In Any State Which Can Eliminate the Need For several Call Outs For Testing If the Unit Cannot come Down*
  - *Safety Can Be Improved*
  - *Help Quantify Loss and unaccounted for Gas*



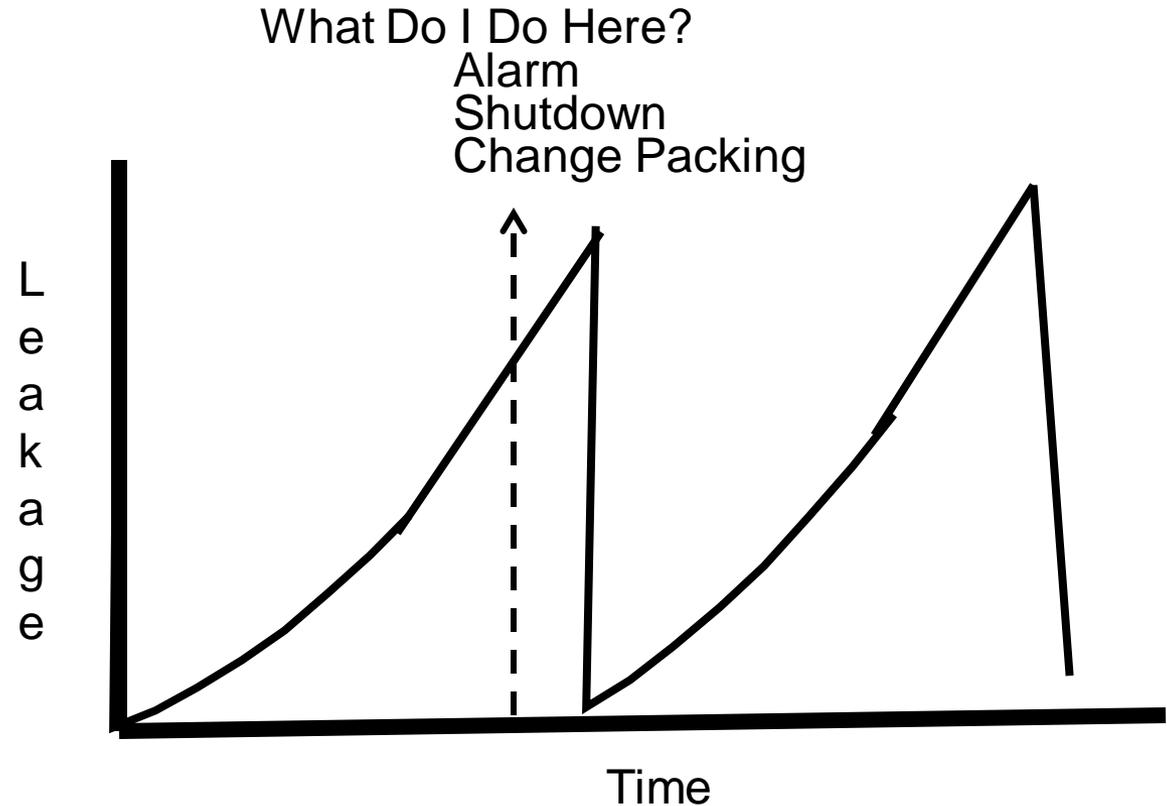
  
**HOERBIGER**

*It Is The Only Complete System*

# Data Usage

## T Data

- *Trending*
- *Replacement Intervals*
- *Mean Time Between Failures*
- *Predict Down Time*
- *Economic indicators*



Trend Leaks So You Can Replace Packing Before It Leaks To Atmosphere



*Customized To Do What You Want To Do*

# Path Forward

## **T Partnership With El Paso**

- **Identify A Sight To Do An Experiment**
  - **Evaluate Several BCD Packing To Determine What Works The Best For El Paso**
  - **Use The GHG Monitor To Monitor All Brand Of Packing In The Trial**
  - **Experiment With The GHG Monitor To Determine If This Is The Answer To Future GHG Monitoring**



***What Is The Next Step?***