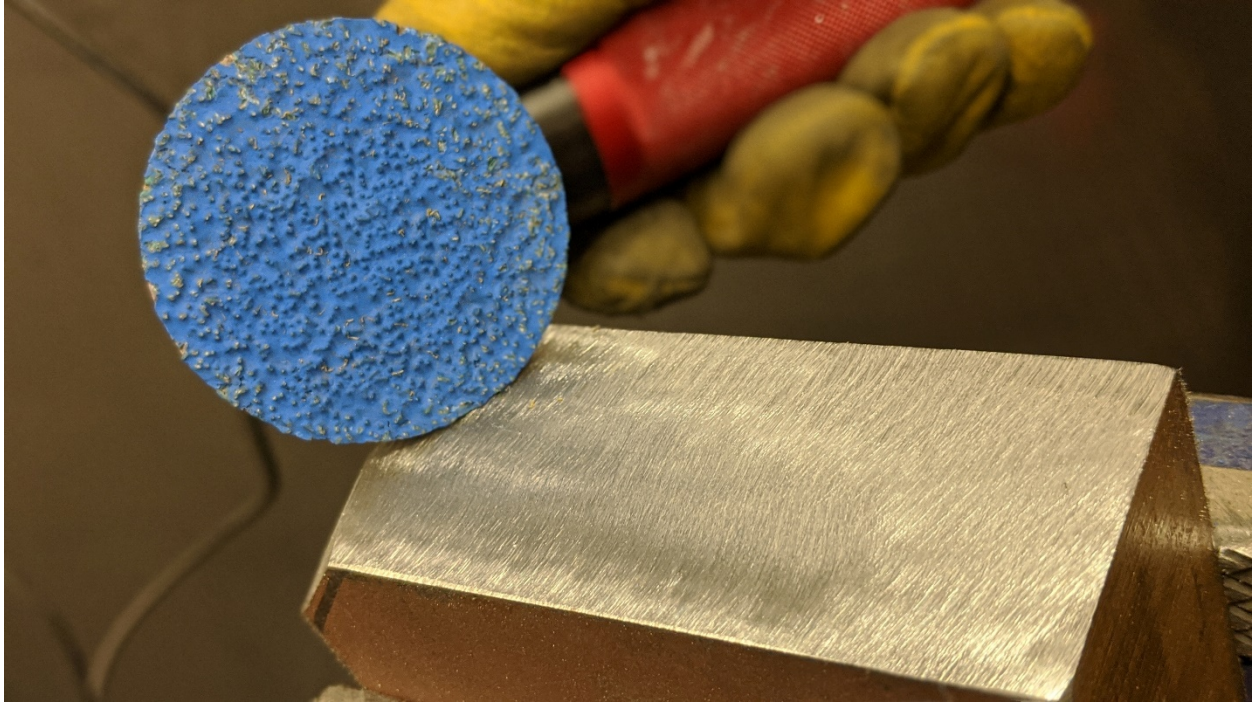


ALPHA-KUT™ Coated Abrasives

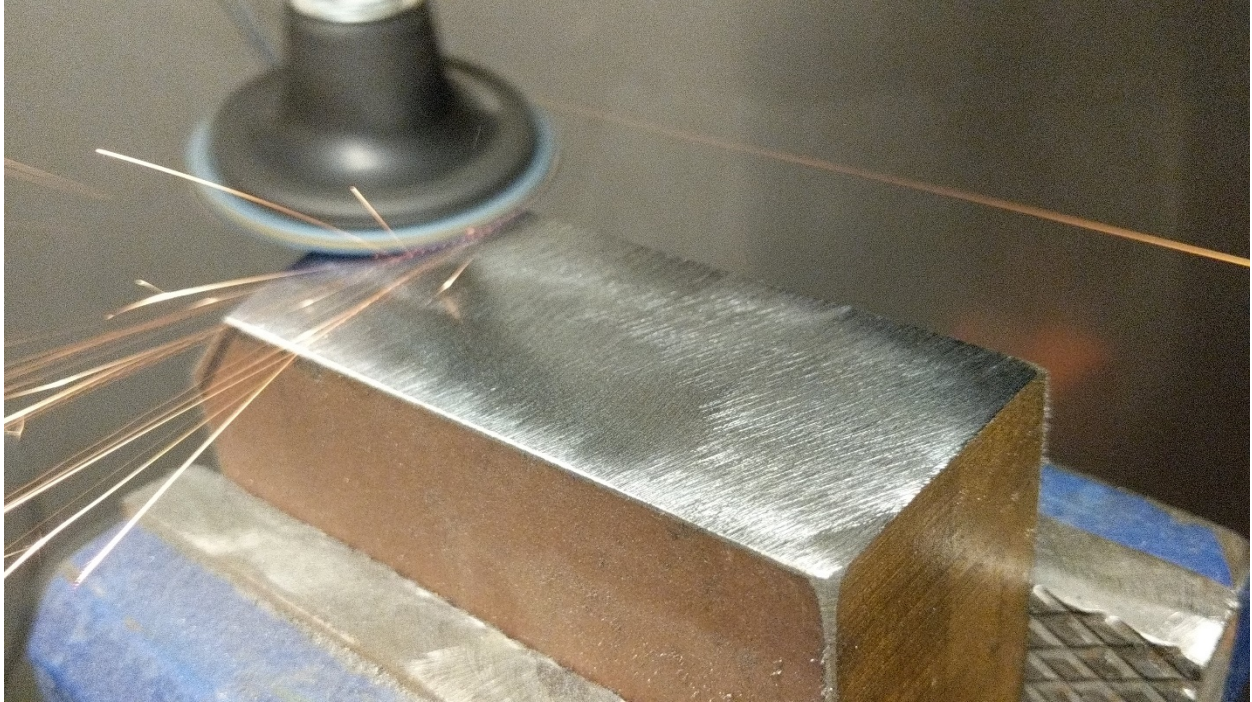
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## INTRODUCTION

As part of our core item offering, Superior Abrasives is a leader in quick change disc production and always looking for innovative additions to our product range. ALPHA-KUT™ is the introduction of our most aggressive coated material available in quick change form. As a potential replacement for some small cutting wheels, coated abrasives, especially in quick change form, are relatively user-friendly and much more forgiving than bonded products. Material can be removed quickly and shaped or smoothed over in one step, reducing tooling changeover for operators. ALPHA-KUT™ allows us to pursue industries like foundries and heavy-duty fabrication while offering a safer, less expensive alternative to some current products used.

