

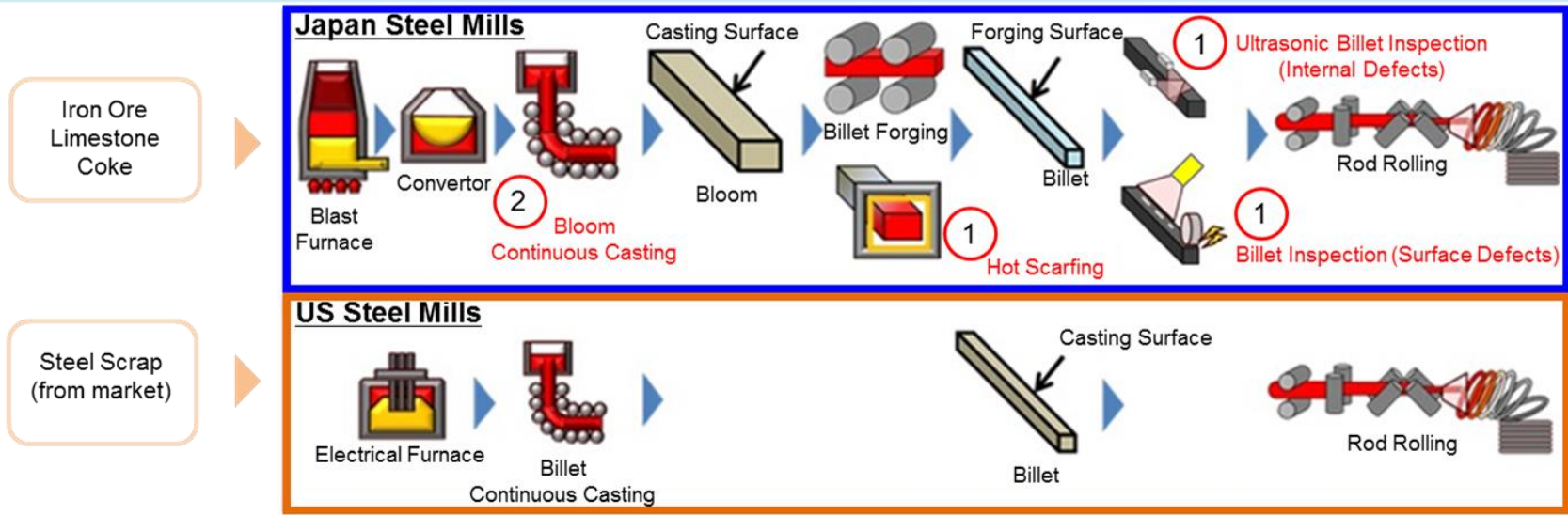
# Our Requirements for Cold Heading Quality Wire for Automotive Fasteners

## 1. Requirements

In the case of automotive fasteners, there is the possibility that even one faulty piece could result in a critical failure in the vehicle's ability to run, turn, or stop. Therefore, regarding bolt quality, our company specifically demands the following two requirements in our raw material to prevent bolt failure during vehicle operation in the market: no harmful inclusions or surface defects.

- 1 Surface and Internal Defect Inspection of Billet (billet inspection and ultrasonic test)  
→full-length inspection for internal defects is conducted on every billet
- 2 Bloom continuous cast and then billet forging  
→reduces number and size of internal inclusions

## 2. General Description: Steel Making Process



## 3. Conclusion

Based on our investigation, there is no US steel wire manufacturer who offers the combination of processes and quantity of product that we require.

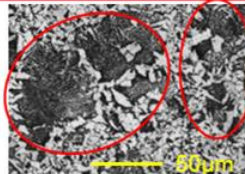
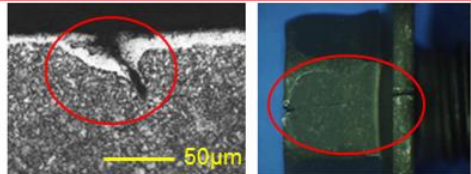
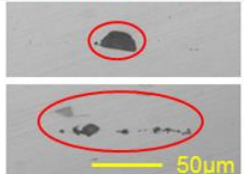
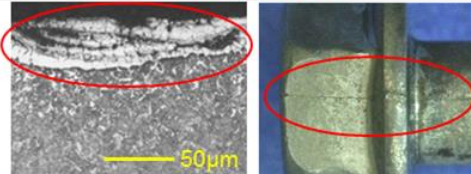
Evaluation: Process and Product

