Production Packers
What Do Packers Do?

- Packers isolate zones by packing off between the inside of the casing, or open hole, and outside the tubing.

- Closing off the space between the casing and tubing (annulus space) directs oil & gas up to the surface through the tubing as opposed to the dead annulus space.

- The pack off is accomplished by two systems basic to most packer designs, the elements and slips.

- Typical uses: Production Control, Testing, Stimulation, Workover, Safety.
Packer Components

- **Mandrel**
  - Allows flow through the tool, all other components are built around it

- **Elements**
  - Forms the seal between the mandrel and casing wall or open hole

- **Slips**
  - “Bite” into the casing wall, prevent packer from moving when a differential pressure exists

- **Wedges**
  - Forces the slips to move outward and “bite” during setting sequence
Technology Portfolio

- **Permanent Production Packers**
  - Perma-Series® & Perma-Series® HPHT
  - PPH

- **Retrievable Production Packers**
  - Versa-Set®
  - Perma-Lach® PLS
  - Guiberson® G-6
  - Versa-Trieve®
  - Perma-Lach® PHL
  - Guiberson® G-77
  - BHR
  - RH
  - RDH / RHD
  - BHD
  - ESP
  - X-Trieve™ HR
    - AHR / MFA / MFR
  - X-Trieve HC
    - AHC / HHC / DHC / MFC
  - X-Trieve HP
    - HPH / HPS / HHH / MFT
  - HF-1 / HP-1
Technology Portfolio - Preferred Offerings

- **Permanent Production Packers**
  - Perma-Series® & Perma-Series® HPHT
  - PPH

- **Retrievable Production Packers**
  - Versa-Set®
  - Perma-Lach® PLS
  - Guiberson® G-6
  - Versa-Trieve®
  - Perma-Lach® PHL
  - Guiberson® G-77
  - BHR
  - RH
  - RDH / RHD
  - BHD
  - ESP
  - X-Trieve™ HR
    - AHR / MFA / MFR
  - X-Trieve HC
    - AHC / HHC / DHC / MFC
  - X-Trieve HP
    - HPH / HPS / HHH / MFT
  - HF-1 / HP-1
Complete family of permanent production packers

- Within the portfolio there is a standard and HPHT setup
- Utilized across the industry including Deepwater, Unconventional and Mature fields
- Validated for API / ISO V0 and V3 applications

Features

- Slips:  - Opposing C-ring slips (Standard)
  - Opposing barrel slips (HP/HT)
- Elements:  - Multi-durometer with backup shoes (Standard)
  - Multi-durometer with Teflon, wire mesh, and backup shoes, (HPHT)
  (Nitrile, HNBR, Aflas, Flourel)

Design Options

- Wireline-Set: Multiple head and bottom sub variations
- Hydraulic-Set: Multiple head and bottom sub variations
- Hydrostatic-Set: Multiple head and bottom sub variations
Perma-Series® Permanent Production Packers

Wireline-Set

Hydraulic-Set

Hydrostatic-Set

HP/HT
Perma-Series® Permanent Production Packers – Elements & Slips – HPHT vs Standard

Standard Perma-Series® Packer

HPHT Perma-Series® Packer

- Triple Element Package
- Back Up Shoes
- Teflon and Wire Mesh
- Standard Slip Vs Barrel Slip
Versa-Set® Retrievable Production Packers

Standard high volume platform for retrievable W/L and mechanical set packer completions

- Product line offers versatility in the ability to create a wireline or tubing set solution
- Utilized mainly in high volume mature and unconventional fields
- Validated for API / ISO V3 applications

Features

- Slips: Opposing Segmented Slips
- Elements: 3 Piece HNBR with Garter Spring Backups
- Ratings: Up to 10,000 psi and 325°F

Design Options

- Wireline-Set, Tubing Unset
- Tubing-Set, Tubing Unset (With and Without Clutch)
Versa-Set® Retrievable Production Packers

Base Versa-Set Packer

Tubing-Set w/ Clutch Module

Tubing-Set Module

Wireline-Set Module

On/Off tool gudgeon attached to top of Versa-Set packer
Sealbore retrievable production packer set with either a hydraulic setting tool or a wireline setting tool and retrieved via a shift to release operation.

Many times used in sand control solutions as the upper anchoring device. Considered part of Sand Control Tools sub PSL.

Validated for API / ISO V0 and V3 applications.