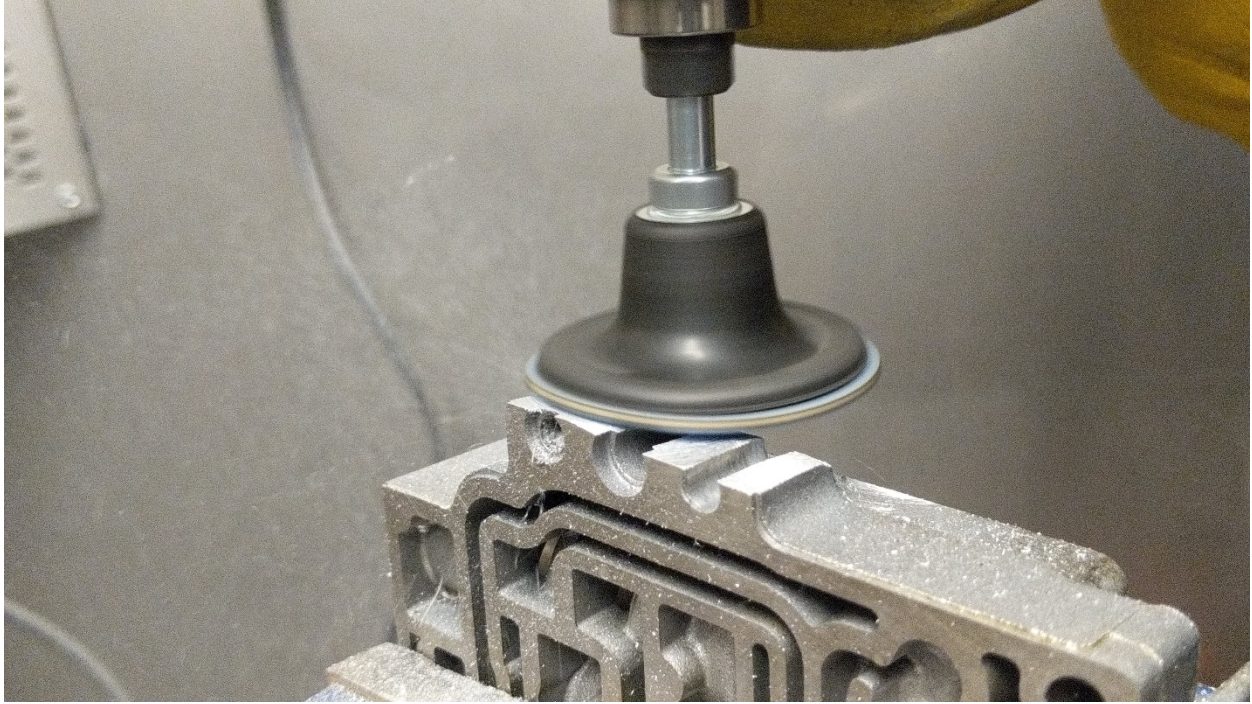


## PROPERTIES & CHARACTERISTICS

Our new ALPHA-KUT™ product consists of triangular, precision-formed abrasive grains, exhibiting the continually self-sharpening properties and wear characteristics of ceramics for maximum life and consistent cutting action. The triangular grains are applied upright for the sharpest cutting angle, which will reduce heat generation caused by friction. Additional grinding aid is added to prolong the cool-cutting action.

The strength of the manufactured grain is complimented with a rigid, fiber backing, producing stability and added pressure for maximum stock removal. In quick change form no additional liner or backing is necessary, as buttons are securely bonded directly to the fiber.

- Triangular, precision-formed ceramic grains
- Consistent, optimum cutting angle
- Self-sharpening ceramic wear characteristics
- Stable base with sharp cutting points
- Immediate, aggressive stock removal
- Durable, rigid fiber backing
- Reduced heat buildup with grinding aid



## APPLICATIONS

ALPHA-KUT™ quick change discs can simply be used in the same manner as other coated quick change discs, but would be overkill on anything less than heavy material removal or hardened materials. Primary examples include cast parts in which the sprue is removed, large parts with excessive parting lines, or large weld removal in narrow or otherwise inaccessible areas of larger workpieces.

- Cast parts shaping or removal, including sprues or parting lines
- Leveling and rough shaping
- Large weld or seam removal and blending
- Heavy material removal



## INDUSTRIES

Primarily, the foundry and fabrication industries are most accepting of aggressive removal products. Hours and even days are spent prepping large cast parts for further machining or final use, so reduced operator effort, or tooling and product changeover can accumulate to several hours of savings every week. In smaller forms of fabrication, ALPHA-KUT™ will be used as an ultra-aggressive coated abrasive producing speed over other products.

- Foundries and Fabricators using the following:
  - Cast Iron
  - Ductile Iron
  - Stainless Steel
  - Carbon Steel

