

Bid Number: 760-06-20-050	Bid Opening Date & Time: 08/12/2020 02:00 PM
Items: Cutting Edges	Buyer: Vanessa Brosten
Bid Mailing Address: 608 East Boulevard Avenue	Telephone Number: 701-328-4466
City, State, Zip: Bismarck, North Dakota, 58505-0700	Email: vbrosten@nd.gov
Contract Period: 08/17/2020 TO 07/31/2021	Date Prepared: 07/24/2020

BID RESPONSE

Please submit your bid response on the attached forms in conformance with the instructions and specifications in the NDAC 04-12-01 – 04-12-16. One copy of your bid response must be returned to the North Dakota Department of Transportation (NDDOT) prior to the time and date specified for the bid opening. Bid responses received after the time and day specified for the bid opening will be rejected. Mark envelope with word "BID" and the opening time and date. **If your bid response is accepted by NDDOT, then your bid response will constitute a binding contract.**

CONTRACT

This contract is made and entered into by and between NDDOT for the state of North Dakota (hereinafter state) and

Vendor Name KUEPER NORTH AMERICA	Vendor Address 171 CHURCH ST. STE 300 CHARLESTON, SC 29401
--	--

(hereinafter vendor). In consideration of and for the acceptance by the state of the offer made by the vendor pursuant to the bid response, the vendor agrees and promises to sell, furnish, and deliver to the state, at the time, places, and prices specified in the bid response, all goods, merchandise, supplies, commodities, equipment, or other items contained in the bid response and for which the vendor has been awarded this contract by the state. The vendor shall fully perform this contract in accordance with the terms and conditions contained in the bid response including all specifications, rules, or regulations mentioned therein, and shall comply with all applicable provisions of the NDAC 04-12-01 – 04-12-16 promulgated by the State Purchasing Division; such manual being made a part of this contract by reference. The Risk Management Appendix and Appendices A and E of the Title VI Assurances, attached, are hereby incorporated into and made a part of this agreement.

The following must be completed by the vendor; failure to do so may result in the rejection of the vendors bid proposal.

Vendor Name KUEPER NORTH AMERICA		
Mailing Address 171 CHURCH ST. STE 300 CHARLESTON, SC 29401		
Telephone Number 843-723-7361	Fax Number 843-723-7362	E-mail Address PSCHUSTER@KUEPERBLADES.COM

GARDNER WILLIS, MANAGING PARTNER

Name & Title (Type or Print)
 Signature
 Date

To be signed by **Owner; Partner; Corp. Pres., Vice Pres., or other authorized Corp. Officer** or bid may be rejected. (if signed by other authorized Corp. Officer, please attach copy of Power of Attorney or other documentation showing authority to sign.)

FOR ND DEPARTMENT OF TRANSPORTATION USE ONLY Accepted by the state according to provisions of award.

Authorized Signature <i>[Signature]</i>	Date 10/5/2020
Recommended for approval Brand. Dan	Date 10-1-2020
	Approximate contract amount \$ UNKNOWN



APPROVED as to execution this
 01st day of October 20 20
 ATTORNEY GENERAL
 By *[Signature]*
 SPECIAL ASST. ATTORNEY GENERAL

MAILING INSTRUCTIONS

Mail only one completed and signed request for bid document per envelope, unless instructed otherwise. Request for bid documents not signed or received after the date and time specified in the request for bid will be rejected.

BID IS: SEALED NOT SEALED

Address the envelope containing your response in the following manner:

BID NUMBER – 760-06-20-050
BID OPENING DATE/TIME – August 12, 2020; 2:00 P.M. Central
N. D. DEPT. OF TRANSPORTATION
PROCUREMENT SECTION
608 E BOULEVARD AVE
BISMARCK ND 58505-0700

Sealed bids will be received for furnishing "**CUTTING EDGES**" as per the following instructions and specifications. To be considered, this bid form must be completed in its entirety and received by the **North Dakota Department of Transportation (NDDOT), 608 E. Boulevard Avenue, Bismarck ND 58505-0700 no later than 2:00 PM CENTRAL TIME, WEDNESDAY, AUGUST 12, 2020**, at which time and place such bids will be properly opened and read.

BIDDERS INSTRUCTIONS

1. **Additional Terms and Conditions.** Additional terms and conditions submitted with a bid response are of no effect unless accepted in writing by the Purchasing Agency. Bids with additional terms and conditions may be rejected as non-responsive. (N.D.A.C. § 4-12-11-06)
2. **Assistance to Bidders with a Disability.** Bidders with a disability and/or language assistance, contact Civil Rights Division, NDDOT, 701-328-2978 or civilrights@nd.gov or TTY 711, as soon as possible so that reasonable accommodations can be made. Additionally, the Request for Reasonable Accommodations form (SFN 60135) can be accessed at the following NDDOT website location: <http://www.dot.nd.gov/forms/sfn60135.pdf>.
3. **Award.** Award will be made to a responsive, responsible bidder with the lowest price considering conformity with specifications, terms of delivery, quality, and serviceability. NDDOT reserves the right to consider bids varying in minor respects from any specific requirements herein, but judged to meet the intent of this request. Bidders interested only in the total low bid for all items are to state 'all or nothing' on their bid response. Award will be made as follows:
 - Split award per group
4. **Award – Preference Laws.** If bid responses are received from nonresident (out-of-state) bidders, the Procurement Officer will apply reciprocal preference, if applicable, in accordance with N.D.C.C. §44-08-01. See OMB Guidelines on North Dakota Preference Laws.
5. **Award – Tie Bid Preference.** After applying any reciprocal preference, if a tie occurs between two or more bidders with equal bid prices or offerors with identical evaluation scores:
 - Preference must first be given to bids submitted by resident North Dakota vendors.
 - If a tie remains, preference is given to approved vendors on the Bidders List.
 - If a tie still remains, award shall be made in accordance with N.D.A.C. § 4-12-11-05.
6. **Bid Bond.** Waived in this instance: however, bidder(s) failing to enter into a contract with this office, upon notification of award, may be subject to removal from the bidder's list.
7. **Bid Held Firm.** Bids are not awarded at the bid opening. Bid responses will be firm for 30 days, unless stated otherwise.

8. **Bid Opening.** All sealed bids received by the NDDOT Procurement Office will be opened and read at 608 East Boulevard Avenue, Bismarck, North Dakota, at the time specified in the solicitation. Interested parties are invited to attend the bid opening.
9. **Bid Summary.** Interested parties may contact the Procurement Officer to obtain a summary of all bid responses received and the award. When bids are issued using the State's electronic bidding system, the bid summary will be posted and available for download from: <https://www.nd.gov/omb/vendor>. Bid summaries will be mailed to those bidders who supply a self-addressed, stamped envelope with their bid response. A copy of the bid summary may also be obtained by visiting the NDDOT Procurement Office during normal working hours.
10. **Bidder Checklist.** HAVE YOU REMEMBERED TO:
- Review all instructions, terms and conditions, and specifications to ensure your bid response complies?
 - Prepare your price in the specified unit of measure, F.O.B. Destination, Freight Prepaid to the delivery location listed on the cover sheet?
 - Indicate whether you can meet the delivery date indicated on the cover sheet?
 - Sign your bid response on the cover sheet?
 - Initial all changes and corrections?
 - Submit any required samples or enclosures, if applicable?
 - Mark the envelope as indicated above?
 - Review and complete all requirements contained in this solicitation to ensure compliance.
11. **Clarifications, Bid Changes and Questions Deadline.** The Procurement Officer is the point of contact. Any irregularities, lack of clarity, requested bid changes and all questions regarding this bid and the procurement process must be addressed to the Procurement Officer referenced on the first page of this document not later than end of business July 31, 2020. (Contact information is indicated on cover page). If a bid amendment is required, it will generally be issued after this date.
- The bidder is cautioned that the requirement of this solicitation can be altered only by written amendments and that verbal communications from whatever source are of no effect.
12. **Corrections.** The bidder's authorized representative must initial any corrections and alterations (i.e. erasures, whiteouts, correction tape, etc.) made to the bid response. Those bid responses with corrections and alterations that are not initialed are subject to confirmation by the Procurement Officer.
13. **Definitions.**
- Bidder - any person or firm submitting a competitive bid in response to a solicitation.
 - Bid summary - a summary of all bid responses received by the NDDOT Procurement Office.
 - Bid response - the executed document submitted by a bidder in response to a solicitation.
 - Commodities – all property, including equipment, supplies, materials, printing, insurance, and the lease of equipment.
 - Contract - a deliberate written agreement between two or more competent persons to perform specific act or acts.
 - Contractor - any person or firm having a contract with a governmental body.
 - N.D.A.C. – North Dakota Administrative Code, rules with the force and effect of law.
 - N.D.C.C. – North Dakota Century Code, state laws.
 - Solicitation - the process of notifying prospective bidders that the State wishes to receive bids for furnishing goods or services.
 - SPO Online – a procurement information website maintained by OMB State Procurement Office pursuant to N.D.C.C. § 54-44.4-14.
14. **Electronic & Facsimile Bids.** Sealed bids are required; therefore, bids cannot be submitted by email or fax to the Procurement Officer. Bid responses emailed or faxed may be rejected as non-responsive. Bids may be emailed or faxed to a third party who will put it in a properly-addressed envelope and deliver it to the NDDOT Procurement Office before the date and time specified in the solicitation.

15. **Upload Response Through the State Procurement Online System (SPO Online)**. Bidders may electronically submit Bid Responses through the State Procurement Online system (SPO Online) by the Bid Response Closing Deadline.

A. This solicitation is posted on SPO Online at: <https://www.nd.gov/omb/vendor>

B. Click on "Bidding Opportunities." Go to "Recent Solicitations" and find this solicitation.

C. Use "Upload Response" to upload a maximum of five (5), clearly labeled documents before the deadline for receipt of proposals in the Bid Response closing deadline.

D. Offerors must upload their Technical Proposal and Cost Proposal in separate files.

E. The maximum file size allowed is 50mb per file.

F. All field entries must be alphanumeric. Dashes and underscores are allowed; however the system does not accept other special characters such as apostrophe, & symbol, quotation marks, etc.

G. Bidders will receive an email confirmation from infospo@nd.gov that the upload response was received including the "File Description" for the uploaded files. Review this email to ensure all files were successfully uploaded. If you do not receive an email confirmation, the upload was not successful, and you will need to upload the files again. If you do not receive an email confirmation after the reattempt, contact the Procurement Officer or the State Procurement Office at infospo@nd.gov or 701-328-2740.

Visit <https://www.nd.gov/omb/vendor/bidder-resources> for the SPO Electronic Response Job Aid which describes how to submit an electronic response.

16. **Freight/F.O.B. Destination**. Freight and transportation charges are to be included in the price of the products, unless otherwise specified in the solicitation. (F.O.B. - Free On Board).
17. **Indemnification**. Bidders must review the attached Risk Management Appendix for indemnification and insurance requirements. The indemnification and insurance provisions are incorporated and made part of this solicitation and the resultant final contract. Objections to any of the provisions of the indemnification and insurance requirements must be made in writing to the attention of the Procurement Officer by the time and date set for receipt of questions. No alteration of these provisions will be permitted without prior written approval from the Purchasing Agency or Entity in consultation with the North Dakota Risk Management Division. Upon receipt of the Notice of Award, the successful bidder must obtain the required insurance coverage and provide the Procurement Officer with proof of coverage prior to contract approval. The coverage must be satisfactory to the Purchasing Agency or Entity, in consultation with the North Dakota Risk Management Division. A bidder's failure to provide evidence of insurance coverage is a material breach and grounds for withdrawal of the award or termination of the contract.
18. **Late Bids**. It is the bidder's responsibility to ensure that a bid response is physically deposited with the NDDOT Procurement Office prior to the date and time specified for the opening. Late bids will be rejected, regardless of the degree of lateness, unless the delay is due to the error of the Purchasing Agency and discovered before the selection of the successful bidder.
19. **Minor Informalities**. The State reserves the right to waive minor informalities in bid responses in accordance with N.D.A.C. 4-12-10. Minor informalities are insignificant omissions or nonjudgmental mistakes that are matters of form rather than substance, evident from the bid document, with a negligible effect on price, quantity, quality, delivery, or contractual conditions that can be waived or corrected without prejudice to other bidders.
20. **Multiple Bid(s)**. Bidders may submit more than one bid response(s) for the item(s) specified in the solicitation. Each bid submitted must comply in all aspects with the bid requirements and these instructions.
21. **Negotiation**. NDDOT reserves the right to negotiate with the successful bidder to ensure the best possible consideration is afforded to all concerned.
22. **New Equipment and Materials**. Unless otherwise indicated in the detailed specifications of this solicitation, all equipment and materials shall be new and under current production for use in the United States.
23. **Open Records Requests**. Bid responses are exempt records until the date and time of the bid opening. After the bid opening, all bid responses are subject to North Dakota open records laws. Interested parties may contact the Procurement Officer to request information related to this solicitation.

24. **Packaging.** All shipments are to be packaged according to accepted commercial practices to avoid damage in shipment.
25. **Performance Bond.** Successful bidders will not be required to furnish a performance bond; however, failure to perform satisfactorily will result in the immediate termination of the contract(s) and bidders may be subject to removal from the bidder's list.
26. **Preparation of Bid.** Bids will be accepted on NDDOT forms only. If the document is located on the State Procurement Office website, then bidder is to download the document and type or write their responses as indicated by the bid document. Alteration of the bid document may be cause for bid rejection. Bidders are cautioned to examine specifications and all instructions. Failure to do so will be at the bidder's risk.
27. **Pricing.** Unit prices are to be stated in United States currency and based on the unit of measurement specified in the solicitation, F.O.B. Destination, to the NDDOT delivery locations specified herein.

In the event of mathematical differences between the unit price and extended total, the unit price will prevail.

28. **Protests.** Protests of the solicitation must be received by the Procurement Officer within seven days before the bid closing deadline. Protests of the award or Notice of Intent to Award must be received by the Procurement Officer within seven days after receiving notice of award. Seven calendar days after award or issuance of the Notice of Intent to Award it will be assumed that all interested parties knew or should have known all the facts surrounding the award. Protests must be made in writing to the Procurement Officer and include the basis for the protest. (N.D.C.C. § 54-44.4-12; N.D.A.C. § 4-12-14.)
29. **Rejection.** The State reserves the right to reject any and all bid responses in whole or in part. The Procurement Officer will send a rejection notice, including the reason for rejection. Bid responses may be rejected if:
 - The bid response is not legible.
 - The bid response is not completed as requested.
 - The bid response is faxed to the procurement office.
 - The bid response is not responsive to the specifications or other requirements of the solicitation.
 - The bid response is received after the time and date specified.
 - The bidder has not met Vendor Registration requirements or is suspended or debarred.
 - The bid document has been altered by the bidder.
 - The bidder is determined to be not responsible (N.D.A.C. 4-12-11-04).

If all bids are rejected, the Procurement Officer will send written notice to bidders, including the reason all bids were rejected.

30. **Signature.** The bid must be signed manually in ink. The name and title of the person signing the bid response must be typed or printed above the signature. The bid must be signed by **Owner, Partner, Corp. Pres., Vice Pres., or other authorized Corp. Officer** or the bid may be rejected. If signed by other authorized Corp. Officer or representative, please attach a letter signed by the Owner, Partner, Corp. Pres., or Vice Pres. indicating the individual has authority to enter into a contract on behalf of the company (or a Power of Attorney).
31. **Specifications, Brand Name or Equivalent.** Unless otherwise indicated in the detailed specifications of this solicitation, the use of a specific brand name or make/model is for illustrative purposes only, and the State will consider equivalent products. If a commodity or service put forth by a bidder is rejected as not being equivalent, the Procurement Officer will notify the bidder of the rejection.
32. **Specifications, Compliance.** All Bid Responses must comply with the stated specifications, and the successful Bidder will be held responsible. Bidders who desire to submit commodities or services that deviate from these specifications or have any objections to the stated specifications must contact the Procurement Officer by the deadline for questions or at least seven days before the Bid Response closing deadline, so the Procurement Officer can determine whether the specifications need to be amended.
33. **Supplemental Terms and Conditions.** Bids including supplemental terms and conditions will be accepted, but supplemental conditions that conflict with any conditions contained in this ITB or that diminish the State's rights will be considered null and void. The State is not responsible for identifying conflicting supplemental terms and conditions before issuing a contract award.

After award of contract:

- a) If a conflict arises between a supplemental term or condition included in the bid and a term or condition of the ITB, the term or condition of the ITB will prevail, and,
- b) If the State's rights would be diminished as a result of application of a supplemental term or condition included in the bid, the supplemental term or condition will be considered null and void.

Changes, modifications, additions, or alterations to the bid document could be cause for rejection of the submitted bid at the sole discretion of the NDDOT. Contact the Procurement Officer in writing prior to the deadline for clarifications.

34. **Taxes.** The State does not pay sales tax or federal excise tax. The state sales tax exemption number is E-2001. The federal tax-free transaction number is 45-70-0010K. The Purchasing Agency will furnish a tax exempt certificate upon request.
35. **Vendor Registration.** Bids will be accepted from bidders who are not currently Approved Bidders for the State of North Dakota; however, the successful bidder may be required to become approved prior to award, in accordance with N.D.C.C. 54-44.4-09. To become an Approved Bidder, you must: 1) register with the North Dakota Secretary of State (fees apply), and 2) submit a completed Bidder List Application to the ND State Procurement Office. Registration instructions and forms are available on-line at: www.nd.gov/spo/vendor. Contact the ND State Procurement Office at 701-328-2683 or infospo@nd.gov for assistance.

Placement on the bidders list does not guarantee a bidder will receive notice of every formal solicitation. Bidders must maintain current information by submitting a Notice of Change form to the State Procurement Office (Fax 701-328-1615). Visit the website for forms: www.nd.gov/spo/vendor.

36. **Withdrawal or changes to a bid response prior to the bid opening date and time.** A bidder may withdraw or make a change to his bid response prior to the bid opening date and time. The request to make a change or withdraw must be in writing by a representative of the firm. The request to withdraw or change must be signed by the bidder or his designated representatives.
37. **Withdrawals after the bid opening date and time.** After the bid opening, no changes may be made to the bid response. The bidder may make a written request to withdraw the bid response, subject to approval by the NDDOT Procurement Office. Vendors continually withdrawing bids after the bid opening may be removed from the Vendor Database.

GENERAL CONTRACT TERMS AND CONDITIONS

1. **Affirmative Action.** The contractor will take affirmative action in complying with all Federal and State requirements concerning fair employment and employment of individuals with disabilities, and concerning the treatment of all employees without regard to discrimination by reason of race, color, religion, sex, national origin, or disability.
2. **Applicable Law and Venue.** Any dispute arising out of this agreement will be resolved under the laws of the State of North Dakota.
3. **Billing and Payment Procedures.** Purchase orders may be issued by NDDOT Procurement Office, or individual NDDOT District locations during the contract period.

Invoices are to be submitted as indicated on the purchase orders unless otherwise instructed. Failure to submit correct invoices to the appropriate NDDOT office may delay contractor payment.

Payment will normally be made within thirty days after delivery and acceptance of commodities or services under this contract and receipt of a correct invoice. All invoice and payment inquiries must be directed to the purchasing agency.

4. **Binding Contract.** The acceptance of a bid response in writing by the purchasing agency constitutes a contract between the bidder and the State. Written acceptance from the purchasing agency may be made by execution of a contract, purchase order, or order using a state purchasing card. Any oral agreement or

arrangement by a bidder with a State employee or purchasing agency will have no force or effect unless reduced to writing. This contract is not effective until fully executed by both parties.