		Process Characteristics						Product Characteristics			
Country	Mill	Melting	Degassing	Casting	Hot Scarfing	Surface Inspection	Internal Inspection	Surface Defects	Internal Inclusions	Chemical Composition	Micro Structure
Japan	Maker:A	Blast Furnace + Converter	Ladle Furnace + Ruhrstahl-Heraeus	Bloom	Utilized	Magnaflux Test	Ultrasonic Test	None	None	Satisfactory	Satisfactory
			○	○	○	○	○	○	○	○	○
	Maker:B	Blast Furnace + Converter	Ladle Furnace + Ruhrstahl-Heraeus	Bloom	Utilized	Magnaflux Test	Ultrasonic Test	None	None	Satisfactory	Satisfactory
			○	○	○	○	○	○	○	○	○
USA	Major Mills	Electric Furnace	Ladle Furnace + Vacuum Degassing	Billet	None	None	None	Present	Present	Satisfactory	Unsatisfactory
			△	×	×	×	×	×	×	○	×

If there is even one "X", the material is not acceptable for our process.

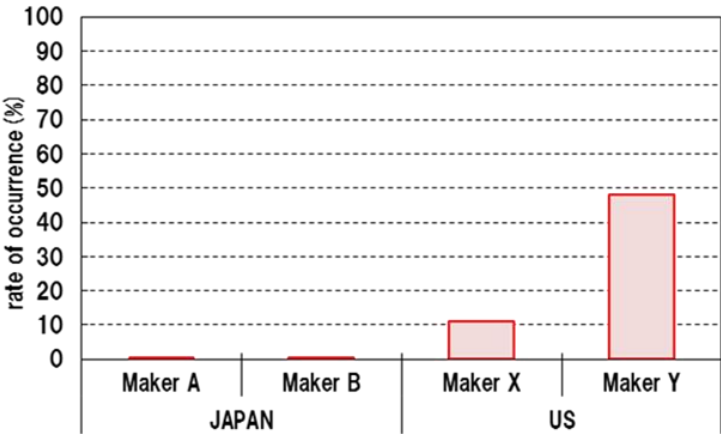
Our process is based on the precondition that the raw material will be defect free. There is no US steel wire manufacturer who possesses the manufacturing processes, capacity, and quality level our company requires to produce reliable automotive fasteners that will not compromise a vehicle’s ability to run, turn, or stop.

## Evaluation: Trial Results of US-made Steel Wire

Steel Maker	Steel Grade	Internal Inclusions Segregations	Bolt Surface Defects
US Steel Mill : X	SAE10B23	 Segregations	 Surface Defects
US Steel Mill : Y	SAE10B23	 Inclusions	 Surface Defects

Results of our trial using US raw material:

- High frequency of inclusions detected
- High occurrence of surface defects



Rate of Occurrence: Surface Defects

Based on these findings, US-made wire does not meet our quality requirements.  
Japanese steel is necessary in order to ensure reliable fastener manufacturing in our process.

Attachment to O&k American's Request For Exclusion from Remedies:  
Section 232 National Security Investigation of Steel Imports

Dated: 04/17/2018

Thank you for the opportunity to present our Request For Exclusion from Remedies: Section 232 National Security Investigation of Steel Imports. This attachment will explain in detail why we believe our requested Japanese BOF / Bloom Cast products should be excluded.

The reason for this exclusion request is the quality of products secured from our Japanese supplier. This steel is used as a core component to the high quality safety critical automotive industry. Parts that are produced from this steel include: engine fasteners, ball studs, seat restraint fasteners, brake caliper pins, etc. A secondary reason for our exclusion request is the Qualification Timeline required for approving a new material source within this supply chain.

This is the second batch of exclusion requests submitted by O&k American. Our first batch was submitted the week of March 26<sup>th</sup>. This exclusion follows under the same request as our previous batch: The quality of the Japanese BOF/Bloom Cast product exceeds what is available in the North American EAF and/or Billet Cast production. Based on the required high quality steel, our customers are able to meet the strict safety, quality and cost demands of the automotive marketplace. This exclusion request is based hot rolled wire rod that is being imported for O&k to manufacturer on behalf of our Supply Chain.

