



WeldComputer

The Technology Leader in Resistance Welding

Case Study



**Ammunition and Firearms
Manufacturer Pulls the Trigger on
WeldView Portable Monitor,
Proves Quality and Eliminates
Destructive Testing**

Ammunition and Firearms Manufacturer Pulls the Trigger on WeldView Portable Monitor, Proves Quality and Eliminates Destructive Testing

THE COMPANY

Founded in 1816, **Remington Arms Company** is one of the oldest manufacturers of firearms and ammunition in America. For over 200 years, Remington has been a trusted source for generations of hunters, and shooters of rifles, handguns and shotguns. With a long history of

innovation and quality at the forefront of their production, Remington is “proud of each and every round that rolls off [the] factory line”¹ and ensures their “customers are buying the very best product available.”² Today, Remington Ammunition and Remington Firearms operate as two separate companies.

THE CHALLENGE

Remington was first introduced to WeldComputer back in 2007. At that time, Remington’s resistance welding manufacturing engineers called WeldComputer to assess the quality of their welding machine. When our engineers arrived on the scene to examine a production line, we hooked up a WeldComputer WeldView Portable Monitor and recorded the production of 123 welds performed on head 1 of a 14-head welder.

The WeldView Portable Monitor recorded weld quality metrics for each weld. The data was then analyzed to establish the upper and lower limit benchmark profile for normal weld production.

The WeldView Portable Monitor performed 720 separate limit checks in real-time to assess quality relative to the benchmark. Notably, the WeldView

Portable Monitor recorded the typical set-down response of each weld in this operation exceeds 200 μm at a point 10 half-cycles after the application of weld heat, such as measured in the chart below – a total set-down of 263 μm and a cooldown of 68 μm that occurred after termination of weld heat (Fig. 1).

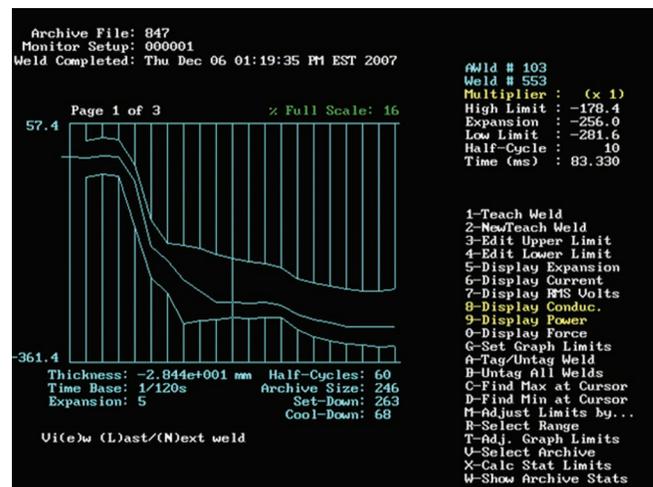


Figure 1. Response of weld immediately before failed weld 105.

¹ <https://www.remington.com/about-us>

² <https://www.remarms.com/about-us>

Without a monitor, the Remington team lacked this level of detail over every weld. They relied on periodic destructive testing to measure weld quality but quickly realized why it is a poor quality assurance method. Unfortunately, destructive testing only measures the quality of the welds that are destroyed, not the ones that are not tested.

As we monitored 123 welds, there were six welds that the WeldView Portable Monitor flagged as undersized. Each failed weld was recorded between two welds created within acceptable limits. This was eye-opening to the Remington team.

Given this, there would be a 95% chance that destructive testing performed on this batch of production welds would not have caught a single bad weld. Only after using a WeldView Portable Monitor did the team discover how they may be letting problem welds slip by undetected.

One of these welds was 105, which measured an inadequate set-down response of only 23 μm at a point 10 half-cycles after the application of weld heat, significantly outside of the established upper and lower limits (Fig. 2). The WeldView Portable Monitor notified us of the out-of-limits condition while the weld was still in progress.



Figure 2. Failed weld 105 showing inadequate set-down response.

Our engineers immediately asked the team to pull the weld and perform destructive testing to validate the weld quality. Testing confirmed it was an undersized weld as reported by the WeldView Portable Monitor.

The weld immediately following this event was also examined. This weld was created with an acceptable set-down response of 257 μm and cooldown after the weld of 74 μm (Fig. 3). The only way the Remington production welding operators would have known if there was a poor weld would be if they had gotten lucky and pulled weld 105.

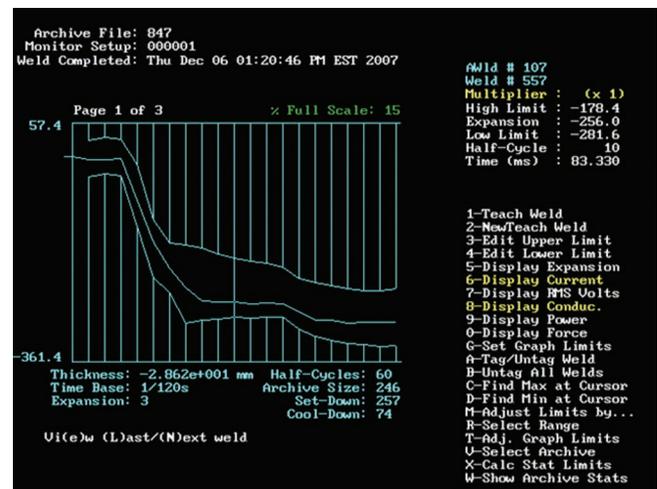


Figure 3. Response of weld immediately after failed weld 105.

THE SOLUTION

The Remington team opted to implement WeldView Portable Monitors across their production operation welding machines to prevent poor welds from passing through production.

MONITOR EACH WELDING PROCESS

As with weld 105, the WeldView Portable Monitor verified production welding parameters and immediately detected an abnormal weld setdown response pattern. This is just one example of how the WeldView Portable Monitor can detect problem welds as they occur.

By continuously monitoring and assessing weld quality, the WeldView Portable Monitor can notify the production operator within milliseconds if the conditions fall outside of limits, so that weld can be pulled from the production line.

ASSURE QUALITY WHILE ELIMINATING DESTRUCTIVE TESTING

It was eye-opening to the Remington team to realize their destructive testing methods were an inadequate way to measure weld quality. They now understood that their testing methods had a 95% chance of not catching a single bad weld in this batch. What's worse is that if they were lucky enough to test one of the 5% of bad welds in this batch, Remington's team would incorrectly apply corrective action and scrap all the welded parts since their last destructive test.

Using a WeldView Portable Monitor, Remington is now able to prevent all problem welds from passing through production undetected, and provide a permanent record of the integrity of every weld created for audit purposes.

REMOVE THE GUESSWORK AND IMPROVE CUSTOMER SATISFACTION

The Remington team is able to quickly assess and verify the weld quality of each weld so that they can avoid shipping products to customers that include sporadic bad welds.

VERIFY PROPER MACHINE PERFORMANCE

The Remington team saves time and money by avoiding unnecessary maintenance procedures and knowing immediately when maintenance is needed.

INCREASE PRODUCTIVITY AND COST SAVINGS

The WeldView Portable Monitor provides comprehensive quality assurance of every weld while having no impact on production throughput. Because downtime and scrap material were not spent on destructive testing, the company could eliminate excessive costs.