5. **Compliance with Laws.** The contractor must, in performance of work under this contract, fully comply with all applicable federal, state or local laws, rules, regulations and policies, including those relating to nondiscrimination, affirmative action, accessibility and civil rights including Title VI of the Civil Rights Act of 1964. The contractor agrees to file all required reports on time, to make required payroll deductions, and to pay all taxes and premiums owed on time, including sales and use taxes and unemployment compensation and workers' compensation premiums. The contractor shall have and keep current at all times during the term of this contract all licenses and permits required by law.
6. **Contract Amendments, Unanticipated Amendment.** After a binding contract has been entered into, no changes (i.e. additions, substitutions, subcontracting or a price adjustment) may be made, unless prior approval has been obtained from the purchasing agency and Procurement Officer. The contractor may request changes, such as substitutions of a product, by submitting a written request to the Procurement Officer. Unanticipated amendments must be within the scope of the original contract, authorized by the terms of the contract due to legitimate, unforeseen circumstances. . (N.D.A.C. ch. 4-12-13)

The terms of this contract shall not be waived, altered, modified, supplemented, or amended, in any manner whatsoever, except by written instrument signed by the parties. No waiver consent, modification or change of terms of this agreement shall bind either party unless in writing and signed by both parties. Such waiver, consent, modification, or change, if made shall be effective only in the specific instance and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this agreement.

7. **Contract Price Adjustment.** The Contract Unit Prices shall be firm for the twelve (12) months of the contract period. On an annual basis, all unit prices may be subject to price adjustment (increase / decrease). The request for a price adjustment shall be submitted to the Procurement Office at least forty five (45) days before the scheduled contract expiration date and must include justification for the proposed change. The Procurement Officer will respond as follows:
 1. The request may be granted,
 2. The contract may be cancelled and solicitation may be re-advertised, or
 3. The contract may be continued without change.

If a price increase is approved by the NDDOT, the date the increase will be effective along with the new unit prices will be included in an amendment document. Approval of any price increase renews the twelve month firm price period.

The State shall also be advised of and receive the benefit of any price decrease. The same notification and review process will apply to a decrease in cost.

8. **Contract Term and Renewal Option.** The NDDOT will enter into a contract with an effective date **beginning August 17, 2020, and ending July 31, 2021**, inclusive. This contract may be renewed upon satisfactory completion of the initial contract term. The NDDOT reserves the right to execute up to two options to renew this contract for a period of twelve (12) months each, not to exceed thirty-six (36) months total. Renewals will be documented by amendment.

The NDDOT reserves the right to renegotiate price and terms provided that such negotiated price and terms fall within the original scope of work for this bid. Negotiations may be conducted annually or at such times that additional and unexpected services falling within the scope of the contract may occur. Such changes will be documented by amendment to the contract.

9. **Contract Termination.**

- a. **Termination without Cause.** This contract may be terminated by mutual consent of both parties, or by either party upon 30 days' written notice.
- b. **Termination for Lack of Funding or Authority.** The State may terminate this contract effective upon delivery of written notice to the contractor, or on any later date stated in the notice, under any

of the following conditions:

- i. If funding from federal, state, or other sources is not obtained and continued at levels sufficient to allow for purchase of the services or supplies in the indicated quantities or term. The contract may be modified by agreement of the parties in writing to accommodate a reduction in funds.
- ii. If federal or state regulations or guidelines are modified, changed or interpreted in such a way that the services are no longer allowable or appropriate for purchase under this contract or are no longer eligible for the funding proposed for payments authorized by this contract.
- iii. If any license or certificate required by law or regulation to be held by the contractor to provide the services required by the contract is for any reason denied, revoked or not renewed.

Any such termination of this contract under (i), (ii), or (iii), above, shall be without prejudice to any obligations or liabilities of either party already accrued prior to such termination.

- c. **Termination for Cause.** The State by written notice to the contractor may terminate the whole or any part of this contract:
 - i. If the contractor fails to provide services required by this contract within the time specified herein or any extension thereof; or
 - ii. If the contractor fails to perform any of the other provisions of this contract, or so fails to pursue the work as to endanger performance of this contract in accordance with its terms and after receipt of written notice from the State, fails to correct such failures within ten days or such longer period as NDDOT may authorize.
 - iii. The rights and remedies of the State provided in the above clause related to defaults by the contractor are not exclusive and are in addition to any other rights and remedies provided by law or under this contract.
- d. **Termination, Deliveries.** If the contract is terminated for any reason, the contractor is responsible for delivery of all commodities and services ordered prior to the termination, unless those orders had been canceled by the Purchasing Agency or Entity.

10. **Inspection and Investigations.** The State reserves the right to conduct inspections and investigations related to the bidder and the offered commodities or services, including but not limited to the firm, personnel, qualifications, and the commodities and services offered to make determinations regarding compliance with the bid requirements and responsibility of the bidder. All material and workmanship are subject to inspection and testing by the State at the point of manufacturer, place of storage, or upon receipt. The State reserves the right to reject any commodities or services and terminate the contract if the Contractor fails to comply with the specifications, terms and conditions, or the seller's express or implied warranties. Rejected commodities will be removed at the Contractor's expense. Failure to satisfactorily perform may result in suspension or debarment from the Bidders List.

If commodities or services are rejected as being not compliant with the requirements of this solicitation, the State will inform the CONTRACTOR in writing. The Purchasing Agency may provide the CONTRACTOR with a reasonable opportunity to cure, whenever practicable, as set forth in writing by the Purchasing Agency.

11. **Materials and Workmanship.** All material and workmanship shall be subject to inspection and testing at the discretion of the purchasing agency either at the point of manufacturer, place of storage, or upon receipt.
12. **Receiving.** Deliveries must arrive at the designated destination(s) during normal business hours unless other shipping/receiving instructions are issued by NDDOT personnel. The contractor shall contact the NDDOT to schedule delivery dates and times at least 24 hours in advance of delivery.

All NDDOT offices will be closed in recognition of State holidays. Any day declared a holiday by the President or Governor will also be recognized by office closure.

13. **Responsibility of the Bidder.** The Procurement Officer, at any time, may make a supplementary investigation as to the responsibility of any bidder, even though the Bidder may be on the Bidders List. If a bidder is determined to be not responsible, that bid response will be rejected even if it is the lowest bid response received, and the bidder may be debarred or suspended from the bidders list. (N.D.A.C. § 4-12-11-04)

14. **Specifications:** Bidder's shall submit detailed manufacturer's specifications along with this response, and upon acceptance of the bid, shall become part of the bidder's specifications. Specifications must include: brand, composition, blade analysis, hardness rating, design, dimensions, weight, etc. Promotional literature is generally not adequate. Any discrepancies between products to be furnished on the bid and manufacturer's printed specification must be documented.
15. **Subcontracts, Assignment.** The contractor shall not subcontract, assign or transfer the contractor's interests or duties under this contract without express written consent of the purchasing agency. However, the contractor may enter into subcontracts provided that any such subcontractor acknowledges the binding nature of this contract and incorporates this contract, including any attachments. The contractor is solely responsible for the performance of any subcontractor. The contractor shall not have the authority to contract for or incur obligations on behalf of the State.
16. **Successors in Interest.** The provisions of this agreement shall be binding upon and shall inure to the benefit of the parties hereto, and their respective successors and assigns.
17. **Testing and acceptance:** Blades may be tested upon delivery to ensure compliance with specifications prior to payment. The testing procedure requires approximately sixty (60) days. Materials failing to meet specifications will be returned at the bidder's expense.
18. **Service Representative.** The contractor must provide a dedicated customer service representative to provide support for this contract. The contractor shall notify the Procurement Officer in the event the representative is changed.

NAME: PATRICIA SCHUSTER
 (Name of person servicing this contract)

BUSINESS NAME: KUEPER NORTH AMERICA

MAILING ADDRESS: 171 CHURCH STREET, STE 300

CITY & STATE: CHARLESTON, SC ZIP CODE: 29401

PHONE NUMBER: 843-723-7361 TOLL FREE: —

FAX NUMBER: 843-723-7362 E-MAIL: PSCHUSTER@KUEPERBLADES.COM

**SECTIONAL TUNGSTEN CARBIDE INSERTED
SNOWPLOW ENCASED-IN RUBBER CUTTING EDGES, 6" HEIGHT, 5/8" HOLE-PUNCHING**

Similar or equal to JOMA brand blades AND PolarFlex brand blades

Individual steel segments encased in rubber with steel bushings positioned on 12" centers to mount to a snow plow. Each segment is inserted with tungsten carbide bits, brazed in place along the wear edge. The finished blade is approximately 7/8" thick by 6" wide by 4' long. Steel bushings are located 1.5" from the top of the blade on 12" centers. Each blade will have orientation embossed in the rubber casing. A 1/2" X 3" clamp bar is mounted on top to hold the blade to the plow. The clamp bar should weigh approximately 5 lbs per foot and have 11/16" square holes located on 12" centers to align with the bushings in the blade. If supplying a product equivalent to JOMA or POLARFLEX, literature must be provided.

Option 1: Carbide impregnation is not required on the curb-runner guard.

Detailed Specifications	Unit Price Each
JOMA 6000 ARTICULATING SYSTEM, <u>LESS CURB-RUNNER GUARD</u> NDDOT P/N 76006-367000	
10' System FOB ANY NDDOT District	\$ NO BID
11' System FOB ANY NDDOT District	\$ NO BID
12' System FOB ANY NDDOT District	\$ NO BID
JOMA 6000 X 4' (39#) RUBBER EDGE – OR EQUAL NDDOT P/N 76006-367005	
FOB ANY NDDOT District	\$ NO BID
JOMA 6000 X 3' RUBBER EDGE – OR EQUAL NDDOT P/N 76006-367006	
FOB ANY NDDOT District	\$ NO BID
JOMA BS23901 4' BACK SUPPORT – OR EQUAL NDDOT P/N 76006-367010	
FOB ANY NDDOT District	\$ NO BID
JOMA BS23902 3' BACK SUPPORT – OR EQUAL NDDOT P/N 76006-367011	
FOB ANY NDDOT District	\$ NO BID
JOMA STRAP 4SEH (20#) – OR EQUAL NDDOT P/N 76006-367015	
FOB ANY NDDOT District	\$ NO BID
JOMA STRAP 3SEH (15#) – OR EQUAL NDDOT P/N 76006-367016	
FOB ANY NDDOT District	\$ NO BID

BIDDER KUEPER NORTH AMERICA

Quantity	Unit	Detailed Specifications	Unit Price Each
OPTION 1 - JOMA CURB-RUNNER GUARD 663158PLH (LEFT) NDDOT P/N 76006-367020			
FOB ANY NDDOT District			\$ NO BID
OPTION 2 - JOMA CURB-RUNNER GUARD 663158PRH (RIGHT) NDDOT P/N 76006-367020			
FOB ANY NDDOT District			\$ NO BID

BRAND NAME: N/A

MANUFACTURER: N/A

INITIAL ORDER DELIVERY DAYS ARO N/A

DELIVERY FOR REORDERS N/A DAYS

BIDDER KUEPER NORTH AMERICA

Quantity	Unit	Detailed Specifications	Unit Price Each
X-48-W ASSEMBLY, 4' POLARFLEX FRONT MOUNT SYSTEM C/W 5/8" X 6" ADAPTER BLADES, 12' PLOW (3PER) – OR EQUAL NDDOT P/N 76006-367700			
FOB ANY NDDOT District			\$ <u>NO BID</u>
5/8" X 6" POLARFLEX XWS-12 ADAPTER BLADES – OR EQUAL NDDOT P/N 76006-367500			
FOB ANY NDDOT District			\$ <u>NO BID</u>
X-48-W-F, COMPLETE 4' SECTION, POLARFLEX – OR EQUAL			
FOB ANY NDDOT District			\$ <u>NO BID</u>
BUX-48-W, 4' ADAPTER BLADE, POLARFLEX – OR EQUAL			
FOB ANY NDDOT District			\$ <u>NO BID</u>
AUX-48, FRONT ANGLE – OR EQUAL			
FOB ANY NDDOT District			\$ <u>NO BID</u>
POLARFLEX CURB GUARD 10620029 – OR EQUAL			
FOB ANY NDDOT District			\$ <u>NO BID</u>

BRAND NAME: N/A

MANUFACTURER: N/A

INITIAL ORDER DELIVERY DAYS ARO N/A

DELIVERY FOR REORDERS N/A DAYS

BIDDER KUEPER NORTH AMERICA

**NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
SPECIFICATIONS FOR
THROUGH-HARDENED STEEL MOTOR GRADER CUTTING EDGES**

GENERAL SPECIFICATIONS:

1. Cutting edges must be cut in the lengths as specified herein.
2. Cutting edge ends shall be cleanly cut.
3. Cutting edges shall be uniformly through-hardened to Brinell hardness minimum of 400. Rating must be furnished with the bid.
4. Lengths, as noted on the proposal, shall not vary more than $\pm 1/8$ " specified in order to fit total moldboard length in various combinations.
5. Bidder must specify delivery dates.

GRADER CUTTING EDGES:

1. Size to be: Minimum wearing edge : "thick x 8" height x the designated length
2. Curved.
3. Painted.
4. Standard AASHTO punching.
5. If available, manufacturer's name, trademark, or identifying part number to be stamped in the non-wear area for warranty claim abilities.
6. Warranty replacement for breakage 2 for 1.

REFERENCE ATTACHMENT A DRAWING

BIDDER

KUEPER NORTH AMERICA

**THRU-HARDENED STEEL MOTOR GRADER EDGES
5/8" BOLT & HOLE PUNCH (unless noted otherwise)**

Detailed Specifications	Unit Price Each
5/8" x 8" Grader Through Hardened – 5FT NDDOT P/N 76006-361646	
FOB ANY NDDOT District	\$ No Bid
5/8" x 8" Grader Through Hardened – 6FT NDDOT P/N 76006-361653	
FOB ANY NDDOT District	\$ No Bid
5/8" x 8" Grader Through Hardened – 7FT NDDOT P/N 76006-361778	
FOB ANY NDDOT District	\$ No Bid
5/8" x 8" Grader Through Hardened – 8FT NDDOT P/N 76006-361786	
FOB ANY NDDOT District	\$ No Bid
1/2" x 8" Grader Through Hardened - 6FT-6FT 11" NDDOT P/N 76006-361661	
FOB ANY NDDOT District	\$ No Bid
1/2" x 8" Grader Through Hardened - 7FT-7FT 11" NDDOT P/N 76006-361752	
FOB ANY NDDOT District	\$ No Bid
1/2" x 8" Grader Through Hardened - 8FT-8FT 11" NDDOT P/N 76006-361794	
FOB ANY NDDOT District	\$ No Bid

BRAND NAME: N/A

MANUFACTURER: N/A

INITIAL ORDER DELIVERY DAYS ARO N/A

DELIVERY FOR REORDERS N/A

BIDDER KUEDER NORTH AMERICA

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
SPECIFICATIONS FOR
PREMIUM SECTIONAL TUNGSTEN CARBIDE-TIPPED CUTTING EDGES
SNOWPLOW AND UNDERBODY SCRAPER

Similar or equal to Kueper Premium Carbide Insert Snowplow Blade

BLADE

1. The blades shall be SAE1045 steel.
2. The blades shall be fabricated in various sections to provide the lengths indicated on the bid sheet, and shall be manufactured in accordance with the dimensions detailed in ATTACHMENT B.
3. Hole-punching shall be $1\frac{1}{16}$ " square, countersunk to receive $\frac{5}{8}$ " diameter plow bolts. The hole spacing shall be as per AASHTO standards.
4. The finished blade sections shall be given one coat of rust resistant lacquer.
5. The finished blade sections shall be free of warpage, with the longitudinal deviation not to exceed $\frac{1}{8}$ " in a four-foot section.
6. The complete cutting edge shall consist of a combination of sections, with the two end sections interchangeable.

TUNGSTEN CARBIDE INSERTS

1. The inserts shall be high grade tungsten carbide with 10-12 percent cobalt content. The tungsten carbide shall be new. No reclaimed tungsten carbide will be allowed.
2. The density shall be in the range of 14.1 to 14.6.
3. The hardness shall be in the range of 88 minimum to 93 maximum Rockwell A scale.
4. The transverse rupture strength of the carbide shall be 350,000 psi minimum.
5. The sections shall essentially have 1" of tungsten per each 1" of section. A carbide analysis certification shall be submitted with each bid.
6. Dimensions of insert shall be 0.69" height, 0.30" width, and 1" nominal length.

BRAZING

1. Brazing is required on all contact surfaces.
2. The braze material shall have a shear strength of 30,000 psi.

SPECIFIC REQUIREMENTS

1. If supplying a product equivalent to Kueper Premium Carbide Insert Snowplow Blades, **literature must be provided.**
2. The supplier shall provide written certification that states the cutting edges shipped meet all the requirement contained in the specification.
3. Materials and assembly shall be guaranteed with replacement against breakage and brazing failure, as well as satisfactory performance under normal cold weather snow and ice removal operations.

BIDDER

KUEPER NORTH AMERICA

Detailed Specifications	Unit Price Each
Premium Sectional Tungsten Carbide Tipped Cutting Edges Snowplow and Underbody Scraper – 3FT NDDOT P/N 76006-366505	
FOB ANY NDDOT District	\$ 8192.00
Premium Sectional Tungsten Carbide Tipped Cutting Edges Snowplow and Underbody Scraper – 4FT NDDOT P/N 76006-366510	
FOB ANY NDDOT District	\$ 8256.00

BRAND NAME: KUEPER PREMIUM CARBIDE SNOWPLOW BLADE

MANUFACTURER: KENAMETAL

INITIAL ORDER DELIVERY DAYS ARO 30

DELIVERY FOR REORDERS 21 DAYS

BIDDER _____

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
SPECIFICATIONS FOR
SECTIONAL TUNGSTEN CARBIDE-TIPPED CUTTING EDGES
SNOWPLOW, MOTOR GRADER, AND UNDERBODY SCRAPER

BLADE:

1. The blades shall be SAE 1020-1045 steel.
2. The blades shall be fabricated in various sized sections to provide the lengths indicated on the bid sheet, and shall be manufactured in accordance with the dimensions detailed in ATTACHMENT B.
3. Hole-punching shall be $1\frac{1}{16}$ " square, countersunk to receive $\frac{5}{8}$ " diameter plow bolts or $1\frac{3}{16}$ " square, countersunk to receive $\frac{3}{4}$ " diameter plow bolts. The hole spacing shall be as per AASHTO standards.
4. The finished blade section shall be given one coat of rust resistant lacquer.
5. The finished blade sections shall be free of warpage, with the longitudinal deviation not to exceed $\frac{1}{8}$ " in a four-foot section.
6. The complete cutting edge shall consist of a combination of sections, with the two end sections interchangeable.

TUNGSTEN CARBIDE INSERTS:

1. The inserts shall be a high W.C. grade of tungsten carbide with 11 to 13 percent cobalt content. The tungsten carbide shall be new; no reclaimed tungsten carbide may be used.
2. The density shall be in the range of 14.1 to 14.6.
3. The hardness shall be in the range of 87.5 minimum to 89.0 maximum Rockwell "A" scale.
4. The transverse rupture strength of the carbide shall be 350,000 psi minimum.
5. The insert shall be 1" nominal length.
6. The sections shall essentially have 1" of tungsten per each 1" of section. A carbide grade analysis certification shall be submitted with each bid.
7. Carbide inserts shall extend a minimum of .010" and a maximum of .040" beyond the leading edge of the blade.
8. Carbide inserts shall be 25-degree trap and $\frac{3}{4}$ " height.
9. The supplier shall furnish the Central Office with a certified test result of Rockwell Hardness, Transverse Rupture Strength, Density, and Cobalt Content for each cemented carbide lot or batch, used in fabricating the cutting edges. Each test sample shall meet the specified physical requirements.

BRAZING:

1. The braze material strength shall have a minimum tensile strength of 30,000 psi.
2. The braze (weld) shear stress in tension to the tungsten carbide insert and the blade base material shall have a minimum shear strength of 25,000 psi.
3. The inserts shall be brazed on all sides consistent with sound brazing practice, with no evidence of voids, pin holes, or use of shims.
4. A loss of 6" or more of tungsten carbide inserts per cutting edge during normal usage shall be considered brazing failure.