**Features**

- **Slips:** Barrel slip
- **Elements:** Multi-durometer with backup shoes
- **Ratings:** Up to 15,000 psi
- **Torque through capabilities**
Versa-Latch® Top Sub: Positive latch for tubing connection

Sealbore to receive seal units

Shifting profile to release packer
Versa-Trieve® Retrievable Production Packers

Shown in Set Position

Elements & slips shown engaged with the casing ID providing isolation and anchoring
Hydraulic-set retrievable production packer with straight shear release

- Start to set and release values are field adjustable
- Cost effective platform for single or multi-packer completion solutions

Features

- Slips: Opposing segmented slips
- Elements: Multi-durometer with garter spring backups
- Ratings: Up to 7,500 psi and 325°F
Perma-Lach® PHL Retrievable Production Packers
X-Trieve™ Retrievable Production Packers

The neXt generation of retrievable production packers

- Family is split into three solution profiles utilizing existing platforms that have been updated to the latest standards
- Common technology within this portfolio is the barrel slip which provides the best anchoring and load distribution capabilities
- Validated for API / ISO V0 and V3 applications
X-Trieve™ Retrievable Production Packers

- **Features**

  - **X-Trieve™ HR Packer (AHR, MFA, MFR)**
    - Barrel Slip Above Garter Spring Element
    - Pressure ratings up to 5,000 psi
    - Setting Options: Hydraulic-Set,
    - Retrieving Options: Cut To Release or Straight Shear
    - Other Options: Feed-Through

  - **X-Trieve™ HP Packer (HPH, HPS, HHH, HHS, MFT)**
    - Propped Element Above Barrel Slip, Anti-Preset, Anti-Reset
    - Pressure Ratings Up To 15,000 psi (Potential F/ 20K psi)
    - Setting Options: Hydraulic & Hydrostatic
    - Retrieving Option: Shift-To-Release & Cut To Release
    - Other Options: Feed-Through

  - **X-Trieve™ HC Packer (AHC, HHC, MFC, DHC)**
    - Barrel slip above propped element
    - Pressure ratings up to 12,500 psi
    - Setting options: hydraulic & hydrostatic
    - Retrieving Option: cut to release
    - Other Options: dual bore & feed-through
**X-Trieve™ Retrievable Production Packers**

### X-Trieve™ HR Packer Family

- **AHR:** Hydraulic-set with cut-to-release and straight shear release options

- **MFA:** Hydraulic-set with cut-to-release and straight shear release options and multi feed-through cable bypass capabilities

- **MFR:** Hydraulic-set with straight shear release and multi feed-through cable bypass capabilities
X-Trieve™ Retrievable Production Packers

X-Trieve™ HR Packer Family

Barrel slip for high loads

Field interchangeability and adjustability between shear release and cut-to-release
X-Trieve™ Retrievable Production Packers

X-Trieve™ HR Packer Family – Operational Positions

- **Initial RIH**
- **Set**
- **Straight Pull Release**
- **Mandrel Cut Release**
X-Trieve™ Retrievable Production Packers

X-Trieve HC Packer Family

- **AHC**: Hydraulic-set and cut-to-release
- **HHC**: Hydrostatic-set with hydraulic set contingency and cut-to-release
- **MFC**: Hydraulic-set and cut-to-release and multi feed-through cable bypass capabilities
- **DHC**: Hydraulic-set and cut-to-release and dual bore / multi feed-through cable bypass capabilities
X-Trieve™ Retrievable Production Packers

X-Trieve™ HC Packer Family  (AHC, HHC, MFC, DHC)

Barrel slip for high loads & propped element for superior sealing
X-Trieve™ Retrievable Production Packers

X-Trieve™ HC Packer Family – Operational Positions

Run

Hydraulic-Set

Hydrostatic-Set

Cut and Release
X-Trieve™ Retrievable Production Packers

- X-Trieve™ HP Packer
  - **HPH**: Hydraulic-set and shift-to-release
  - **HPS**: Hydraulic-set and cut-to-release
  - **HHH**: Hydrostatic-set with hydraulic-set contingency and shift-to release
  - **HHS**: Hydrostatic-set with hydraulic-set contingency and cut-to release
  - **MFT**: Hydraulic-set and cut-to-release and multi feed-through cable bypass capabilities
X-Trieve™ Retrievable Production Packers

X-Trieve™ HP Packer Family

Propped element for superior sealing

Barrel slip optimizes anchoring and load distribution
X-Trieve™ Retrievable Production Packers

X-Trieve™ HP Packer Family

Anti-Preset Feature

Anti-Reset Feature

Start to Release

Release
X-Trieve™ Retrievable Production Packers

X-Trieve™ HP Packer Family – Operational Positions

Run

Set

Cut-to-Release
Why Halliburton?

- **Best high-performance production packers in the industry**
  - Hydrostatic setting module design
  - Propped element critical sealing technology for X-Trieve packer systems
  - HPHT element package for Perma-Series packer systems
  - Barrel slip for high anchoring and load distribution

- **Best engineered product development team**
  - Experienced personnel focused on providing the right solution
  - Capable of high degree of customization and collaboration
  - High end test facilities to validate the product

- **Global supply chain for high performance products**
  - The best lead time on high performance packers requires efficient execution of complete supply chain process (material sourcing, quality plans, outsourcing, machining capabilities, etc...)
SPE 130540 & SPE 132176

An Innovative back-up system for a 9-7/8-in. HP/HT permanent packer

Provides a solution for damaged or worn casing in the North Sea
Who to Contact, Where to get more information

Rod Falconer
Product Manager – Production Packers & Accessories

Roderick.Falconer@Halliburton.com
Packer.Technology@Halliburton.com

Phone: 972-418-4363
Cell: 214-862-8935