If there are any questions regarding the information contained here, please do not hesitate to contact: Mr. Chris White, O&k American, telephone: 773 757 2002 or email [cwhite@oandkamerican.com](mailto:cwhite@oandkamerican.com).



To define my exclusion request for Japanese BOF/Bloom Cast materials, I will present the following:

- 1. The Requirements Needed For Safety Critical Automotive Components
- 2. Performance Of The Japanese BOF/Bloom Cast Materials Versus North American EAF and/or Billet Cast Materials
- 3. Qualification And Approval Timeline For New Materials For Safety Critical Components
- 4. Conclusion

The Requirements Needed For Safety Critical Automotive Components.

The automotive industry has deemed various parts within the vehicle as safety critical. The reason for this designation is to allow the entire supply chain to understand the importance of these parts. Normally if something happens to these parts they can cause a safety concern for the operators of the vehicle.

The parts are high quality but also need to be made in high volume. This is where the process of cold forming has proven to be the best solution. For a review of the cold forming process, please see:

• How Cold Forming Works:

<http://todaysmachiningworld.com/magazine/how-it-works-cold-forming-makes-fasteners-and-a-lot-more/>

• Advantages Of Cold Forming:

<http://www.nationalmachinery.com/cold-forming-principals/cold-forming-benefits>

[http://www.deringerney.com/products-and-capabilities/cold-forming/?gclid=EALaIQobChMxJ2k\\_ceA2gIVQrj8Ch2gGwrcEAAAYASAAEgIKVvD\\_BwE](http://www.deringerney.com/products-and-capabilities/cold-forming/?gclid=EALaIQobChMxJ2k_ceA2gIVQrj8Ch2gGwrcEAAAYASAAEgIKVvD_BwE)

As these articles detail, the main reason for using the cold forming process is the high production output. This places a major challenge on our customer as they have to assure the quality level of this high volume production. To do this they have determined that it more economical and advantageous to secure a higher quality steel and eliminate the amount of rejections they must find or risk shipping to their customer. This is a key reason again for the need for Japanese BOF/Bloom Cast material. This is why I am asking that our Japanese BOF/Bloom Cast material be excluded.

Now that you understand the process of manufacturing, I would like to provide information on safety critical parts. This is best reviewed by the following:

• **Safety Critical Automotive Needs & Parts :**

[https://www.astm.org/ABOUT/images/AutomotiveSector\\_Overview.pdf](https://www.astm.org/ABOUT/images/AutomotiveSector_Overview.pdf)

<https://www.esict.com/blog/manufacturing-car-safety-components>

These articles reference the demands of the applications that our material is consumed in. Our supply chain must meet the demands of the automotive market. This includes the implementation of quality systems including TS 16949 and IATF 16949. Our customers have determined that the best way to provide the consistent product the automotive suppliers demand is utilizing the Japanese BOF/Bloom Cast materials. This conclusion is documented in the quality performance outlined below.

Performance Of The Japanese BOF/Bloom Cast Materials Versus North American EAF and/or Billet Cast Materials

The following table outlines the claim weights we have secured from our customers in 2016/17 based on steel related rejects. The performance that Japanese BOF/Bloom Cast material has shown is the reason our customer requires this material in their process. For a review of these results, please see Table 1:

**Table# 1**

Year	Japanese BOF/Bloom Performance			EAF And/Or Billet Performance			% Of Rejects From	
	Volume Secured In Short Tons	Volume Confirmed Rejected For Steel Related Claims	% Of Rejection From Steel Related Claims	Volume Secured In Short Tons	Volume Confirmed Rejected For Steel Related Claims	% Of Rejection From Steel Related Claims	BOF/Bloom	EAF And/Or Billet
2016	79,669	0.00	0.000%	24,995	58.37	0.234%	0.000%	100.000%
2017	72,965	1.15	0.002%	22,347	23.79	0.106%	4.603%	95.397%
2016 & 2017	152,634	1.15	0.001%	47,342	82.17	0.174%	1.378%	98.622%

