April 2008

Hammerless Union

The Safer Alternative

The hammerless union is the next generation of union products targeted at eliminating the use of sledge hammer in making up high pressure temporary flowline connections in the field. This product was inspired by the desire for improved safety through the elimination of hammer related injuries:

- **Bodily injuries from missing hammer strikes**
- **Flying debris caused by hammer blows**
- **Injuries from hammer slipping out of worker's hands**
- **Danger due to deformed and sharp wing union lugs**

Anticipated applications for the Hammerless union is well service temporary flow lines, with particular attention toward applications in fracturing, stimulation, cementing, and pipeline operations. However, any area in which space is confined or swinging a hammer is dangerous, this product is a probable fit. The Hammerless union is designed to be retro-fitted to existing flow line equipment which greatly reduces the financial impact of switching costs.

This product is offered as an alternative to the wing union and addresses all hammer related problems. It minimizes opportunities for accidents while providing a viable solution that could be quickly and easily implemented. Every detachable wing union connection can be easily upgraded to the new Hammerless connection by merely replacing the existing wing nut with a hammerless nut. No other changes to the existing iron are required!

A guided hammer is engaged with the union nut, and a few efficient "sweet spot" strokes are all that is needed for proper make-up or rig down. This new union and tool are the result of extended collaborative user-manufacturer prototype trials in controlled shop environments and field tests over a two year period. A study and final report from a licensed orthopedic physician confirmed that the risk of "tennis elbow" was significantly reduced with proper use of the tool.

The hammerless union is another "first" by FMC Technologies. **It is the only system available that successfully and practically eliminates the hammer in well service flow line make up operations with little or no adverse effect on productivity.** A patent application has been submitted for the hammerless union, tool, and the combination.

FMC Technologies

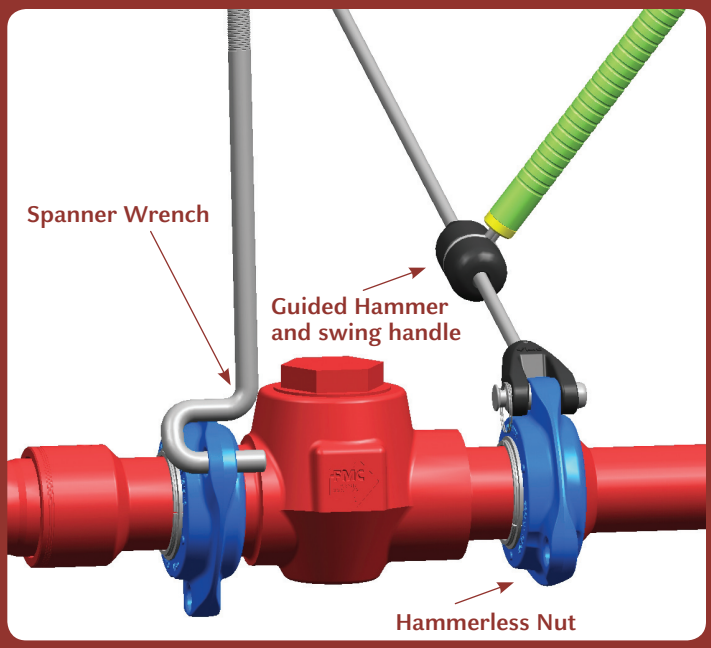
Hammerless Union

The rounded triangular shape of the nut discourages using a hammer.

Operators are required to use the "Tool" instead of sledge hammer to make up the connections. The holes on the nut provide multiple places to connect the Tool on any flowline configuration.

There are two different Tools available: Long and Short Tools. The Long Tool is a two man tool, where one person holds the tool while the other one uses the guided hammer. The Short Tool doesn't have a swing handle and is designed for use at the last connection at the wellhead or other highly constrained workspaces, where only one operator will be able to make up a connection.

The Spanner wrench is available as an optional tool to tighten the Hammerless nut before connecting the Tool or loosening the nut after using the Tool to speed up the rig up and rig down process.



Benefits

- Easy to use and safe around others
- Focus on improved safety
  - Eliminates the use of sledge hammer
  - Eliminates the wing nut ear "mushroom" effect and sharp edges
  - Improves strength
- Cost effective
  - Interchangeable with existing equipment
  - Lasts five times longer than hammer union
- No major change in price
- Low cost of field conversion
- No air or hydraulic lines required
- No major impact to field make-up time
- Fits on current storage rack

Hammerless Nut		Tools		
Size	Weight	Size	Weight	Length
2" 1502 Nut	12 lbs.	Long Tool	20 lbs.	5'7"
3" 1502 Nut	17 lbs.	Short Tool	16 lbs.	3'7"
4" 1002 Nut	21 lbs.	Spanner Tool	6.7 lbs	2'0"

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