BIDDER

KUEPER NORTH AMERICA

ITB 760-06-20-050, Cutting Edges
Page 16 of 29

SPECIFIC REQUIREMENTS

1. The supplier shall also provide written certification that states the cutting edges shipped meet all the requirements contained in the specification.
2. Materials and assembly shall be guaranteed with replacement against breakage and brazing failure, as well as satisfactory performance under normal cold weather snow and ice removal operations.

REFERENCE ATTACHMENT B DRAWING

BIDDER KUEDER NORTH AMERICA

**SECTIONAL TUNGSTEN CARBIDE TIPPED SNOWPLOW CUTTING EDGES
5" HEIGHT, 5/8" BOLT & HOLE PUNCHING**
Please provide a delivered price for every line.

BRAND NAME: KENAMETAL		
MANUFACTURER: KENAMETAL		
District	Length NDDOT Part Number	Price Per Lineal Foot
Bismarck, ND 58504	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Valley City, ND 58072	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Devils Lake, ND 58301	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Minot, ND 58701	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Dickinson, ND 58601	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Grand Forks, ND 58208	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Williston, ND 58802	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Fargo, ND 58103	3FT 76006-365597	\$ 69.70
	4FT 76006-365662	\$ 69.70
Delivery Days After Receipt of Order: <u>45</u> Days		
Minimum order quantity: <u>120</u> LF		

BIDDER KUEPER NORTH AMERICA

SECTIONAL TUNGSTEN CARBIDE TIPPED UNDERBODY SCRAPER CUTTING EDGES

Please provide a delivered price for every line.

BRAND NAME: <u>KENAMETAL</u>		
MANUFACTURER: <u>KENAMETAL</u>		
5" HEIGHT, 5/8" HOLE-PUNCHING		
District	Length NDDOT Part Number	Price Per Lineal Foot
Bismarck, ND 58504	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
Valley City, ND 58072	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
	5FT 76006-366157	\$ <u>74.80</u>
Devils Lake, ND 58301	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
	5FT 76006-366157	\$ <u>74.80</u>
Minot, ND 58701	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
Dickinson, ND 58601	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
	5FT 76006-366157	\$ <u>74.80</u>
Grand Forks, ND 58208	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
Williston, ND 58802	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
Fargo, ND 58103	3FT 76006-366009	\$ <u>74.80</u>
	4FT 76006-366108	\$ <u>74.80</u>
	5FT 76006-366157	\$ <u>74.80</u>
5" HEIGHT, 3/4" HOLE-PUNCHING		
Grand Forks, ND 58208	3FT 76006-366009	\$ <u>84.70</u>
	4FT 76006-366108	\$ <u>84.70</u>
Delivery Days After Receipt of Order: <u>45</u> Days		
Minimum order quantity: <u>120</u> LF		

BIDDER KUEPER NORTH AMERICA

SECTIONAL TUNGSTEN CARBIDE TIPPED MOTOR GRADER CUTTING EDGES

Please provide a delivered price for every line.

BRAND NAME: <u>KENAMETAL</u>		
MANUFACTURER: <u>KENAMETAL</u>		
8" HEIGHT, 5/8" HOLE-PUNCHING		
District	Length NDDOT Part Number	Price Per Lineal Foot
Bismarck, ND 58504	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
Valley City, ND 58072	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
Devils Lake, ND 58301	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
Minot, ND 58701	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
Dickinson, ND 58601	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
Williston, ND 58802	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
Fargo, ND 58103	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
8" HEIGHT, 3/4" HOLE-PUNCHING		
Grand Forks, ND 58208	3FT 76006-361604	\$ 91.30
	4FT 76006-361638	\$ 91.30
Delivery Days After Receipt of Order: <u>45</u> Days		
Minimum order quantity: <u>120</u> LF		

BIDDER KUEPER NORTH AMERICA

**NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
SPECIFICATIONS FOR
THRU-HARDENED STEEL VEE-SNOWPLOW EDGE**

GENERAL SPECIFICATIONS:

1. Cutting edges must be cut in the lengths as specified herein.
2. Cutting edge ends shall be square and cleanly cut.
3. Cutting edges shall be uniformly through hardened to Brinell hardness minimum of 400. Rating must be furnished with the bid. Rating must be furnished with the bid.
4. Lengths, as noted on the proposal, shall not vary more than $\pm 1/8$ " specified in order to fit total moldboard length in various combinations.
5. Bidder must specify delivery dates.
6. Materials and assembly shall be guaranteed with replacement against breakage, as well as satisfactory performance under normal cold weather snow and ice removal operations.

VEE-SNOWPLOW CUTTING EDGES:

1. Sizes and length as designated.
2. Flat.
3. Unpolished.

Brand Name:		
Manufacturer:		
8" HEIGHT X 1/2" THICK		
LENGTH DOT PART NUMBER	ORDER PRICE LINEAL FOOT	
5FT 76006-368005	\$ No Bid	DELIVERY DAYS AFTER RECEIPT OF ORDER <u>N/A</u> Minimum order quantity for this price = <u>N/A</u> LF
6FT 76006-368104	\$ No Bid	
7FT 76006-368153	\$ No Bid	

BIDDER KOEDER NORTH AMERICA

**KUEPER BRAND CUTTING EDGES
 TUCA SX - TUNGSTEN CARBIDE/STEEL VULCANIZED IN RUBBER CUTTING EDGES
 (Or Equal)
 5/8" HOLE PUNCHING – ALL DISTRICTS**

General Specifications:

- Materials and assembly shall be guaranteed with replacement against breakage, as well as satisfactory performance under normal cold weather snow and ice removal operations.

TUCA SX SNOW PLOW CUTTING EDGES			
Please provide a delivered price for every line.			
Delivery Location	Cutting Edge Length Each	NDDOT P/N KUEPER P/N	Price Each FOB Destination
Bismarck, ND 58504	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
Valley City, ND 58072	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
Devils Lake, ND 58301	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
Minot, ND 58701	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
Dickinson, ND 58601	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
Williston, ND 58802	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
Grand Forks, ND 58208	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
Fargo, ND 58103	3 FT	76006-369155 34855836X	\$ 585.00
	4 FT	76006-369177 34855936X	\$ 780.00
TUCA Snowplow "Each" is the cut-to-length edge price for each location and includes freight. Delivery Days After Receipt of Order: <u>10</u> Days Minimum order quantity: <u>11</u> LF			

BIDDER KUEPER NORTH AMERICA

TUCA SX UNDERBODY SCRAPER

DISTRICT	DESCRIPTION	ORDER PRICE LINEAL FOOT
Bismarck, ND 58504	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A
Valley City, ND 58072	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A
Devils Lake, ND 58301	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A
Minot, ND 58701	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A
Dickinson, ND 58601	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A
Grand Forks, ND 58208	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A
Williston, ND 58802	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A
Fargo, ND 58103	3 Ft, Kueper TUCA SX UB 3485583TX	\$ 195.00
	4 Ft, Kueper TUCA SX UB 3485593TX	\$ 195.00
	5 Ft, Kueper TUCA SX UB 3485603TX	\$ N/A
	6 Ft, Kueper TUCA SX UB 3485653TX	\$ N/A

DELIVERY DAYS AFTER RECEIPT OF ORDER 10

Minimum order quantity for this price per part number = 11 LF

BIDDER KUEPER NORTH AMERICA

SNOWPLOW BLADE ISOLATED CARBIDE EDGE CUTTING BLADES (I.C.E.)

BLADE

1. The blade shall be fabricated using flat hot-rolled finished steel to meet or exceed specifications for A36 or 1040 type steels.
2. Punching shall be 11/16" square holes with countersink to receive 5/8" diameter plow bolts. Location and spacing of the holes shall be as specified by the user. For Standard Highway Punch style spacing refer to Attachment B.
3. Center of bolt holes shall be in line within 1/32" of established horizontal centerline and 1/16" of established vertical centerline.

TUNGSTEN CARBIDE INSERTS

1. The inserts shall be a high shock WC grade of tungsten carbide with (10.5 to 12.5) percent cobalt content.
 - a. Density: 13.9 Minimum to 14.6 Maximum
 - b. Hardness: 86.8 Minimum to 89.2 Maximum Rockwell. "A" Scale or Equivalent based on appropriate coercive force correlation.
 - c. The Maximum Allowable Porosity: (Based on testing in accordance with ASTM designation B276-79) shall be:
 - A08
 - B04
 - C00
2. The carbide insert manufacturer to furnish certification to the State Highway Department that the inserts meet the specifications as set forth in 2.1.
3. The inserts shall be a cylindrical design with a dome-shaped end of the following dimensions:
 - a. Height: .753" +/- .007 (long side)
 - b. Diameter: .523" +/- .004
 - c. Bottom Angle: 25 degrees with a nose radius of 1/16" minimum
4. A metallurgical evaluation of the carbide insert shall show no evidence of cross grade contamination. Evaluation to be based on a photomicrograph of a polished and etched specimen at 500x magnification.

BRAZING

1. The brazing material shall be a high strength alloy type.
2. The tungsten carbide inserts shall be positioned in holes drilled in the center of the thickness of the blade and shall be spaced 0.75" center to center along the entire length of each cutting edge section.
3. The inserts shall be brazed on all sides consistent with sound brazing practice with no evidence of voids in the braze joint.

SPECIFIC REQUIREMENTS

1. The finished blade section shall be free of warpage and longitudinal deviation not to exceed 1/8" in a four-foot blade section.
2. Each blade section shall be identified with manufacturer's identification stamp into the metal or on a label in a non-wear area of the blade.
3. Materials and assembly shall be guaranteed with replacement against breakage and brazing failure, as well as satisfactory performance under normal cold weather snow and ice removal operations.

BIDDER

KUEPER NORTH AMERICA

**SECTIONAL TUNGSTEN CARBIDE INSERTED
SNOWPLOW CUTTING EDGES, 5" HEIGHT, 5/8" HOLE-PUNCHING
Kennametal Isolated Carbide-Edge (I.C.E. Series)**

Brand Name: <u>KENAMETAL I.C.E. SERIES</u>	
Manufacturer: <u>KENAMETAL</u>	
Description	PRICE PER LINEAL FOOT
3FT SNOWPLOW CUTTING EDGE and 3FT UNDERBODY SCRAPER CUTTING EDGES <u>Square Top Edge</u> (Kennametal catalog number PB 536, material number 1553693) <u>Beveled Top Edge</u> (Kennametal material number 2035932) NDDOT 76006-653693	\$ <u>76.12</u>
4FT SNOWPLOW CUTTING EDGE and 4FT UNDERBODY SCRAPER CUTTING EDGES <u>Square Top Edge</u> (Kennametal catalog number PB 548, material number 1553694) <u>Beveled Top Edge</u> (Kennametal material number 2035931) NDDOT 76006-654894	\$ <u>75.76</u>
Delivery Days After Receipt of Order: <u>45</u>	
Minimum Order Quantity for price indicated: <u>100</u> LF	

QTY.	ITEM	UNIT PRICE
	KENAMETAL I.C.E. CURB GUARD (Kennametal part number 2040087) BRAND <u>KENAMETAL</u>	
	PART NO. (L) <u>2040087</u>	
	PART NO (R) <u>2040087</u>	
	Delivery Days After Receipt of Order: <u>45</u> Days	Price Each (L): \$ <u>168.48</u>
	Minimum order quantity for this price = <u>1</u> EA	Price Each (R): \$ <u>168.48</u>

BIDDER KUEPER NORTH AMERICA

SPECIFICATIONS FOR STANDARD CURB GUARD

GENERAL SPECIFICATIONS:

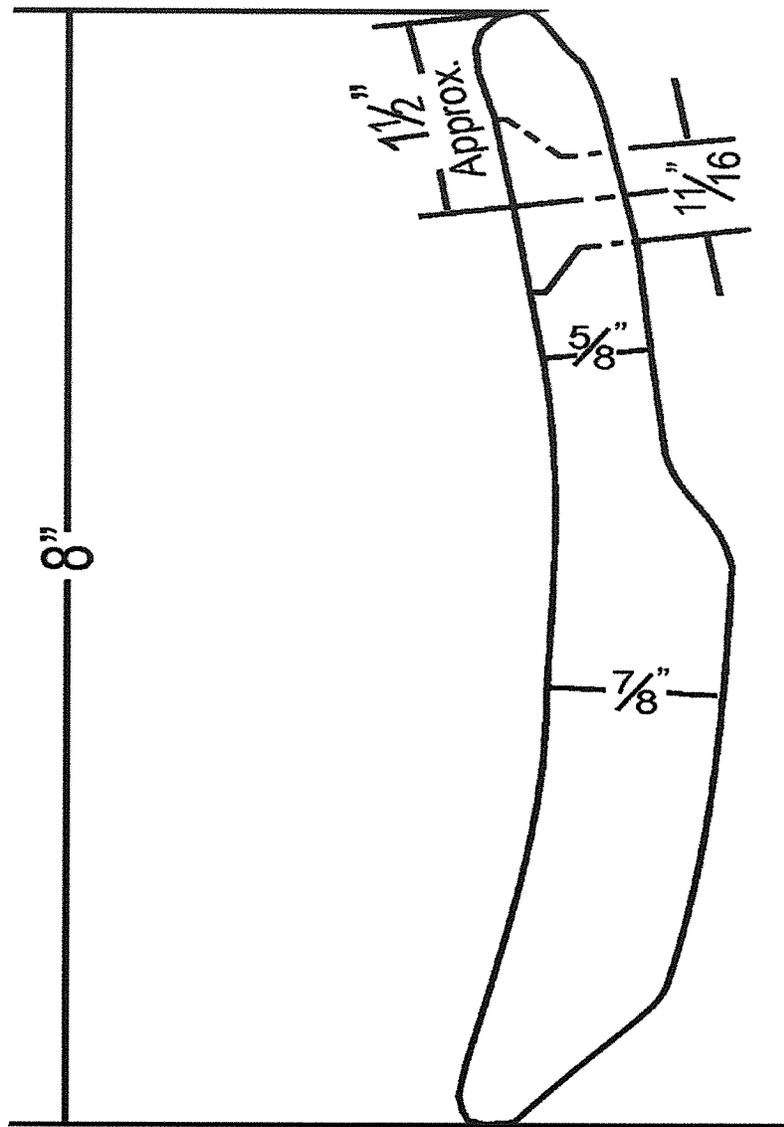
1. The Curb Guards shall be SAE 1020-1045 steel.
2. Hole-punching shall be 1 1/16" square, countersunk to receive 5/8" diameter plow bolts or 13/16" square, countersunk to receive 3/4" diameter plow bolts. The hole spacing shall be as per AASHTO.
3. The finished Curb Guard shall be given one coat of rust resistant lacquer.
4. Must protect moldboard ends from impact.
5. Must list Curb Guard for the left and right side of plow.
6. Must be carbide reinforced.
7. Must provide literature on your Curb Guard.

STANDARD CURB GUARD	
BRAND <u>KEAM METAL</u>	PART NO. (L) <u>101 2592</u>
	PART NO (R) <u>101 2592</u>
Delivery Days After Receipt of Order: <u>45</u> Days	Price Each (L): \$ <u>121.46</u>
Minimum order quantity for this price = <u>1</u> EA	Price Each (R): \$ <u>121.46</u>

BIDDER KUEPER NORTH AMERICA

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

Surface Harden Cutting Edges

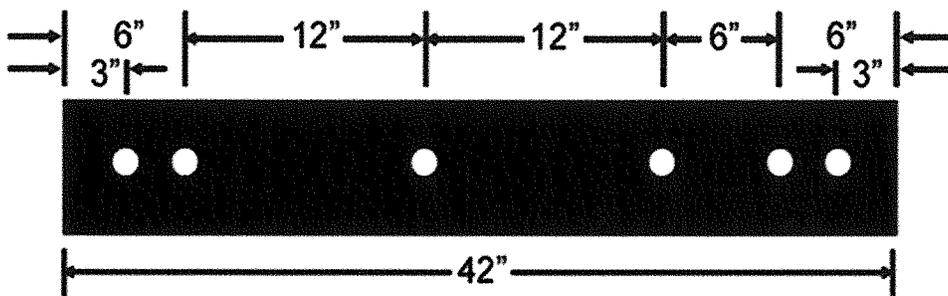
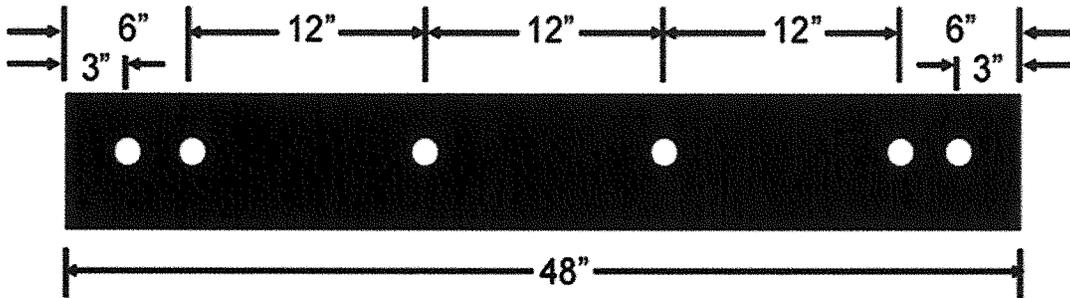
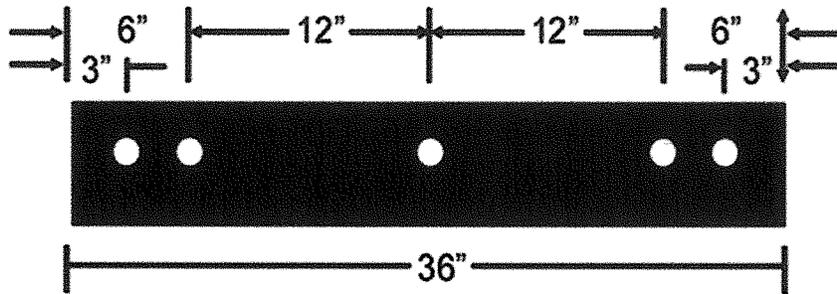


MOTOR GRADER

BIDDER KUEPER NORTH AMERICA

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

PUNCHING SPACE SNOWPLOW CUTTING EDGES



BIDDER Koepen North America

N.D. DEPT. OF TRANSPORTATION - PURCHASING CONTACTS AND SHIP TO ADDRESSES

61 – BISMARCK DISTRICT:

NDDOT - BISMARCK DISTRICT (701) 328-6941
218 S AIRPORT ROAD (701) 328-6933 FAX
BISMARCK ND 58504-6003
MARC REED, STOREKEEPER

62 - VALLEY CITY DISTRICT:

NDDOT - VALLEY CITY DISTRICT (701) 845-8803
1524 8TH AVENUE SW (701) 845-8804 FAX
VALLEY CITY ND 58072-4200
RENEE HAZELTON, STOREKEEPER

63 - DEVILS LAKE DISTRICT:

NDDOT - DEVILS LAKE DISTRICT (701) 665-5119
316 6TH ST SE (701) 328-0329 FAX
DEVILS LAKE ND 58301
LISA VETSCH, STOREKEEPER

64 –MINOT DISTRICT:

NDDOT - MINOT DISTRICT (701) 857-6928
1305 HIGHWAY 2 BYPASS EAST (701) 857-6932 FAX
MINOT ND 58701-7922
LINDA KILLMER, STOREKEEPER

65 –DICKINSON DISTRICT:

NDDOT - DICKINSON DISTRICT (701) 227-6525
1700 3RD AVENUE W SUITE 101 (701) 227-6505 FAX
DICKINSON ND 58601-3009
SHARON PRIVRATSKY, STOREKEEPER

66 -GRAND FORKS DISTRICT:

NDDOT - GRAND FORKS DISTRICT (701) 787-6521
1951 NORTH WASHINGTON (701) 787-6515 FAX
PO BOX 13077
GRAND FORKS ND 58208-3077
GEORGE PALO, STOREKEEPER

67 –WILLISTON DISTRICT:

NDDOT - WILLISTON DISTRICT (701) 774-2721
605 DAKOTA PARKWAY WEST (701) 774-2704 FAX
PO BOX 698
WILLISTON ND 58802-0698
SUSAN PERCOSKI, STOREKEEPER

68 –FARGO DISTRICT:

NDDOT - FARGO DISTRICT (701) 239-8910
503- 38TH STREET SOUTH (701) 239-8915 FAX
FARGO ND 58103-1198
JONATHON LEE, STOREKEEPER

BIDDER

KOEPEL NORTH AMERICA

**NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPENDIX A OF THE TITLE VI ASSURANCES**

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the Contractor) agrees as follows:

1. Compliance with Regulations: The Contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, the Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. Non-discrimination: The Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. Information and Reports: The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the Recipient or the Federal Highway Administration as appropriate, and will set forth what efforts it has made to obtain the information.
5. Sanctions for Noncompliance: In the event of a contractor's noncompliance with the Nondiscrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
 - a. withholding payments to the Contractor under the contract until the Contractor complies; and/or
 - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. Incorporation of Provisions: The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.



**NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPENDIX E OF THE TITLE VI ASSURANCES**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the Contractor) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 *et seq.*).



Risk Management Appendix

Supply Contracts with Private Individuals, Companies, Corporations, Etc.:

Each party agrees to assume its own liability for any and all claims of any nature including all costs, expenses and attorney's fees which may in any manner result from or arise out of this agreement.

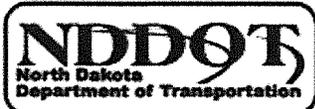
Contractor, or Contractor's delivery agent, shall secure and keep in force during the term of this agreement, from insurance companies, government self-insurance pools or government self-retention funds authorized to do business in North Dakota, the following insurance coverages:

- 1) **Commercial general liability and automobile liability** insurance.
- 2) **Workers compensation** insurance.

Contractor shall produce certificates of insurance or copies of insurance policies upon request by the State.

When a portion of a Contract is sublet, the Contractor shall obtain insurance protection (as outlined above) to provide liability coverage to protect the Contractor and the State as a result of work undertaken by the Subcontractor. In addition, the Contractor shall ensure that any and all parties performing work under the Contract are covered by public liability insurance as outlined above. All Subcontractors performing work under the Contract are required to maintain the same scope of insurance required of the Contractor. The Contractor shall be held responsible for ensuring compliance with those requirements by all Subcontractors.

RM Consulted 2007
Revised 6-07



Amendment No. 1

To: ALL INTERESTED SUPPLIERS
From: North Dakota Department of Transportation
Date: August 5, 2020
Re: Amendment to ITB 760-06-20-050, Cutting Edges

Bidders Instruction #11 of the solicitation established a deadline for receipt of questions. The responses to these questions are provided as addenda to the solicitation. When necessary, the solicitation has been amended.

Question 1:

Can you please provide blade thickness for the sectional tungsten carbide blades?

Answer 1:

The minimum blade thickness should be 7/8".
The bid is hereby amended.

Question 2:

Can you provide information on estimated quantities of each item ordered by each shop?

Answer 2:

Total quantities for each district shop have not been broken down. Amendment, Page 3 of 3 lists total units purchased by the agency from 08/01/2019 – 07/31/2020.
The bid is hereby amended.

Question 3:

We would like to be able to submit bids for Lake Effect and Ice O Force HD, as well as the Joma and carbide blades listed in the bid. Would it be possible to bid these as alternatives or to have them added by addendum?

Answer 3:

NDDOT is not ready to add new items to the bid at this time. Bidders may offer alternatives and must include product literature with the bid. NDDOT would assess the literature to determine equivalency. If it is determined that the alternate product is equivalent, Maintenance would be willing to test the edges to further support equivalency.
The bid is hereby amended.

Question 4:

Would you consider adding the following requirement to the specification on pages 14 and 15 of the solicitation, pertaining to NDDOT P/N 76006-366505 & 76006-366510?

The inserts shall include and be manufactured with and be manufactured with small protrusions (on either abutting end) that maintain a precise gap between the inserts so that molten braze may flow between inserts consistently and effectively.

Answer 4:

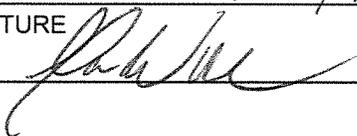
The specifications will not be changed at this time.
No amendment necessary.

Vendors are instructed to acknowledge receipt of and compliance with this amendment by signing below and returning this acknowledgement with your bid or proposal.

Any questions regarding this amendment must be submitted in writing to the undersigned Procurement Officer.

Vanessa Brosten, Procurement Officer
PHONE: 701-328-4466
E-MAIL: vbrosten@nd.gov

By my signature below, I hereby acknowledge receipt of and compliance with this amendment to the above referenced solicitation.

COMPANY NAME KUEPER NORTH AMERICA	
PRINTED NAME OF BIDDER OR OFFEROR <u>and</u> TITLE GARDNER WILLIS, MANAGING PARTNER	
SIGNATURE 	DATE 8/10/2020

Orders Placed 08/01/2019 – 07/31/2020

5/8"x6" Polar Flex XWS-12 Adap-76006-367500	96	Units
Back Support, 3' BS 23902 JOMA-76006-367011	8	Units
Back Support, 4' BS23901 JOMA-76006-367010	32	Units
Edge, 3 Ft, Kueper TUCA 34855836X-76006-369155	49	Units
Edge, 3 Ft, Underbody Kueper Tuca SX-76006-369199	98	Units
Edge, 4 Ft, Kueper TUCA SX 34855936X-76006-369177	199	Units
Edge, 4 Ft, Underbody Kueper Tuca SX-76006-369188	185	Units
Edge, Grader, 3 Ft, 8, Tungste-76006-361604	41	Units
EDGE, GRADER, 3FTX6INX1/2IN,-76006-361513	6	Units
Edge, Grader, 4 Ft, 8, Tungste-76006-361638	30	Units
EDGE, GRADER, 4FTX6INX1/2IN,-76006-361521	11	Units
Edge, Grader, 7 Ft, Hardened,-76006-361778	2	Units
Edge, Rubber, 3' JOMA 6000-76006-367006	51	Units
Edge, Rubber 4' JOMA 6000-76006-367005	335	Units
Edge, Scraper/Grader, 3 Ft, Tu-76006-366009	246	Units
Edge, Scraper/Grader, 4ft , Tu-76006-366108	450	Units
Edge, Scraper/Grader, 5 Ft, Tu-76006-366157	46	Units
Edge, Snow Plow, 3 Ft, Tungste-76006-365597	62	Units
Edge, Snow Plow, 4 Ft, Tungste-76006-365662	76	Units
Edge, Snowplow/Underbody Scraper, premium tungsten 3 ft-76006-366505	35	Units
Edge, Snowplow/Underbody Scraper, premium tungsten 4 ft-76006-366510	89	Units



North Dakota Dept. of Transportation
Procurement Section
608 E. Boulevard Ave.
Bismarck, ND 58505-0700

August 10, 2020

RE: Bid Number 760-06-20-050

To Whom It May Concern:

Kueper North America, LLC certifies that all cutting edges that will be shipped on bid 760-06-20-050 meet all requirements contained in the specifications.

Sincerely,

A handwritten signature in black ink, appearing to read "Gardiner Willis", is written over a white background.

Gardiner Willis
Managing Partner



**KENNAMETAL
CONFORMANCE CERTIFICATE
FOR MATERIAL BID**

We hereby certify that all materials used in the manufacturing of parts called for on

Bid Number: 760-060-20-050

Dated: July 24, 2020

Received by us from: North Dakota Dept of Transportation

Conform to the material and/or manufacturing specifications indicated on the drawing or specifications as called for on the said bid.

Furthermore, we certify the Kennametal grade K3030C carbide used in the manufacture of these products will conform to the following:

Cobalt = 11% to 12%

Density = 14.1 MIN to 14.6 MAX

Hardness = 88 to 93 Rc. "A" Scale

Transverse Rupture Strength shall be 350,000 PSi minimum

**KENNAMETAL INC.
BEDFORD, PA**

A handwritten signature in black ink, appearing to read 'C. Ritchey', written over the printed name.

**Cary D. Ritchey
Sales Manager – Specialty Products**



KENNAMETAL INC.
MINING AND CONSTRUCTION DIVISION

RECOMMENDED SPECIFICATIONS FOR
7/8 x 5 SIZE SECTIONAL PREMIUM TUNGSTEN CARBIDE TIPPED
SNOWPLOW BLADE CUTTING EDGES (BLADES)

The following specifications are the result of years of constant field research and development. These revised specifications help assure State and Municipal Highway Departments of a quality product when procuring carbide tipped snowplow blades.

1. **BLADE**

- 1.1 The blade shall be flat hot-rolled finished steel to meet or exceed specifications for 1040 type steels.
- 1.2 Punching shall be 11/16" square holes with countersink to receive 5/8" diameter plow bolts. Location and spacing of the holes shall be as specified by the user.
- 1.3 The groove for the carbide inserts shall be milled on the blade edge in accordance with attached drawing
- 1.4 Center of holes shall be in line within 1/32" of established horizontal centerline and 1/16" of established vertical centerline.

2. **TUNGSTEN CARBIDE INSERTS**

- 2.1 The inserts shall be a high shock WC grade of tungsten carbide with (11 to 12) percent cobalt content.

Density: 14.1 Minimum to 14.6 Maximum

Hardness: 88 Minimum to 93 Maximum

Rc. "A" Scale

Transverse Rupture Strength (p.s.i): 350,000 Minimum

Porosity: (Based on testing in accordance with ASTM designation B276-79)

A06

B02

C00



- 2.2 The carbide insert manufacturer to furnish certification to the State Highway Department that the inserts meet the specifications as set forth in 2.1.
- 2.3 The inserts shall be a bullnose design of the following dimensions:
 - Height: .690" +/- .005 (long side)
 - Width: .300" +/- .010
 - Length: 1" Nominal
 - Nose Radius: 0.15"
- 2.4 A metallurgical evaluation of the carbide insert shall show no evidence of cross grade contamination. Evaluation to be based on a photomicrograph of a polished and etched specimen at 500x magnification.

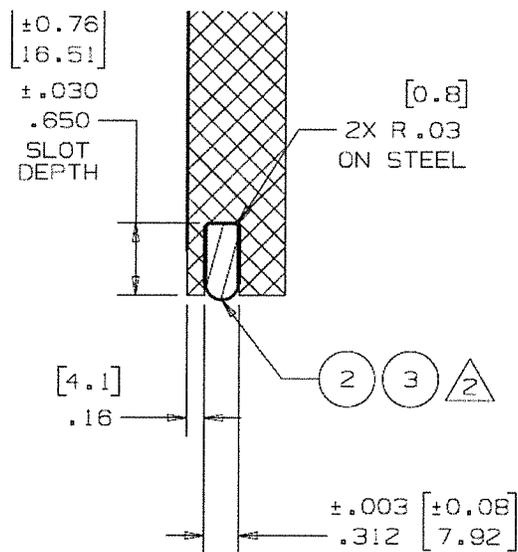
3. BRAZING

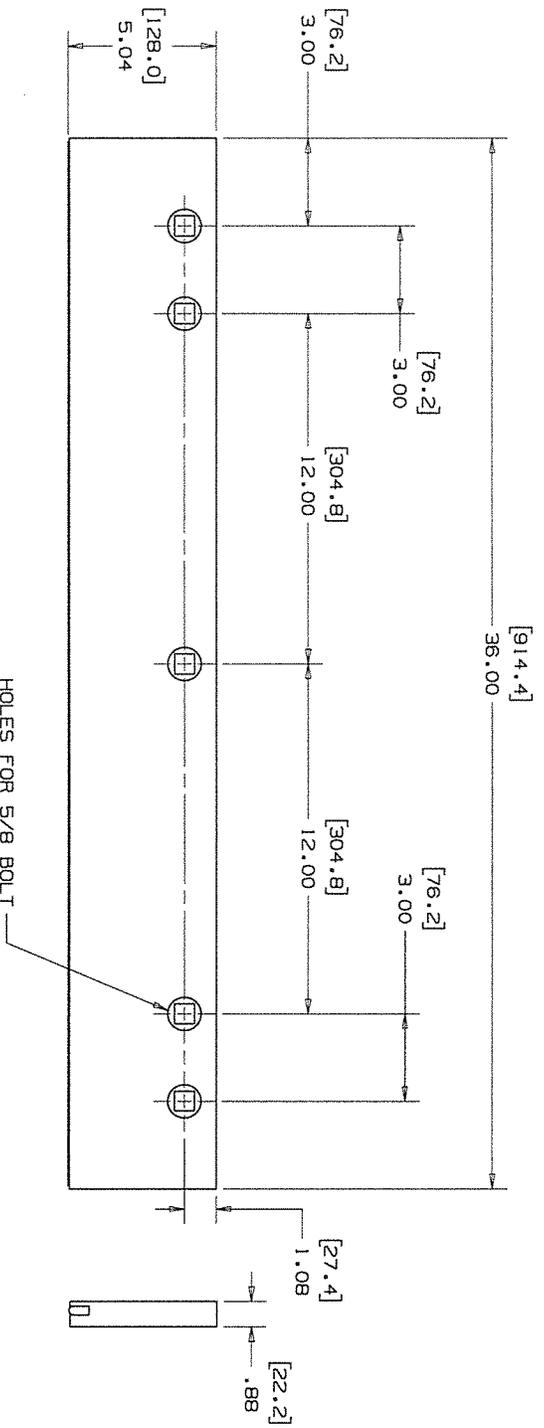
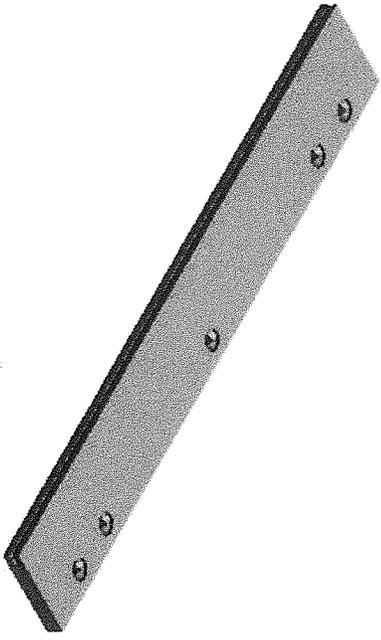
- 3.1 The brazing material shall be a high strength alloy type.
- 3.2 The tungsten carbide inserts shall be positioned in the milled groove at approximately .010 between the inserts the entire length of each cutting edge section.
- 3.3 The inserts shall be brazed on all sides consistent with sound brazing practice with no evidence of voids or use of shims.
- 3.4 Each blade section to contain one insert, one inch nominal length for each inch of blade section length. Due to the thickness of the braze joints between inserts it may be necessary for several inserts to be slightly shorter or longer than the nominal 1" length to insure the carbide insert runs the entire length of the blade without protruding from the end of the steel body.

4. SPECIFIC REQUIREMENTS

- 4.1 The difference between the highest and lowest tip point (on any two adjacent inserts) not to exceed 1/32" on any given blade assembly.
- 4.2 The finished blade section shall be free of warpage and longitudinal deviation not to exceed 1/8" in a four-foot blade section.
- 4.3 Each blade section shall be identified with manufacturer's identification stamp.
- 4.4 The finished blade sections shall have marking showing the front edge of the blade to avoid improper mounting.

Groove machining from section 1.3





SAP# 6603946

7	B
EN NUMBER	EN DESCRIPTION
1222096	
CHG DESCRIPTIONS	

MATERIAL	GRADE
THIRD ANGLE PROJECTION	
(MILLIMETERS) INCHES	

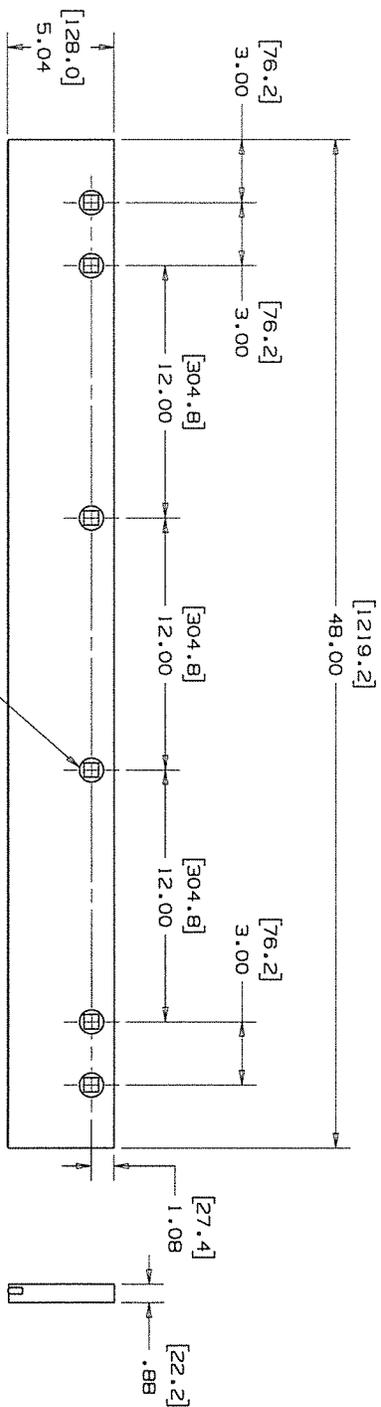
NOTICE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL CORPORATION AND TRADE SECRET INFORMATION AND INTENDS TO BE USED FOR THE PURPOSE OF THE REPRODUCTION, DISTRIBUTION, OR SALE OF THIS DRAWING AS WELL AS THE COMMUNICATION OF ANY OF ITS CONTENTS TO ANY OTHER PERSON WITHOUT THE WRITTEN AUTHORIZATION OF KENNAMETAL CORPORATION.