This table details O&k’s volume of products secured from our two main and available steel producing sources

- Japanese Suppliers = BOF and Bloom Cast
- Non Tariffed, USA and North American Suppliers = EAF and/or Billet Cast

As shown, the two processes yield dramatic differences with respect to performance. Our Japanese BOF/Bloom has yielded a .001% rejection rate and 1.378 % of our total claims compared to EAF and/or Billet Cast at .174% rejection rate and 98.622% of our customer rejections. This is further impressive as our Japanese BOF/Bloom Cast material was consumed more than 3.22 times then our non-tariffed, USA and North American EAF and/or Billet Cast tonnage.

To further show this quality difference, Table #2 shows an example of the potential for defective parts based on a sample part weight. For calculation sake, I used an M10 – 30MM part. Customer parts vary in size and weight.

Table# 2

Estimated Calculation In Piece Count (Assume M10 - 30MM Length = .086lbs/piece)								
Year	Japanese BOF/Bloom Performance			EAF And/Or Billet Performance			% Of Rejects From	
	# Of Parts Produced	# Of Parts From Steel Related Defect	% Of Parts Rejected	# Of Parts Produced	# Of Parts From Steel Related Defect	% Of Parts Rejected	BOF/Bloom	EAF And/Or Billet
2016	1,790,314,607	0	0.000%	561,685,393	1,311,753	0.234%	0.000%	100.000%
2017	1,639,662,921	25,798	0.002%	502,179,775	534,674	0.106%	4.603%	95.397%
2016 & 2017	3,429,977,528	25,798	0.001%	1,063,865,169	1,846,427	0.174%	1.378%	98.622%

Table #2 documents the difference in the amount of rejected parts based on the standard part chosen. As shown, the Japanese BOF/Bloom material would yield 25,798 defective parts compared the EAF and/or Billet Cast yield of 1,846,427 defective parts. If we held the

EAF and/or Billet Cast reject rate fixed and multiplied it by the volume from the BOF/Bloom Cast process this EAF and/or Billet Cast defective number would provide 5,968,160 defective parts.

I believe the above comparison shows the performance difference within our customer's process. It is for this reason, I request exclusion approval for the Japanese BOF/ Bloom Cast Product.

Now for the way in which these results are secured, I would like to go back to the beginning. The performance results are justified based on the differences in steelmaking methods and practices utilized. This starts with the terms detailed throughout my submission of BOF, Bloom Cast, EAF and Billet Cast.

As I am not sure of your steel knowledge, I thought it best to let the experts explain. To do this I will provide a recap of these processes via web sites. Please see:

- **Comparison Of BOF and EAF Process**

<http://www.steel.org/steel-technology/how-its-made/steelmaking-flowlines.aspx>

- **Basic Oxygen Furnaces Process - BOF (Also Called BOS In Attached)**

<http://www.steel.org/steel-technology/how-its-made/processes/processes-info/the-basic-oxygen-steelmaking-process.aspx?siteLocation=391fb50d-5dfb-4988-b746-4a6f4d53311a>

- **Electric Arc Furnace Process - EAF**

<http://www.steel.org/steel-technology/how-its-made/processes/processes-info/electric-arc-furnace-steelmaking.aspx?siteLocation=391fb50d-5dfb-4988-b746-4a6f4d53311a>

- **Continuous Casting Overview**

<http://www.steel.org/steel-technology/how-its-made/processes/processes-info/continuous-casting-of-steel---basic-principles.aspx?siteLocation=88e232e1-d52b-4048-9b8a-f687fbd5cddb>



These articles address the differences in the process of manufacturing. The BOF/Bloom Cast has shown that through its improved production process it provides the high quality performance results our customer expect.

Now that you have a better understanding of the steel making and cold heading process, I would like to outline the need for the exclusion requested steel.

O&k's customers manufacture high quality and/or safety critical parts for the automotive industry. The automotive industry is highly automated and demands their suppliers to provide perfect parts every time. Fasteners and other cold formed parts are covered under industry specifications .

• **ASTM Specifications For Fasteners**

<https://www.astm.org/Standards/fastener-standards.html>

In additional to these, most customers have their own internal specifications for the steel products utilized within their fasteners.