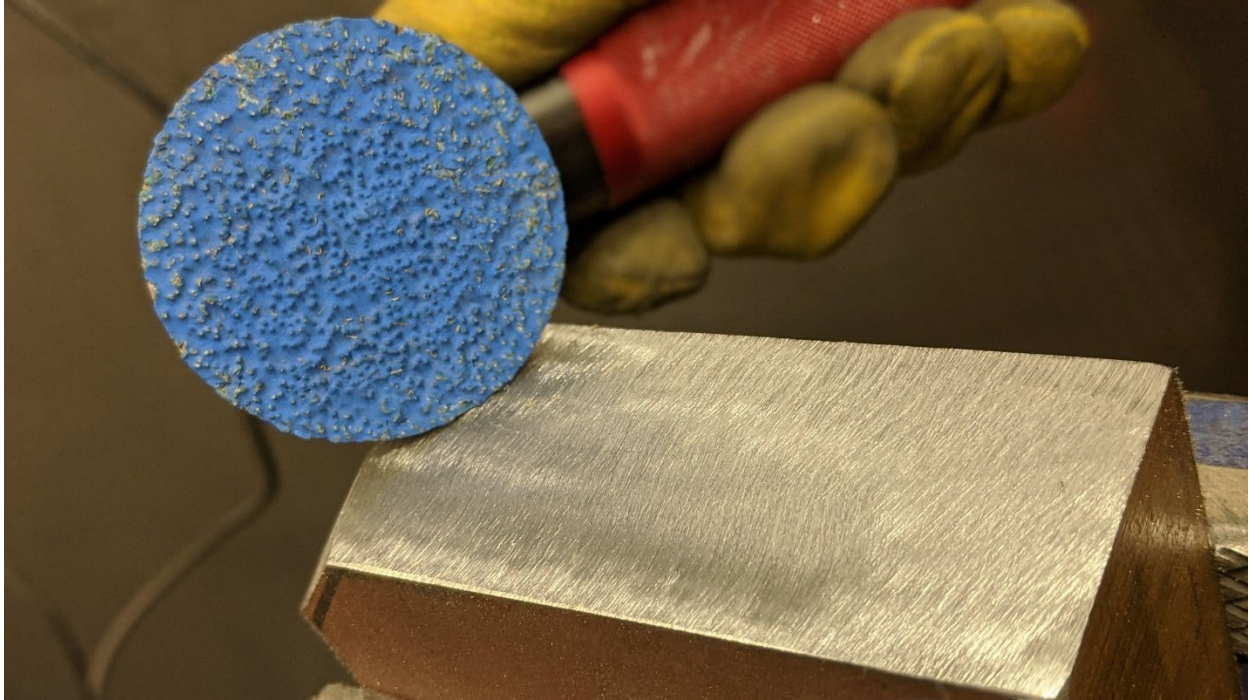


## PERFORMANCE

You will find that while ALPHA-KUT™ can complement existing coated abrasives, it may be a suitable replacement for small diameter or light-use cutting wheels. The relatively forgiving nature of coated quick change discs allows new and inexperienced operators to perform tasks without much risk to expensive workpieces, and can reduce secondary processes.

While quick change discs do not have the surface area of 4-1/2"+ resin fiber discs, they have the advantage of being controllable in narrow or hard-to-access geometries. ALPHA-KUT™ can also be presented as value-added solutions to the operator.

- Replacement for light-use cutting wheels
- Most aggressive coated abrasive
- More forgiving than cut-off or grinding wheels (bonded abrasives)
- Medium to high contact pressure



## AVAILABILITY

ALPHA-KUT™ quick change discs are available in limited sizes and only one grit size.

Type	Diameter	Max RPM	Optimal RPM	Std. Pkg.	36 Grit
<b>Type R</b>	1-1/2"	30,000	13,000	100	55841
	2"	30,000	10,500	100	55842
	3"	20,000	7,000	50	55843

- Type R quick change disc
- Military grade nylon button
- No additional backing liner
- Available in 1-1/2", 2", 3" diameter



# FIELD TESTS

## Purpose

To confirm findings in the lab of the material’s effectiveness on cast iron.

## Preparation

Two tests were performed in the lab using actual samples of cast iron from both specific locations. Images and videos of the products effectiveness were sent to both locations and corresponding distributor reps prior to scheduling the tests.

Engineering prepared the samples of the material and we brought air tools. To simplify inventory quantities, we only offered “R” type discs. We wanted to test the material at these locations and on actual work pieces with the operators. This requirement was communicated to both locations prior to the tests to ensure best use of time and detailed information required.

## ROWE FOUNDRY, Martinsville, IL

*Oldest foundry in the US. Large grey and ductile castings (0-5,000 lbs).*

We were able to test on both grey and ductile iron castings and in areas on the casting that are challenging. The production manager and operator performed the tests. The product worked exceptionally well and in a far shorter time than the stones or bonded items currently being used. It was determined that 1.5” and 3” would be most effective for the majority of the castings. The disc remained cool and functional for 20 minutes of the tests. Tests were performed in multiple stations including the robotic cell. The principals of Rowe believed that the product will dramatically reduce grinding time and cost. There are many areas of the foundry that this disc can be used especially in the finishing area. In one of the stations, the disc was used continuously for 20 minutes and completed the work piece. Once these casting are ground, they are shipped to the customer where they are assembled, painted, etc.

Rowe would like to order the 1.5 and 3” with holders from Industrial Supply Company. I believe their consumption will be approximately 300 per month.