KBN88536-108G3172A
KUEPER BULL NOSE
BLADE ASSEMBLY - 3FT
ASSEMBLY

Dr-wm	KENNEDJ	2018-08-23	Scale
Checked	KENNEDJ	2018-08-24	NONE
Approved	KENNEDJ	2018-08-24	
Cust. Part#			
Cust. Dwg. #			
Order No.			
Reference			

Type PRODUCT	Sheet 1 of 1
DRAWING NUMBER	VER. Dwg SIZE
61363634.001	04 A3



CHG DESCRIPTIONS	
ER NUMBER	ER DESCRIPTION
1222096	

MATERIAL: GRADE

THIRD ANGLE PROJECTION

(MILLIMETERS)
INCHES

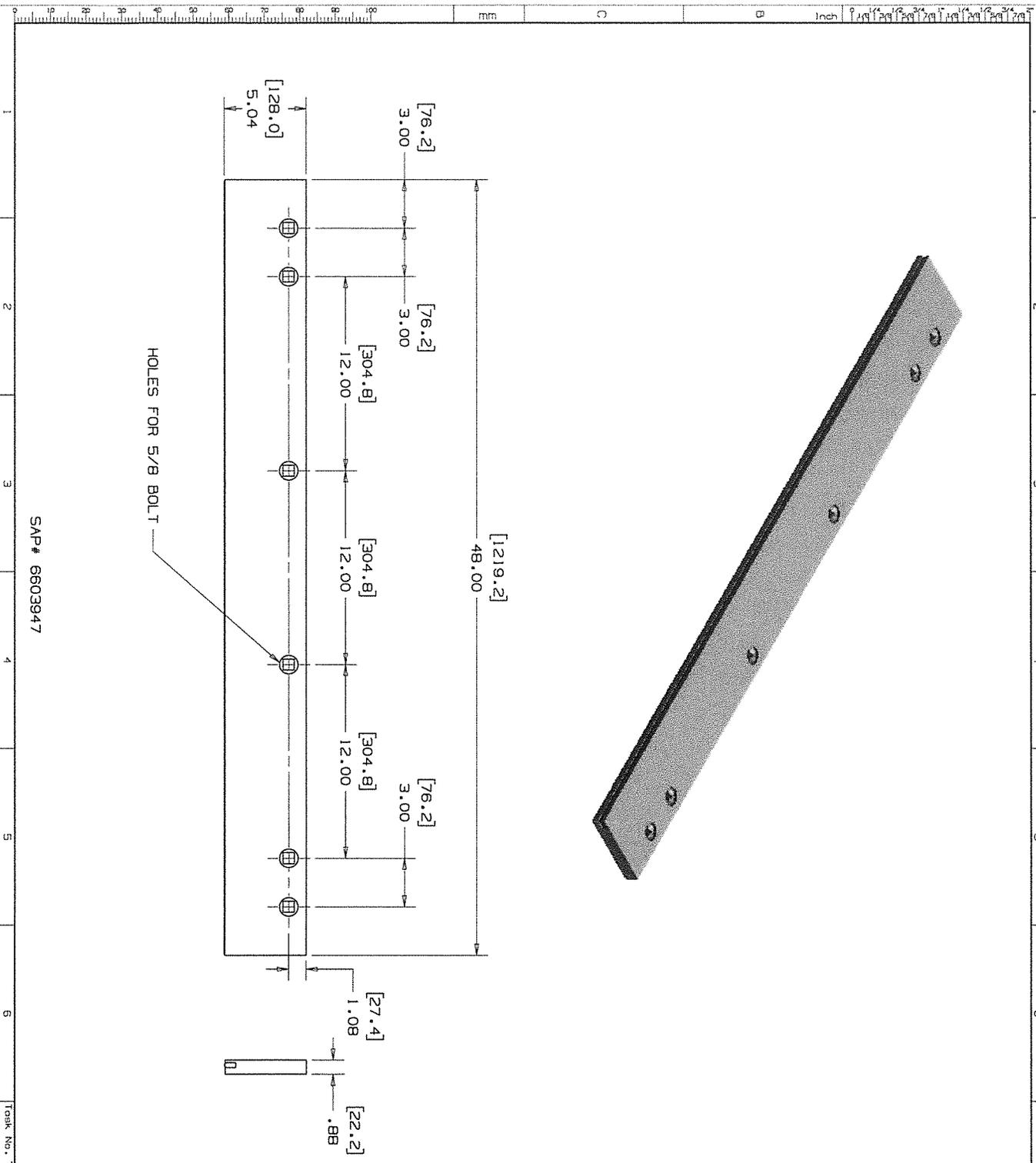
NOTICE: THIS DRAWING IS THE PROPERTY OF KENAMETAL. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF KENAMETAL. YOU IN CONTRACTOR'S OFFICE FOR SPECIFIC PURPOSES AND YOU WILL BE USED FOR THAT PURPOSE. THE REPRODUCTION, DISTRIBUTION, OR USE OF THIS DRAWING IN PART OR AS WELL AS THE COMMUNICATION OF ANY OF ITS CONTENTS TO OTHERS WITHOUT THE WRITTEN PERMISSION OF KENAMETAL IS PROHIBITED. ALL RIGHTS RESERVED.



KBN88548-108G312A
KUEPER BULL NOSE
BLADE ASSEMBLY - 4FT
ASSEMBLY

Drawn	KENNDJ	2018-09-23	Scale
Checked	KENNDJ	2018-09-24	NONE
Approved	KENNDJ	2018-09-24	
Cust. Part #			
Cust. Dwg. #			
Order No.			
Reference			

Type	PRODUCT	Sheet 1 of 1
DRAWING NUMBER	61363471.001	VER. 04
		SIZE A3

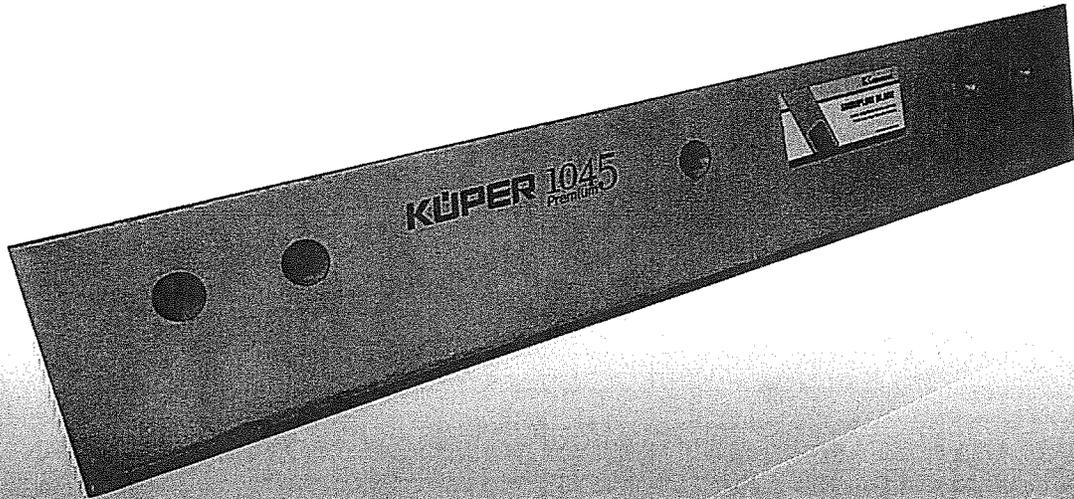


SAP# 6603947

Tank No. T894088

KÜPER®

Kueper Premium Carbide Blades by Kennametal



Kueper Premium Carbide Insert Snowplow Blade

Kueper by Kennametal snowplow blades are constructed of AISI-SAE 1045 steel, with wear resistant, high quality tungsten carbide inserts. Available in 3' or 4' lengths, and made for all types of snowplows and road surfaces.

Snowplow blades with tungsten carbide inserts

Kueper by Kennametal tungsten carbide blades are specifically designed for a variety of plowing applications.

Kueper by Kennametal uses premium Kennametal tungsten carbide, ensuring high durability and fracture resistance. Combined with high quality steel, Kueper by Kennametal blades provide an excellent match for modern snowplow technology.

A high degree of efficiency is guaranteed through the balance of wear between the tungsten carbide and the steel body, thus insuring the complete use of the tungsten carbide inserts in each snowplow blade.

Resulting in quality, time and cost advantages.

Durability

Kueper by Kennametal high quality carbide snowplow blades.

High quality tungsten carbide and consistent brazing technology ensures top performance and longevity up to two times that of normal carbide blades.

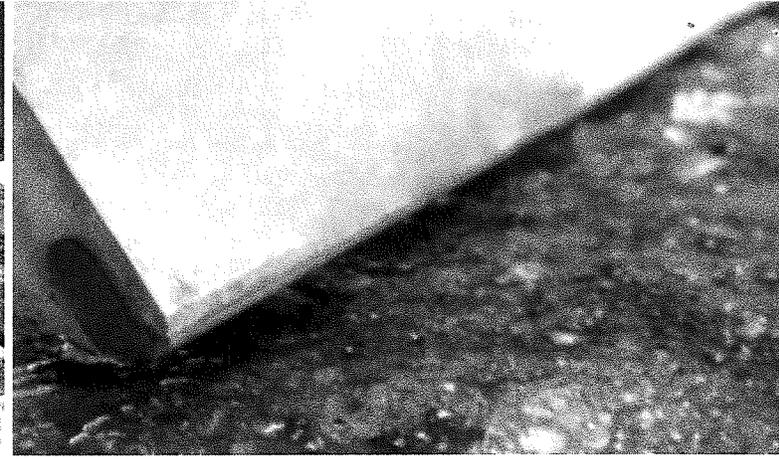
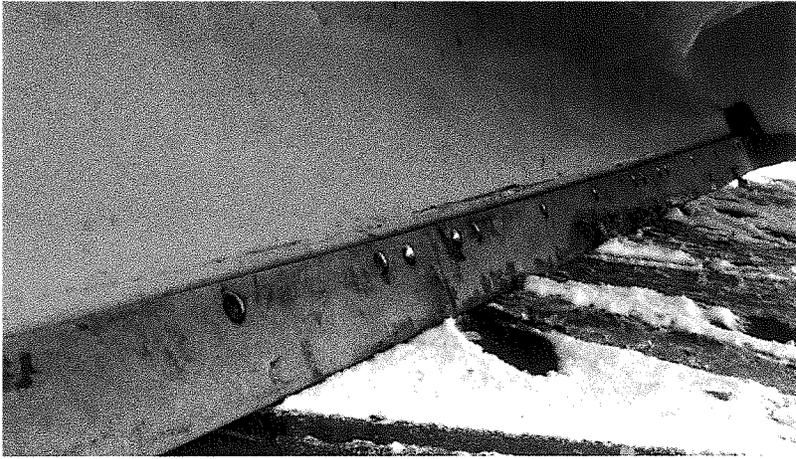
+175%

Kennametal – Basic facts:

- ✓ Oldest and largest US supplier of premium carbide.
- ✓ Kennametal is one of the foremost global manufacturers of wear parts incorporating tungsten carbide.
- ✓ Tools are engineered and produced in the Bedford, PA, USA

Standard Carbide

Kueper by Kennametal Carbide



Steel

AISI-SAE 1045

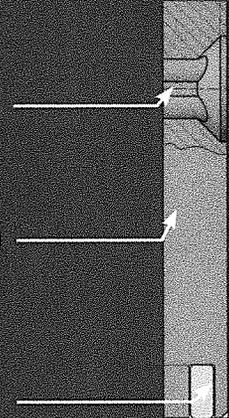
Tungsten Carbide

A chemical compound consisting of equal parts tungsten and carbon. It is characterized by its extreme hardness, which is nearly as high as that of diamonds. This material stands up to the toughest loads.

Countersunk $\frac{5}{8}$ " Hole

1045 Steel

Tungsten Carbide Insert



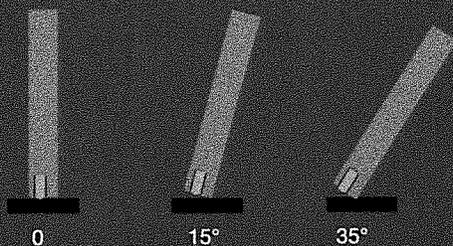
Technology

The companies developed special brazing techniques in order to ensure a permanent connection between the two materials, which is critical to insure maximized tool life. The production process is controlled using strict criteria and in-process inspection and analysis. For instance, the braze joint quality is checked by means of shear resistance.

These extra efforts pay off in the field of application. During operation, the blades heat up tremendously. Tungsten carbide and steel have different thermal characteristics. This causes enormous nominal tensile stress within the blade when in use.

To counteract this, we employ a special brazing material that resists and absorbs these resultant tensile stresses.

Mounting and Operating Instructions



- Use only grade 8 counter sunk carriage bolts and appropriate grade 8 locking hardware
- Torque to 150 foot pounds maximum
- May be used at any angle of operation between 0 and 35 degrees

Areas of use



Motorway



Country road



City

Kueper North America, LLC, 171 Church Street, Suite 300
Charleston, SC 29401, info@kueperblades.com

843.345.6788
www.kueperblades.com



**KENNAMETAL
CONFORMANCE CERTIFICATE
FOR MATERIAL BID**

We hereby certify that all materials used in the manufacturing of parts called for on

Bid Number: 760-06-20-050
Dated: July 24, 2020
Received by us from: North Dakota Dept of Transportation

Conform to the material and/or manufacturing specifications indicated on the drawing or specifications as called for on the said bid.

Furthermore, we certify the Kennametal grade K3030C carbide used in the manufacture of these products will conform to the following:

Cobalt = 11% to 12½%

Density = 14.1 MIN to 14.6 MAX

Hardness = 87.8 to 88.4 Rc. "A" Scale

Transverse Rupture Strength shall be 350,000 PSi minimum

**KENNAMETAL INC.
BEDFORD, PA**

A handwritten signature in black ink, appearing to read 'C. Ritchey', written over the printed name.

**Cary D. Ritchey
Sales Manager – Specialty Products**



KENNAMETAL INC.
MINING AND CONSTRUCTION DIVISION

RECOMMENDED SPECIFICATIONS FOR
7/8" THICK SECTIONAL TUNGSTEN CARBIDE TIPPED
SNOWPLOW BLADE CUTTING EDGES (BLADES) WITH
3/4" HIGH TRAPEZOID INSERTS

The following specifications are the result of years of constant field research and development. These revised specifications help assure State and Municipal Highway Departments of a quality product when procuring carbide tipped snowplow blades.

1. BLADE

- 1.1 The blade shall be flat hot-rolled finished steel to meet or exceed specifications for SAE 1040 -1045 type steels.
- 1.2 Punching shall be 11/16" square holes with countersink to receive 5/8" diameter plow bolts. Location and spacing of the holes shall be as specified by the user.
- 1.3 The groove for the carbide inserts shall be milled in the center of the blade edge.
- 1.4 Center of holes shall be in line within 1/32" of established horizontal centerline and 1/16" of established vertical centerline.

2. TUNGSTEN CARBIDE INSERTS

- 2.1 The inserts shall be a high shock WC grade of tungsten carbide with (11 to 12½) percent cobalt content.

Density: 14.1 Minimum to 14.6 Maximum

Hardness: 87.5 Minimum to 89.0 Maximum
Rc. "A" Scale



Transverse Rupture Strength (p.s.i): 350,000 Minimum

Porosity: (Based on testing in accordance with ASTM designation B276-79)

A06

B02

C00

2.2 The carbide insert manufacturer to furnish certification to the State Highway Department that the inserts meet the specifications as set forth in 2.1.

2.3 The inserts shall be a trapezoid design of the following dimensions:

Height: .750" +/- .005 (long side)

Width: .365" +/- .010

Length: 1" Nominal

Bottom Angle: 30 degrees with a nose radius of 1/16" minimum

2.4 A metallurgical evaluation of the carbide insert shall show no evidence of cross grade contamination. Evaluation to be based on a photomicrograph of a polished and etched specimen at 500x magnification.

3. BRAZING

3.1 The brazing material shall be a high strength alloy type.

3.2 The tungsten carbide inserts shall be positioned in the milled groove at approximately .010 between the inserts the entire length of each cutting edge section.

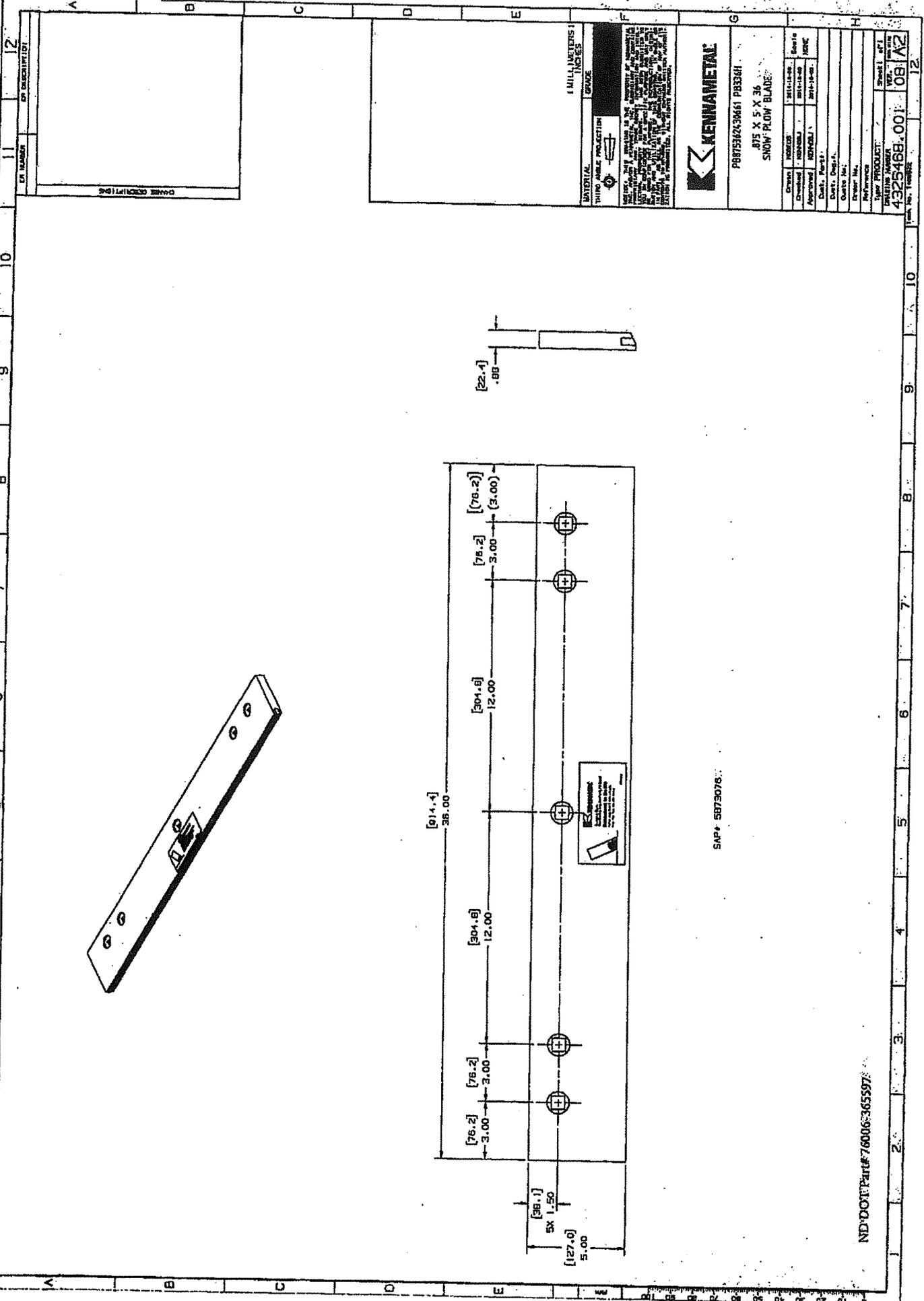
3.3 The inserts shall be brazed on all sides consistent with sound brazing practice with no evidence of voids or use of shims.



- 3.4 Each blade section to contain one insert, one inch nominal length for each inch of blade section length. Due to the thickness of the braze joints between inserts it may be necessary for several inserts to be slightly shorter or longer than the nominal 1" length to insure the carbide insert runs the entire length of the blade without protruding from the end of the steel body.

4. SPECIFIC REQUIREMENTS

- 4.1 The difference between the highest and lowest tip point (on any two adjacent inserts) not to exceed 1/32" on any given blade assembly.
- 4.2 The finished blade section shall be free of warpage and longitudinal deviation not to exceed 1/8" in a four-foot blade section.
- 4.3 Each blade section shall be identified with manufacturer's identification stamp.
- 4.4 The finished blade sections shall have marking showing the front edge of the blade to avoid improper mounting.