Hence to supply the automotive industry, our customers need to meet the criteria of: high quality parts, high volume parts and cost competitive pricing. This has led our customer to the cold forming process. This has further led our customer to use the requested exclusion Japanese BOF/Bloom Cast Steel. This has historically proven to allow them to meet these critical needs and provide the parts required by the automotive industry.

The Japanese BOF/Bloom Steel has the following advantages:

- Improved chemical control and consistently within and between heats.
- Improved internal soundness of the material
- Increased reduction ratio and improved surface quality from intermediate rolling.
- Increased opportunity for inspection processes and quality enhancements based on intermediate rollings.

These attributes are why our customer purchases the Japanese BOF/Bloom Cast. Japanese BOF/Bloom has allowed our customer to successfully make the quality and quantity of parts required by their automotive customer. If they were required to accept the higher level of rejections documented from the EAF and/or Billet Cast process, they would not be near as effective or efficient in their operations. Potentially they may not be able to supply the demands of the automotive customers.

**Qualification And Approval Timeline For New Materials For Safety Critical Components**

Another key consideration in this process is the qualification time required for new vendor materials throughout our supply chain. We have worked with various vendors in the past on this process.

Currently we are working to qualify a North American supplier at a Japanese BOF/Bloom Cast customer. This process started in August, 2017 and the trials of material were shipped to our cold forming customer in March, 2018. Our customer is evaluating these materials now and we will wait until they report the results prior to moving forward in this process. Timeline #1 outlines the typical process for this qualification for a new steel supplier.

Timeline #1

Typical Timeline For Qualification Of New Steel Supplier For Cold Formed Automotive Components								
Month 1	Month 2 - 3	Month 4	Month 5	Month 6 - 7	Month 8	Month 9 - 10	Month 11 - 13	Month 14
Reception Of Processed Rod Or Wire Qualification Plan, Material Requirement And Run Material Specification Clarification, Initial Order Entry To Steel Mill.	Acceptance Of Initial Order By Steel Mill, Steel Mill Production, Testing & Inspection, Material Ready For Shipment To Wire Manufacturer.	Wire Manufacturer Produces Initial Processed Rod Or Wire Order, Internal Testing & Inspection Completed.	Shipment Of Processed Rod Or Wire To Cold Forming Customer For Manufacturing Into Cold Formed Component. Trial Part Manufacturing Completed.	Fastener Manufacturer Testing And Qualification Of Trial Material, Development Of Part Change Submission To Automotive Manufacturer.	Submission Of Initial Parts, Part Change Submission, Testing & Qualification Data To Automotive Company.	Automotive Manufacturer Testing And Qualification Of Trial Material, Acceptance Of Part Change Submission By Automotive Manufacturer.	Communication Of Formal Approval To Change, Supply Chain Review, Editing Inventory To Determine Change Over Date.	New Material Supplied For Manufacturing Process Begins In Normal Supply Chain Process Flow.

Because of the safety critical concerns of various parts, the selection and use of suppliers must be approved throughout the entire supply chain. If issues are found with the new supplier material, they will typically be encountered at processed rod or wire manufacturing, cold forming manufacturing or final product use. Often the performance of these trials have not allowed our customers utilizing the Japanese BOF/ Bloom Cast material to convert to the EAF and/or Billet Cast supplier.

The quality requirements of this process have lead to the sources currently utilized. If our customers were forced to convert to EAF and/or Billet Cast materials this would create significant quality concerns within these parts. The quality and safety required by the automotive purchasing consumer is what directs our end customer to specific materials needed for their products.

Conclusion:

This request for exclusion details the reasoning behind the need for high quality Japanese BOF/Bloom Cast materials. This request supports the reasons outlined for securing exclusion as detailed within the 232 Steel Case Proclamation. The quality difference from our Japanese BOF/Bloom Cast Product is superior to that of the non-tariffed North American suppliers of EAF and/or Billet Cast process. This allows our customer to provide the high quality, high volume and cost competitive products the automotive manufacturers require. It is for this reason that I ask you to provide O&k American the Request For Exclusion from Remedies: Section 232 National Security Investigation of Steel Imports.

If I can answer any questions on this submission, please do not hesitate to contact me.