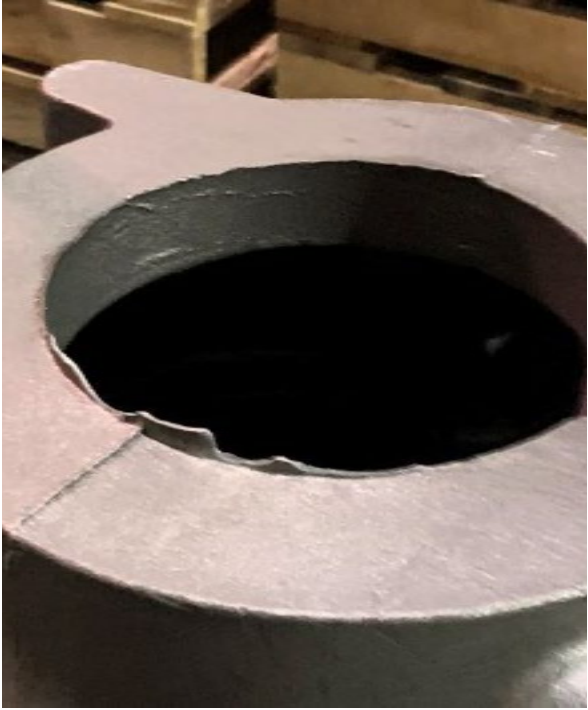
*Interior casting surface*



*Interior casting surface, close-up*



*Ductile iron casting*



*Ductile iron casting, close-up*



*Critical gasket surface*



*Critical gasket surface, close-up*

## **KIMURA FOUNDRY USA, Shelbyville, IN**

*Japanese foundry supplying prototype casting for Tier 1 auto makers and other industries. Kimura utilizes 3D pattern printing for precision grey, ductile and stainless castings.*

We were able to test a prototype cylinder head in areas that have been historically challenging for them i.e., gates, flashing etc. After these components are ground, they are sand-blasted and surface finish is inspected prior to the component being shipped to the customer. The operators used the Victograin on 4 “gates” of material that needed to be removed. These pieces were approximately  $\frac{3}{4}$ ” in diameter and 1” high. They are normally ground off with a Japanese-supplied small bonded wheel. The Victograin removed the pieces in under 5 minutes where the bonded wheel would normally require 20 minutes. The gasket surface was ground using the same disc. After the grinding of the gasket surface was completed, I asked regarding the time and ease. The operator stated that it was much easier, required less physical effort and took less time. I asked about the surface finish and he stated that it was the same or better than the result of the bonded. Once the component is ground, it is put into an automated sand-blaster.

This would step would confirm the effectiveness of the disc. The component was removed and the surface finish, post-grinding and post-sand blast was excellent. In the case of Kimura, this disc will not address all areas of grinding due to some of the intricacies of the components but it will address most applications. Photos and videos were not permitted.



*Multiple cylinder heads and grinding surface.*

## **Summary**

Our test in the lab with materials from both foundries. Yaunce tested it on multiple types of metals with mixed results. Due to the grain structure, this disc lends itself to the grey/ ductile iron applications. The

grain removes substantial and hard material without over-heating. The discs performed very well and exhibited resistance to wear.

The disc represents an alternative in cast iron and potential hardened tool steels to bonded abrasives, discs, burrs, and the like.

Both foundries represent different applications and requirements. The disc worked exceptionally well in both environments. Both applications do not use QCD and will require quotes on the discs and holders.

This product, when used in the correct application, will save a substantial amount of time in deburring, removing casting stock and finishing. We believe that it is a natural transition from bonded products and normal QCD.

With testing of hardened tool steel (TOOLOX 44) there is an opportunity to introduce this product outside of the foundry application and with the Tool & Die business where there is hardened metals.

### **SUB-TEST, Hardened Tool Steel**

*Due to the successful performance of the material on ductile and grey cast iron, it was decided to test the disc on hardened tool steel – Toolox 44. The steel is 45 HRC and primarily used in forging and stamping dies.*



*TOOLOX 44 Stock*



*TOOLOX 44, close-up*

- *Surface Condition:* Rough saw marks
- *Pre Test Sample Weight:* 2,847.80 grams/ 100.45 oz.
- *Test Period:* 20 secs
- *Post Test Sample Weight:* 2,842.40/ 100.26 oz
- *Post Test Surface Condition:* Complete removal of saw cut lines and stock removal of corners and edges

The material performed very well on test sample of 45 HRC. The test was conducted for 20 seconds. Saw lines were completely removed and the edges rounded without pressure or heat accumulation.



*Post-grinding surface with edge removal*



*Post-grinding surface, close-up*