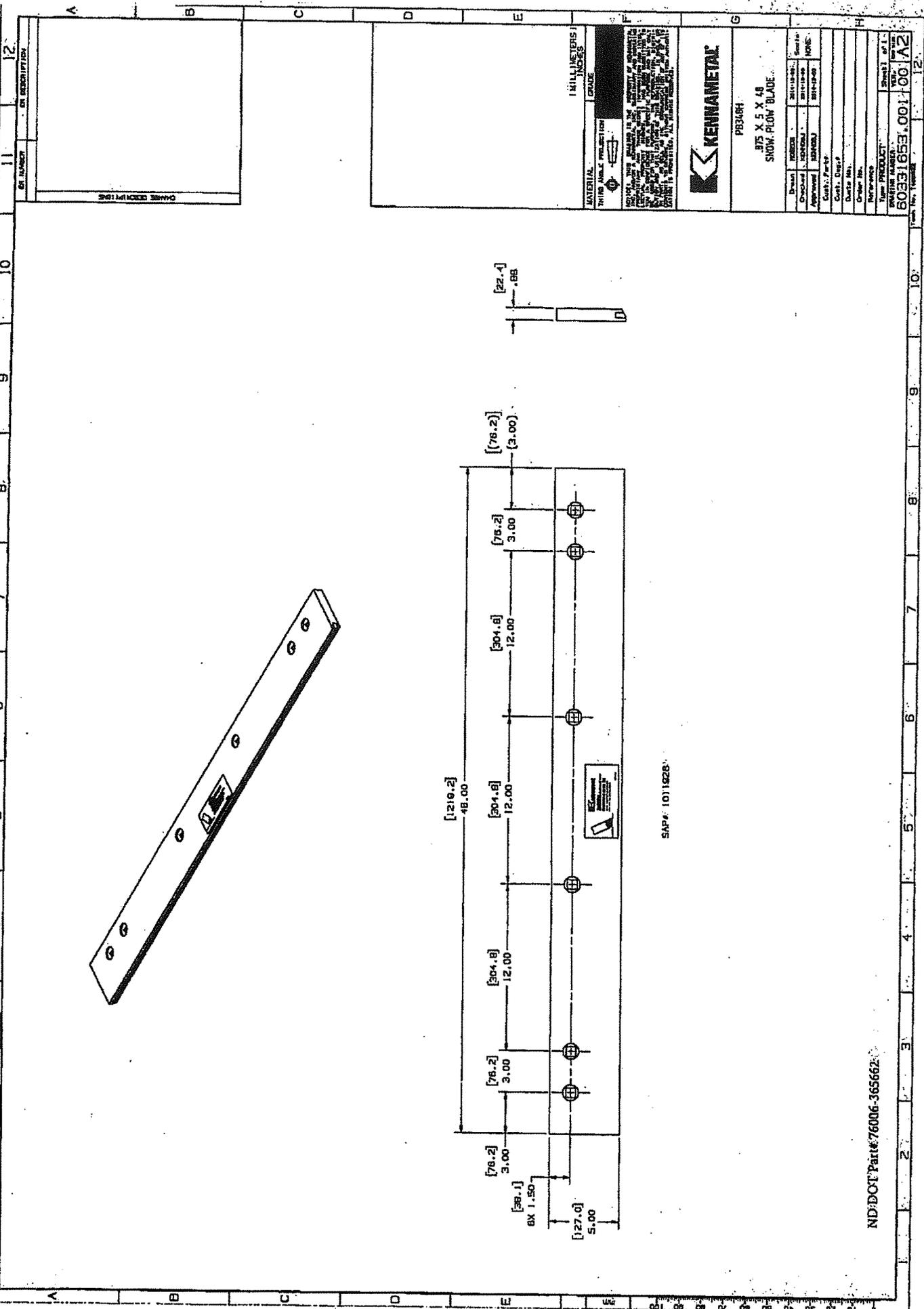


SAP# 5873076

ND DOT Part# 76006365597

Part No.	4325488.00
Sheet 1 of 1	08 / A2

07/20/2016 13:02:55 - Released TO: COLLARC | 60331653 MKD 007 001

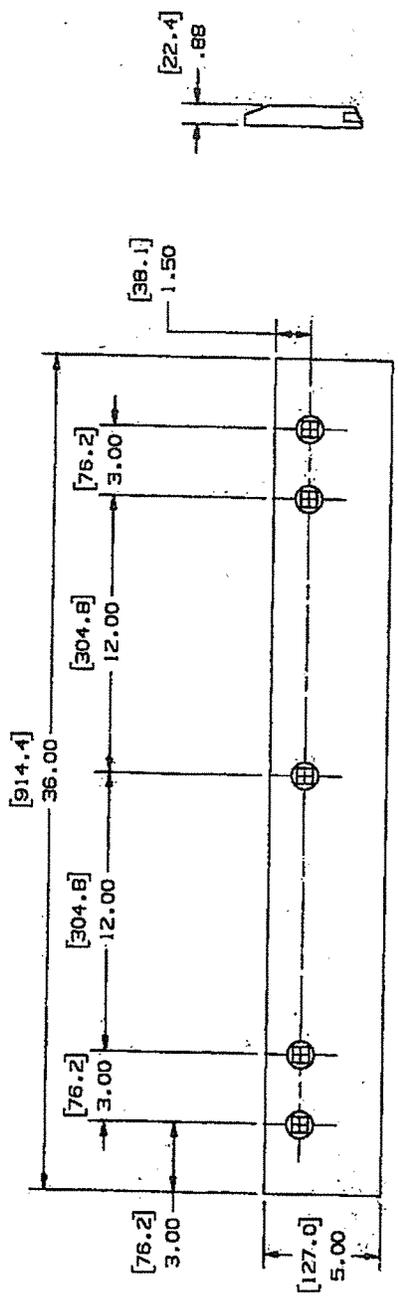
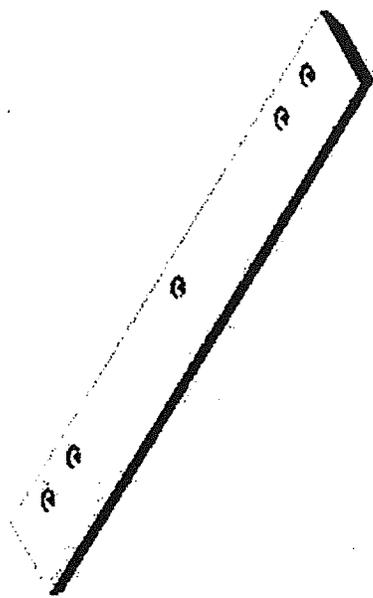


SAP# 10119228

ND/DOF Part# 76006-365662

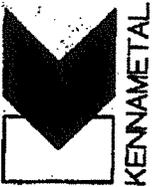
12	11	10	9	8	7	6	5	4	3	2	1																				
<p>CHANGE DESIGN PART</p>																															
<p>DESCRIPTION</p>																															
<p>1 MILLIMETERS INCHES</p>																															
<p>MATERIAL: 4130 SAE ALLOY STEEL FINISH: POLISHED</p>																															
<p>NOTE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL. IT IS TO BE USED FOR THE MANUFACTURE OF THE PART IDENTIFIED HEREIN ONLY. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF KENNAMETAL.</p>																															
<p>KENNAMETAL</p>																															
<p>PB346H .875 X .5 X .48 SNOW PLOW BLADE</p>																															
<table border="1"> <tr> <td>Drawn</td> <td>REVISED</td> <td>DATE</td> </tr> <tr> <td>Checked</td> <td>WORKING</td> <td>DATE</td> </tr> <tr> <td>Approved</td> <td>MANUAL</td> <td>DATE</td> </tr> <tr> <td>Coll. Desc.</td> <td></td> <td></td> </tr> <tr> <td>Order No.</td> <td></td> <td></td> </tr> <tr> <td>Quantity</td> <td></td> <td></td> </tr> <tr> <td>Notes</td> <td></td> <td></td> </tr> </table>											Drawn	REVISED	DATE	Checked	WORKING	DATE	Approved	MANUAL	DATE	Coll. Desc.			Order No.			Quantity			Notes		
Drawn	REVISED	DATE																													
Checked	WORKING	DATE																													
Approved	MANUAL	DATE																													
Coll. Desc.																															
Order No.																															
Quantity																															
Notes																															
<p>Part No. 76006-365662</p>																															
<p>Sheet 1 of 1</p>																															
<p>60331653.001.001 AZ</p>																															

7		B	
ER NUMBER 1108527		ER DESCRIPTION Credle Liner & Update to Std	
CHG DESCRIPTIONS			
MATERIAL		GRADE (MILLIMETERS) INCHES	
THIRD ANGLE PROJECTION			
<small>NOTICE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL INC. ALIENATION OF RIGHTS IN THIS DRAWING AND CONTAINED INFORMATION IS STRICTLY CONFIDENTIAL AND INTENDED FOR USE ONLY FOR THE SPECIFIC PURPOSE AND MAY ONLY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF KENNAMETAL INC. ALL RIGHTS RESERVED.</small>			
		.88 X 5 X 36 GRADER BLADE	
Drawn	REVISED	2015-12-01	Scale
Checked	REVISED	2015-12-01	NONE
Approved	REVISED	2015-12-01	
Cust. Part:		Cust. Desc:	
Order No.:		Reference:	
Type PRODUCT		Sheet 1 of 1	
DRAWING NUMBER		VER.	
MP4325866		003	
SAP #: 5090680		A3	
Task No. 157724		6	



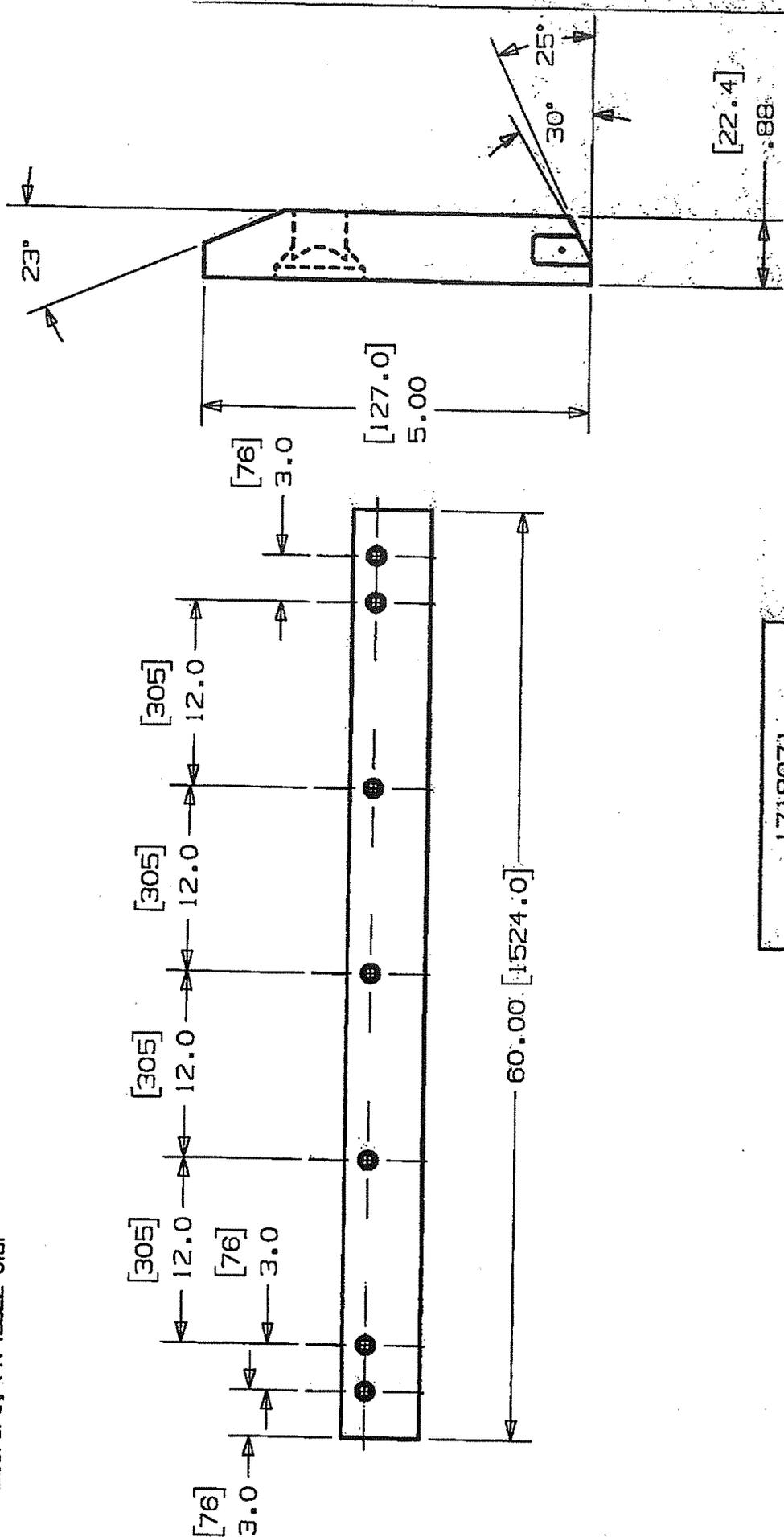
ND.DOT:Part# 76006-346009

SAP #: 5090680



Mining and Construction Division
442 Chalybeate Road
Bedford, PA 15522-0161

20050CT25



1718071
 GDR60/AO/43
 7/8 X 5 X 60 5/8 HOLE
 GRADER BLADE

NDIDION Part# 76006-366157

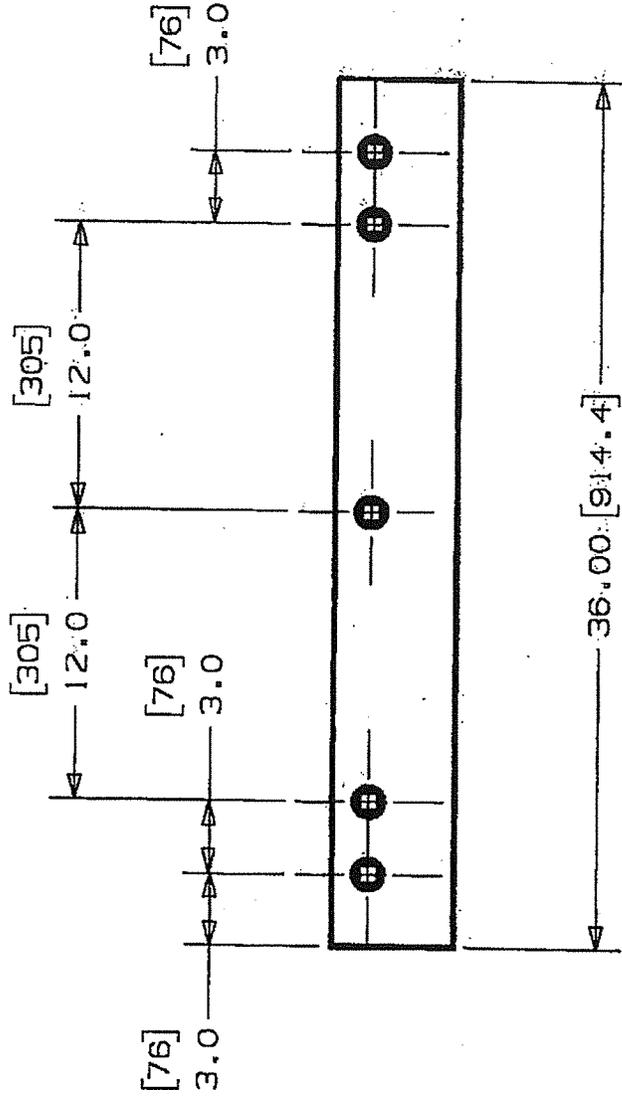
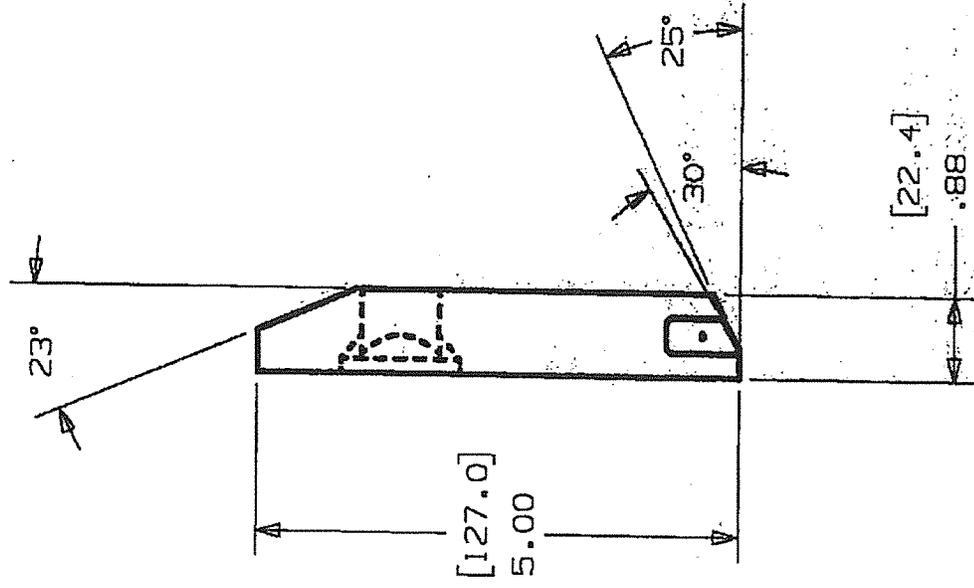
PLN # 4325873



KENAMETAL

Mining and Construction Division
442 Chalybeate Road
Bedford, PA 15022-0161

20050CT25

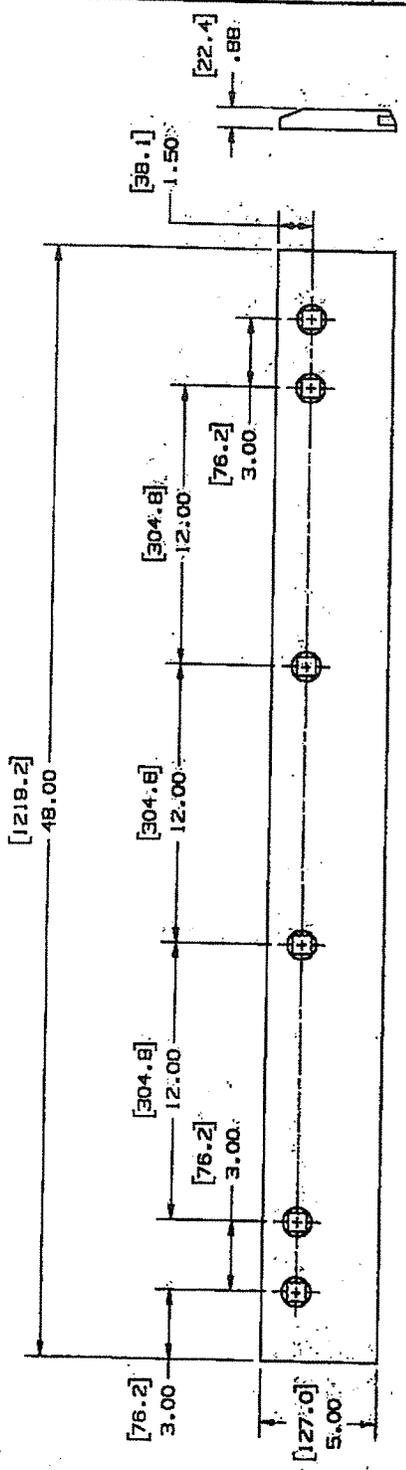
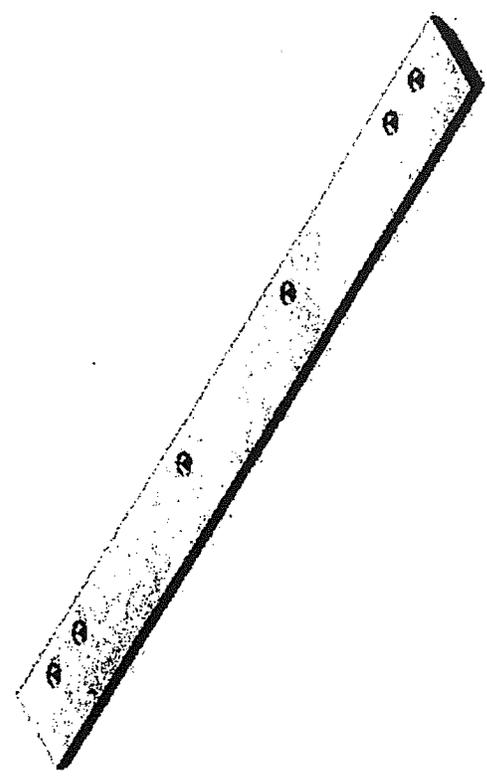


5090648
GDR36B0139
 7/8" X 5" X 36 3/4" HOLE
 GRADER BLADE

ND DOT Part# 76006 366009

PLN # 4325865

DR DESCRIPTIONS		DR DESCRIPTION / 1108527 Create Linerfl & Update to Std	
MATERIAL		GRADE	
THIRD ANGLE PROJECTION		NOTICE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. ANY UNAUTHORIZED REPRODUCTION OR USE OF THIS DRAWING IS PROHIBITED. ALL RIGHTS RESERVED.	
K KENNAMETAL		GDR48A014	
		.88 X 5 X .48 GRADER BLADE	
Drawn	Medals	2015-12-01	Scale
Checked	Revised	2015-12-01	NONE
Approved	Revised	2015-12-01	
Cost. Dept.	Quote No.		
Order No.	Reference		
Type PRODUCT	Sheet 1 of 1		
DRAWING NUMBER	VER.		
MP4325866.00	03		A3

