

Hot and Warm Forming Increase Efficiency and Productivity with Synthetic Forging Product

QH PRESSMAX FWW 3502

The Challenge

The customer is one of the largest international automotive suppliers in the area of steel and aluminium forging as well as subsequent machining. The customer is serving all renowned automotive manufacturers and suppliers worldwide. Our customer develops and manufactures products in all fields: powertrain, electric drive, injection, chassis and body, transmission and engine. The main objective is to have the state of the art solution with highly optimized cost. In order to fulfil the customer requirements and expectation, Quaker Houghton is always challenged to improve the current fluid in use in Forging process and develop further the process and quality of the parts.

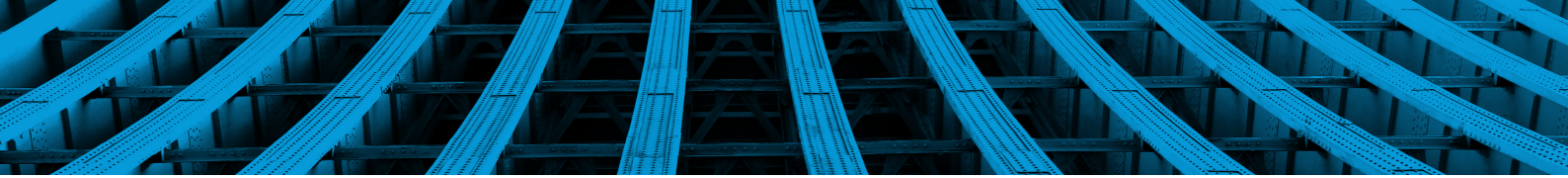
The customer uses both Hot and Warm Forging technology for production of steel forged parts. The processes run on highly automated production lines with rate of production more than 25 parts per minutes. The customer is aimed to use the same lubricant for both processes. After several discussions with the customer, the challenges and the improvement areas for the new lubricant are defined as bellow:

- **Cooling performance:** Since both processes are running on high rate production lines, the temperature and controlling of temperature of the dies is the main issue in process stability. The new lubricant should perform perfect cooling performance and cooling properties.
- **Release and lubricity performance:** In order to have acceptable die life time and increase the part quality, beside superb cooling performance, the new lubricant should exhibit good release and lubricity properties.
- **Cleaning properties:** The next solution should leave near to zero residue on the die surface and be easily removable from the dies and machines, just with warm water. This will increase the efficiency of the line (less cleaning time) and also is in line with EHS.
- **Life time of the lubricant in use:** Since the customer recycle the used lubricant and re-use it, the future lubricant should be adapted to such procedure and have an acceptable bath life time.

The Benefits

After implementation of the product in all production lines and analysing the performance and output of the lines (die life time, production rate, lubricant life time, consumption) and parts quality, the customer and Quaker Houghton team summarized the advantages of using QH PRESSMAX FWW 3502 as follow:

- **Increase of production rate:** Thanks to the superb cooling properties of QH PRESSMAX FWW 3502, the temperature of the die, one of the most important factor of the production, became controllable and the production rate could increase.
- **Extension of die life time:** The overall die life time in extended, since the die wear due to increase of temperature was abandoned. Moreover, Since the lubricity properties and release effect are also improved, the mechanical die wear is also postponed. All these factors resulted the production to became more stable.
- **Outstanding part quality:** Since the process is more stable and the temperature of the dies are more controllable, the forming process became more stable and material flow is more smother. All these factors affect positively on part quality. The number of scrape rate is decreased and the overall performance of the line increased.
- **Cost saving:** All factors discussed before helped our customer to be more effective and to be able to increase the efficiency of the production lines.



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The Solution

The Quaker Houghton team analysed the requirements and working with the customer to understand the processes and limits in production line. The main objective was to meet all customer expectations and select one product suitable for both hot and warm forging operations. The development of a new product, QH PRESSMAX FWW 3502, was started and pushed to its limit. Optimized raw materials and the additives are selected. Several analytical and performance tests are done to analyse the performance of the new lubricant under varying conditions. After several technical discussion and analysing all results with customer, Quaker Houghton team ends up with a final formulation for the next generation of synthetic lubricant for Hot and Warm Forging.

The customer made several trials and analysed the performance under real production condition. QH PRESSMAX FWW 3502 meets all customer expectations and specifications and selected as a standard lubricant for both processes.

The Product

QH PRESSMAX FWW 3502 is a synthetic forging lubricant. It exhibits very superb cooling performance with a good lubricity and was designed and tailored for high production rate under extreme conditions. It is a great candidate for very complex small to medium sized parts.

QH PRESSMAX FWW 3502 increase dies cooling properties without leaving residues on the forging surfaces.