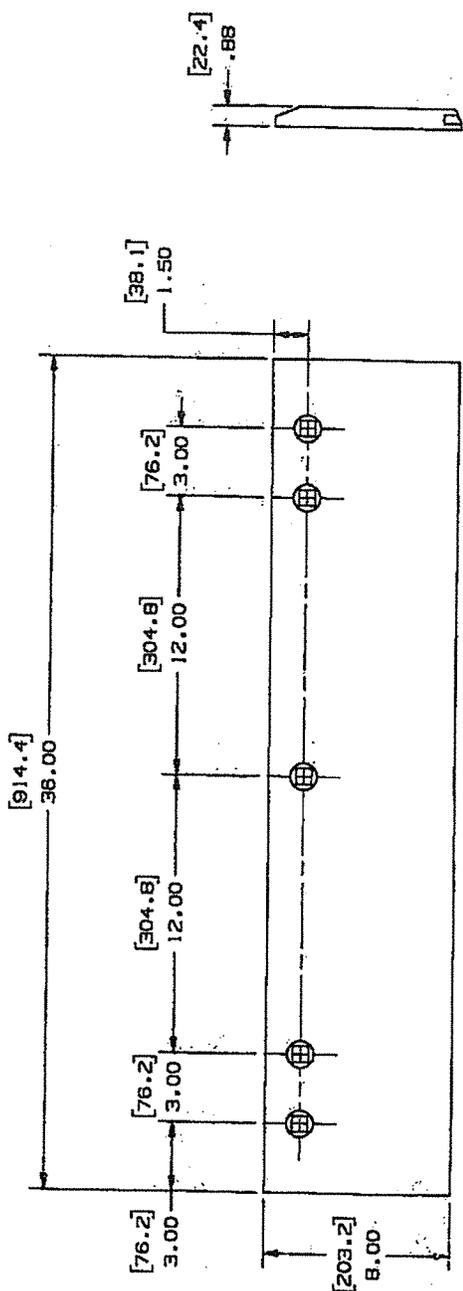
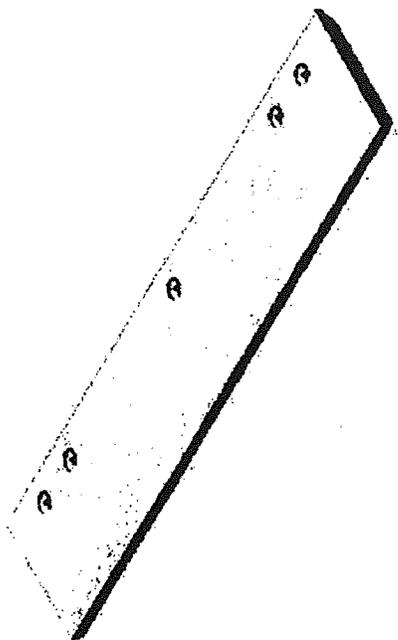


NDR DOW Part# 76006-366108 (3/4 Bolt)

SAP# 5090688

Cont. No. 157726

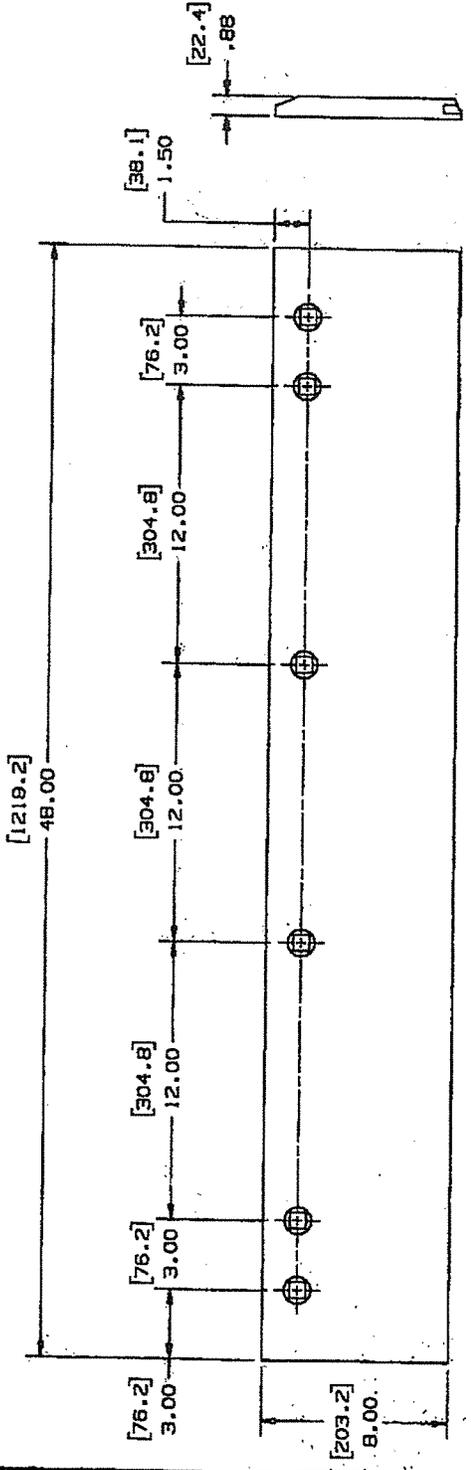
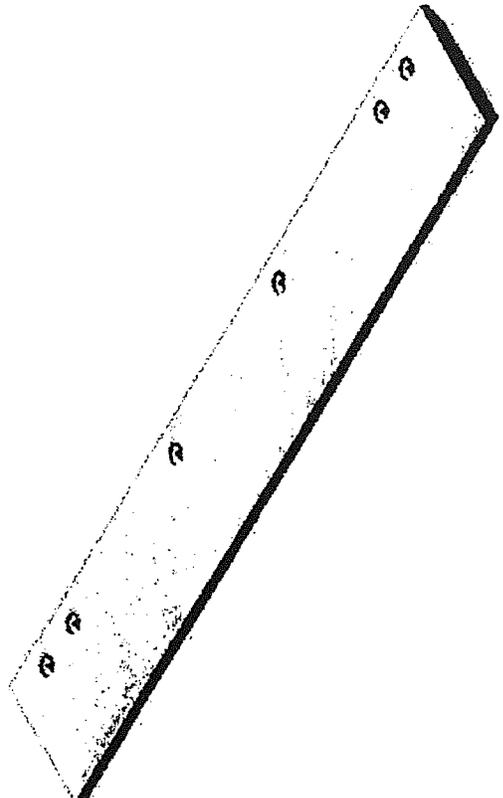
ER NUMBER 1108527		ER DESCRIPTION Create Linear: & Update to Std	
CHG DESCRIPTIONS			
MATERIAL THIRD ANGLE PROJECTION		GRADE MILLIMETERS INCHES	
<p>NOTICE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL INC. AND/OR A KENNAMETAL INC. SUBSIDIARY AND CONTAINS LEGAL INFORMATION. ANY REPRODUCTION OR TRANSMISSION OF THIS DRAWING FOR ANY PURPOSE, INCLUDING REPRODUCTION FOR A SPECIFIC PURPOSE, AND ANY SALE OR REUSE OF THIS DRAWING, IN WHOLE OR IN PART, WITHOUT THE WRITTEN PERMISSION OF KENNAMETAL INC. OR ITS SUBSIDIARIES IS PROHIBITED. ALL RIGHTS RESERVED.</p>			
		.88 X 8 X 36 GRADER BLADE	
Drawn	MEDALS	2018-12-03	Scale
Checked	ROSEDS	2018-12-03	NONE
Approved	ROSEDS	2018-12-03	NONE
Quoted	Part #		
Quote No.			
Order No.			
Reference			
Type PRODUCT		Sheet 1 of 1	
DRAWING NUMBER		VER.	
MP4325B66	00	03	A3



NDD/DOE Part# 75006-361604

SAP# 5090894

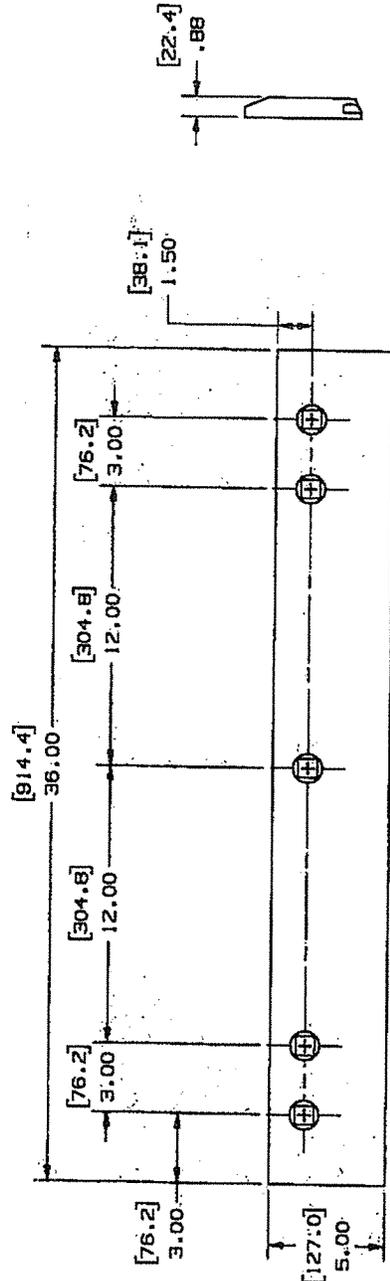
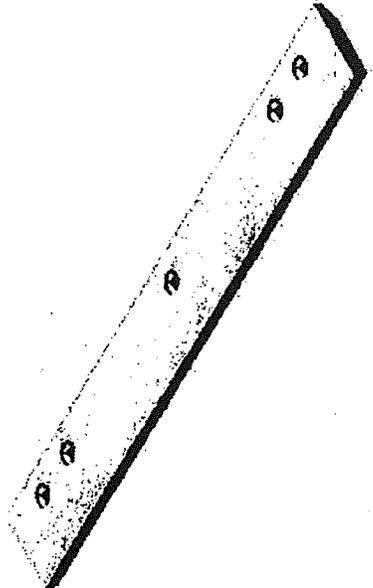
ER NUMBER 1108527		ER DESCRIPTION Create Lineart & Update to Std	
CHG DESCRIPTIONS			
MATERIAL THIRD ANGLE PROJECTION		GRADE (MILLIMETERS) INCHES	
<p>NOTICE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL. ANY REPRODUCTION, DISTRIBUTION, OR CONTAINS INFORMATION FROM THIS DRAWING IS STRICTLY PROHIBITED. ANY REPRODUCTION, DISTRIBUTION, OR CONTAINS INFORMATION FROM THIS DRAWING IS STRICTLY PROHIBITED. ANY REPRODUCTION, DISTRIBUTION, OR CONTAINS INFORMATION FROM THIS DRAWING IS STRICTLY PROHIBITED. ANY REPRODUCTION, DISTRIBUTION, OR CONTAINS INFORMATION FROM THIS DRAWING IS STRICTLY PROHIBITED.</p>			
KENNAMETAL		88 X 8 X 48 GRADER BEADE	
Drawn	MDALY	2018-12-01	Scale
Checked	ROSDYS	2018-12-01	NONE
Approved	ROSDYS	2018-12-01	
Quat. Probe			
Dupl. No.			
Order No.			
Reference			
Type PRODUCT			
Drawing Number			
MP4325866.00.03.A3			
Task No. 157724			



ND DOT Part# 76006-361638

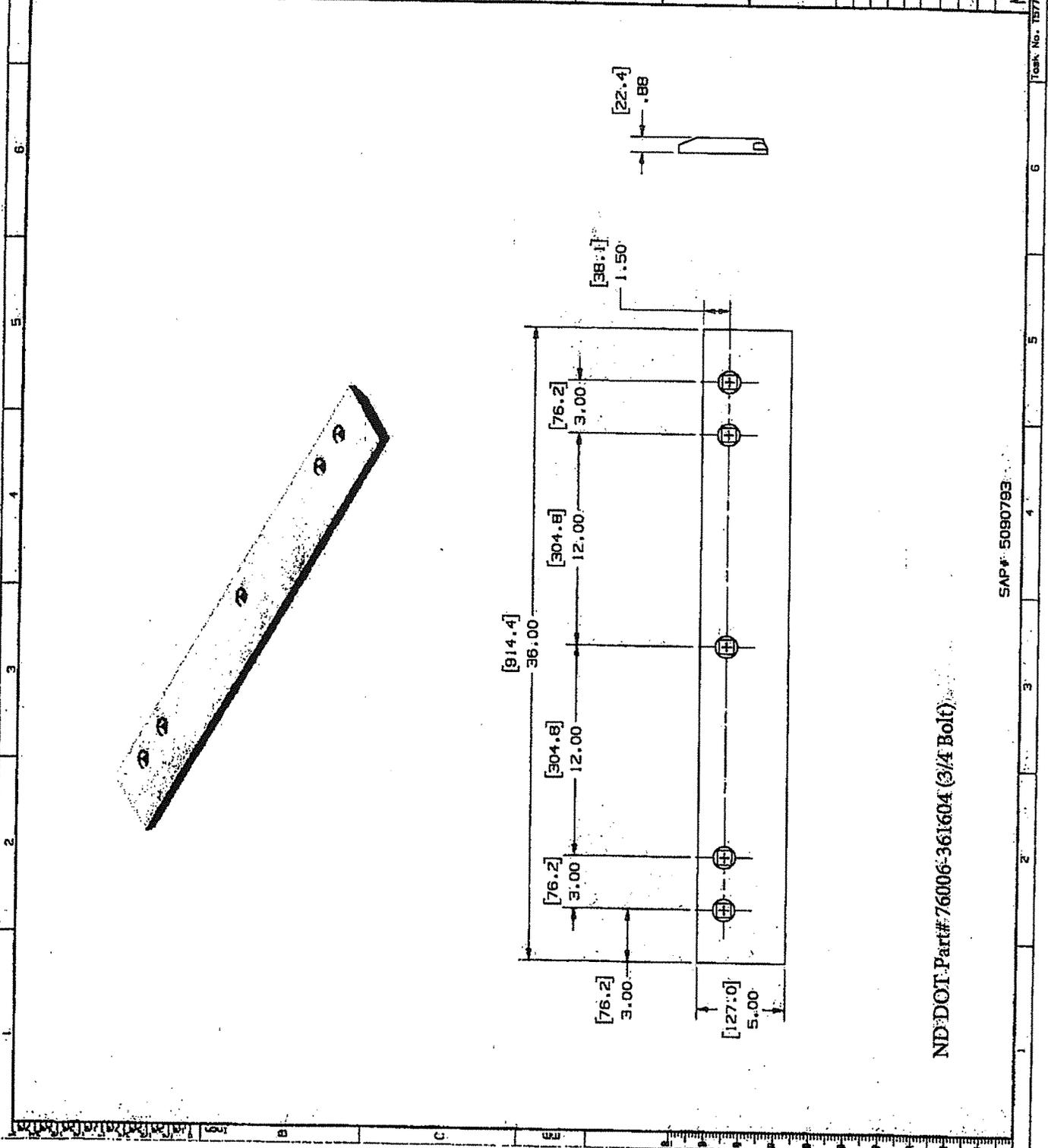
SAP# 5090791

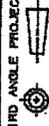
ER NUMBER 1108527		ER DESCRIPTION Create Linear & Update to 316	
CHG DESCRIPTIONS			
MATERIAL THIRD ANGLE PROJECTION		GRADE 1 MILLIMETERS) INCHES	
<p>NOTICE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL AND CONTAINS PROPRIETARY INFORMATION. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF KENNAMETAL. THE USE OF THIS DRAWING FOR ANY PURPOSE, IN WHOLE OR IN PART, IS PROHIBITED. ALL RIGHTS RESERVED.</p>			
		.88 X 5 X 36 GRADER BLADE	
Drawn	MEALS	2015-12-01	Scale
Checked	ROSEBOS	2015-12-01	NONE
Approved	ROSEBOS	2015-12-01	
Cust. Parts			
Quote No.			
Order No.			
Reference			
Type: PRODUCT			
Drawing Number			
Sheet 1 of 1			
VER. 03			
MP 4325866.00			
Task No. 1577721			

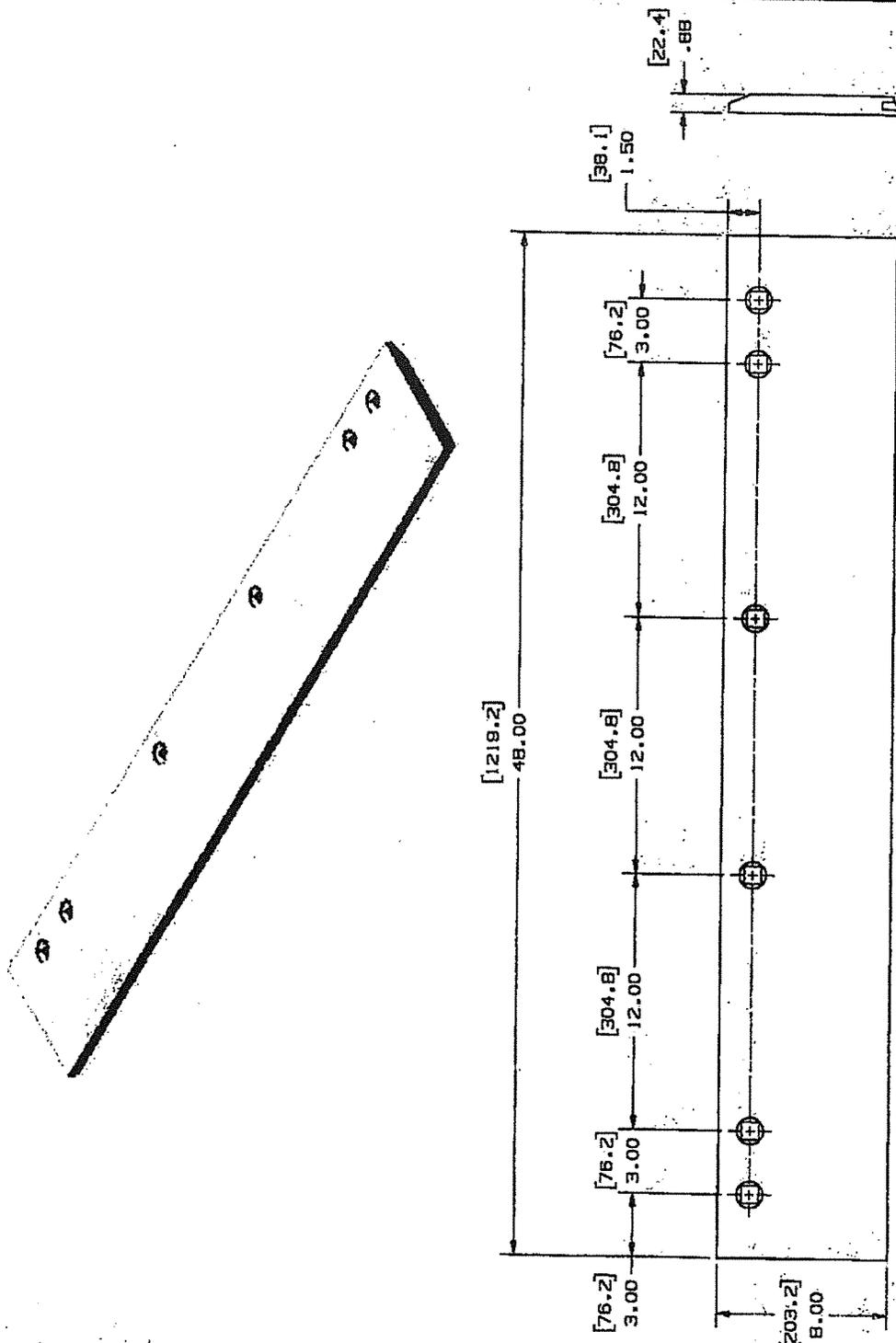


ND:DOT-Part# 76006-361604 (3/4 Bolt)

SAP# 5090793



7	ER NUMBER 1108527	ER DESCRIPTION Create Layout & Update to Std
8	CHG DESCRIPTIONS	
9	MATERIAL THIRD ANGLE PROJECTION	
10	GRADE 1 MILLIMETERS] INCHES	
11		
12	<p>NOTICE: THIS DRAWING IS THE PROPERTY OF KENNAMETAL AND CONTAINS PROPRIETARY AND TRADE SECRET INFORMATION. IT IS NOT TO BE REPRODUCED, COPIED, OR USED FOR ANY PURPOSES WITHOUT THE WRITTEN PERMISSION OF KENNAMETAL. IN THE EVENT OF ANY DISCREPANCY BETWEEN THIS DRAWING AND ANY OTHER DOCUMENTATION, THIS DRAWING SHALL PREVAIL. KENNAMETAL ASSUMES NO LIABILITY FOR DAMAGE TO PERSONS OR PROPERTY ARISING FROM THE USE OF THIS DRAWING. ALL RIGHTS RESERVED.</p>	
13		
14	88 X 8 X .48 GRADER BLADE	
15	Drawn	2018-12-01
16	Checked	2018-12-01
17	Approved	2018-12-01
18	Scale	NONE
19	Customer Name	
20	Customer Dept.	
21	Quote No.	
22	Order No.	
23	Reference	
24	Type	PRODUCT
25	Sheet # of #	
26	Drawn Number	MP.4325866.00
27	Ver. #	103
28	Task No.	157724

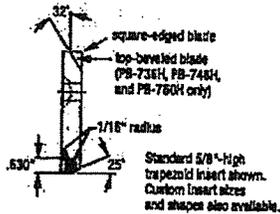
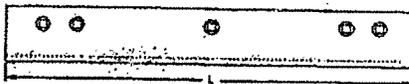


NEED OF Part# 76006-361638 (3/4 Bolt)

SAP# 5091381

Tungsten Carbide-Edged Snowplow Blades and Accessories

- Equipped with genuine Kennametal tungsten carbide inserts.
- Unparalleled hardness and fracture/wear resistance.
- Our brazing expertise ensures that inserts stay firmly in place — dramatically lowering your replacement part inventory and overall operating costs.
- Available in an unmatched variety of styles and sizes — each backed by the road maintenance industry's best quality assurance program.
- Sold in sections preventing the need to replace an entire blade — replace only the damaged segment.



Snowplow Blades • Ordering Information

length	catalog number	material number	blade dimensions	bolt hole distance from top	hole spacing	lbs
Standard-Size 5/8" Carbide Inserts						
24"	PB-124	1011840	3/4 x 6 x 24"	2"	3-3-12-3-3"	31
28"	PB-128C	1011805	3/4 x 6 x 28"	2"	6-8-8-6"	36
36"	PB-136	1011807	3/4 x 6 x 36"	2"	3-3-12-12-3-3"	47
36"	PB-136H	1011848	7/8 x 5 x 36"	1-1/2"	3-3-12-12-3-3"	45
36"	PB-236	1011842	3/4 x 6 x 36"	1-1/2"	3-3-12-12-3-3"	47
36"	PB-436	1011859	3/4 x 5 x 36"	1-1/2"	3-3-12-12-3-3"	38
36"	PB-736H top beveled	1011883	7/8 x 5 x 36"	1-1/2"	3-3-12-12-3-3"	40
42"	PB-142	1011815	3/4 x 6 x 42"	2"	3-3-12-12-8-3-3"	53
44"	PB-144E	1011811	3/4 x 6 x 44"	2"	2-8-8-8-8-2"	57
44"	PB-144C	1011809	3/4 x 6 x 44"	2"	6-8-8-8-8-6"	57
48"	PB-148	1011813	3/4 x 6 x 48"	2"	3-3-12-12-12-3-3"	62
48"	PB-148H	1011854	7/8 x 5 x 48"	1-1/2"	3-3-12-12-12-3-3"	60
48"	PB-248	1011844	3/4 x 6 x 48"	1-1/2"	3-3-12-12-12-3-3"	62
48"	PB-448	1011861	3/4 x 5 x 48"	1-1/2"	3-3-12-12-12-3-3"	51
48"	PB-748H top beveled	1011885	7/8 x 5 x 48"	1-1/2"	3-3-12-12-12-3-3"	55
60"	PB-160C	1011819	3/4 x 6 x 60"	2"	6-8-8-8-8-6"	77
60"	PB-760H top beveled	1011887	7/8 x 5 x 60"	1-1/2"	3-3-12-12-12-12-3-3"	70
Heavy-Duty 3/4" Carbide Inserts						
36"	PB-336	1011968	3/4 x 6 x 36"	1-1/2"	3-3-12-12-3-3"	47
36"	PB-336H	1011924	7/8 x 5 x 36"	1-1/2"	3-3-12-12-3-3"	47
36"	GDR36A0138 top beveled	1011928	7/8 x 5 x 36"	1-1/2"	3-3-12-12-3-3"	45
48"	PB-348	1011970	3/4 x 6 x 48"	1-1/2"	3-3-12-12-12-3-3"	62
48"	PB-348H	1011926	7/8 x 5 x 48"	1-1/2"	3-3-12-12-12-3-3"	62
48"	GDR48A0140 top beveled	1011930	7/8 x 5 x 48"	1-1/2"	3-3-12-12-12-3-3"	57
60"	PB-360	1011972	3/4 x 6 x 60"	1-1/2"	3-3-12-12-12-12-3-3"	77
72"	PB-372	1011974	3/4 x 6 x 72"	1-1/2"	3-3-12-12-12-12-3-3"	92
57" Tall Bullnose Inserts						
36"	PB875362470182	3323727	7/8 x 5 x 36"	1-1/2"	3-3-12-12-3-3"	42
48"	PB875482470183	3323726	7/8 x 5 x 48"	1-1/2"	3-3-12-12-12-3-3"	55
60"	PB875603470217	3505710	7/8 x 5 x 60"	1-1/2"	3-3-12-12-12-12-3-3"	72
Made-To-Order Inserts						
44"	7/8X6X44W/.81X40DEG	1157211	7/8 x 6 x 44"	2"	2-(10) 4" spaces-2	84
48"	7/8X6X48W/.81X40DEG	1157212	7/8 x 6 x 48"	2"	4-(5) 8" spaces-4	71
58"	PB876561440148	3007351	7/8 x 6 x 58"	2"	4-(6) 8" spaces-4	79

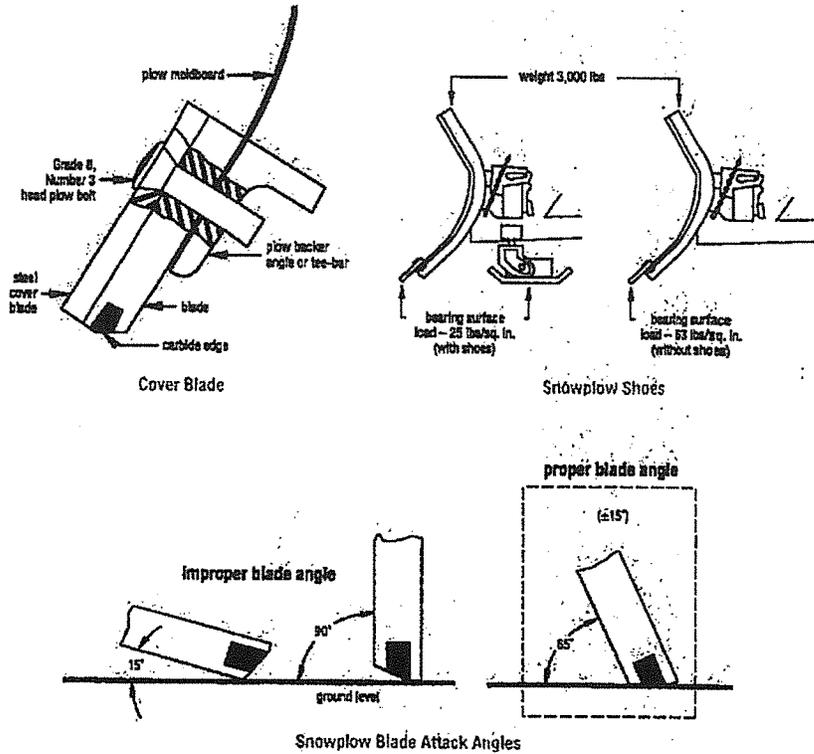
Snowplow Blades and Shoes Operating Tips

To significantly reduce blade chatter and bolt failure, we highly recommend Grade 8, Number 3 head plow bolts with self-locking nuts for mounting our blades.

We also recommend use of a "cover blade" — a steel section bolted to the front of the carbide blade — to reinforce your moldboard, absorb shock, and greatly diminish steel erosion around the carbide insert area. Cover blades can improve blade life by as much as 30%.

Snowplow shoes can be employed with our snowplow blades to provide uniform plow frame weight distribution.

Lastly, we strongly suggest that you set your snowplow blade attack angle at 65° from the ground. A higher or lower angle can result in increased vibration and decreased wear life.



For unparalleled service life on underbody plows!

- Kennametal wear grade carbide insert resists deterioration caused by blade down pressure and abrasion.
- Kennametal mining grade carbide insert on face resists impact and erosion.

Unsurpassed in ice removal!

- Long-life Kennametal carbide-tipped conicals rotate as they cut — sharpening themselves and providing a uniform wear pattern. Worn teeth can be quickly changed onsite by one person.

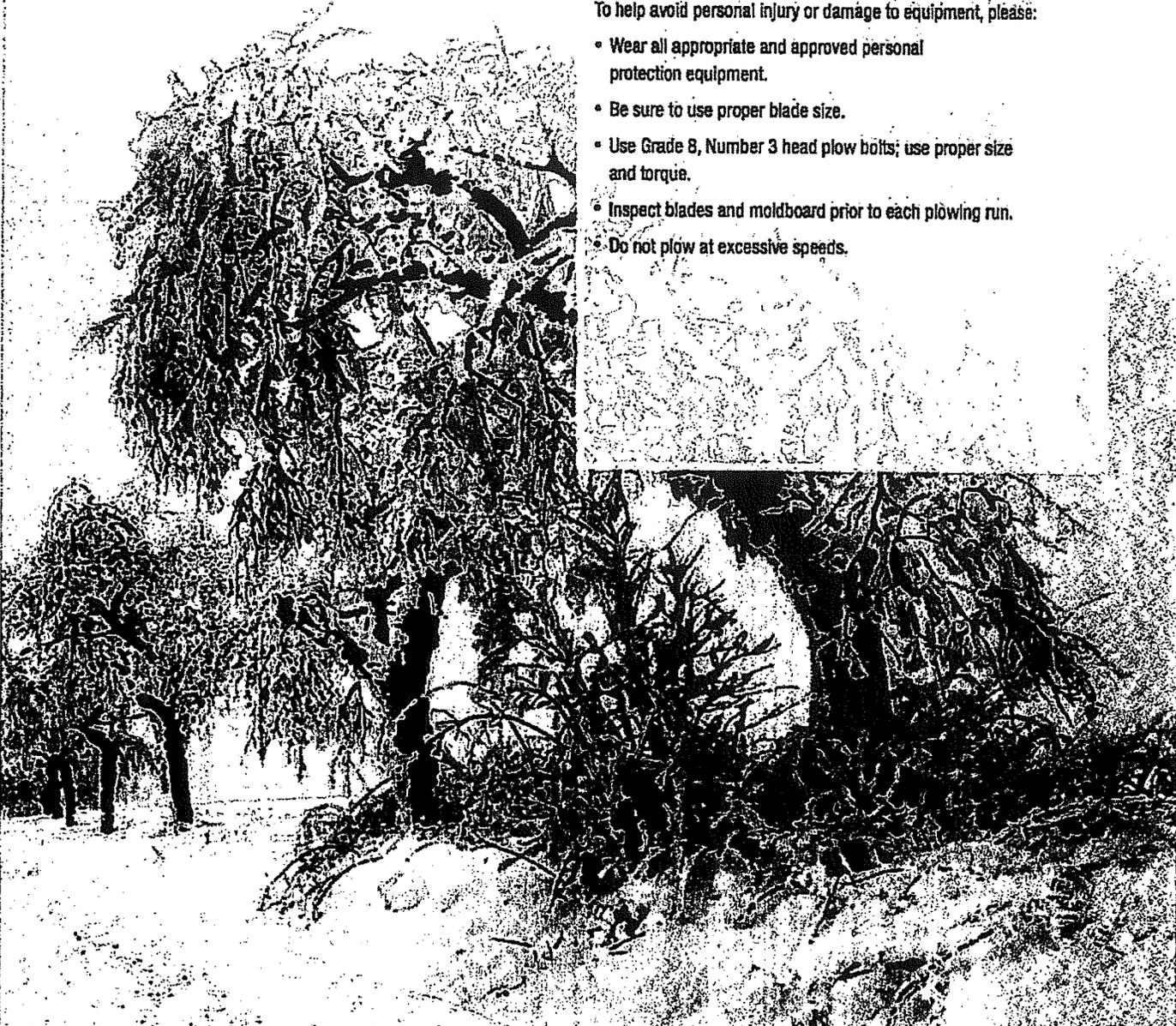
Tungsten Carbide Grader and Scarifier Blades

- Our proprietary dual carbide-edge grader blades stay straight, maintain a clean/sharp cutting edge, and stop crowning.
- Kennametal scarifier blades feature replaceable carbide tools that rotate as they cut, easily penetrating ice and hard-packed gravel roads — enabling you to quickly bring embedded rock back to the surface.

Safety Note

Kennametal Inc. is concerned with the safe use of its products. To help avoid personal injury or damage to equipment, please:

- Wear all appropriate and approved personal protection equipment.
- Be sure to use proper blade size.
- Use Grade 8, Number 3 head plow bolts; use proper size and torque.
- Inspect blades and moldboard prior to each plowing run.
- Do not plow at excessive speeds.



Kennametal, the stylized K, I.C.E. Series, and KenCast are trademarks of Kennametal Inc., and are used as such herein.

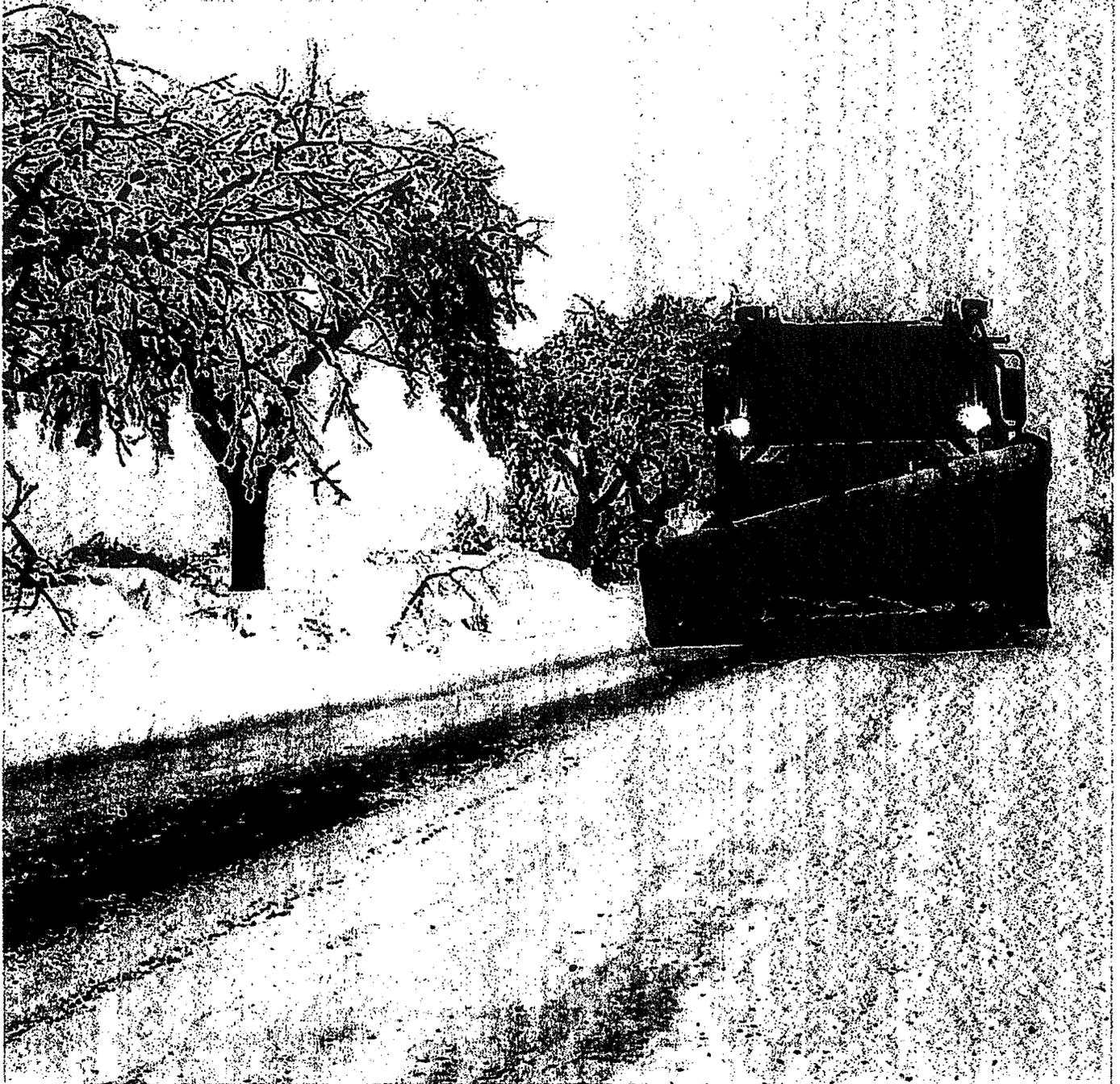
Fisher, Meyer, The Boss, and Western are trademarks of their respective companies, and are used as such herein.



You can't do a job — and do it right — without tools that are up to the challenge.

Kennametal is continually engineering products that will provide exceptional performance on snow and ice removal. Our blades come in a wide variety of styles and sizes each backed by the road maintenance industry's best quality assurance program.

Kennametal uses the best in engineering to give you unsurpassed quality and performance.





KENNAMETAL INC.
MINING AND CONSTRUCTION DIVISION

RECOMMENDED SPECIFICATIONS FOR
I.C.E. (Isolated Carbide Edge)
SNOWPLOW BLADE CUTTING EDGES (BLADES)

The following specifications have been developed by Kennametal Inc. to describe I.C.E. style blades. These specifications are recommended to be used by State and Municipal Highway Departments to procure and inspect I.C.E. style blades to insure they receive a superior quality product. The blades are to be manufactured according to the attached drawings using materials conforming to the following:

1. BLADE

- 1.1 The blade shall be fabricated using flat hot-rolled finished steel to meet or exceed specifications for SAE 1040-1045 type steel.
- 1.2 Punching shall be 11/16" square holes with countersink to receive 5/8" diameter plow bolts. Location and spacing of the holes shall be as specified by the user. For Standard Highway Punch style spacing refer to the attached drawing.
- 1.3 Center of bolt holes shall be in line within 1/32" of established horizontal centerline and 1/16" of established vertical centerline.

2. TUNGSTEN CARBIDE INSERTS

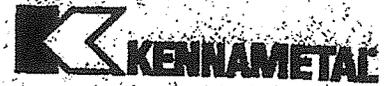
- 2.1 The inserts shall be a high shock WC grade of tungsten carbide with (10.5 to 12.5) percent cobalt content.

Density: 13.9 Minimum to 14.6 Maximum

Hardness: 86.8 Minimum to 89.2 Maximum
Rc. "A" Scale or Equivalent based on appropriate coercive force correlation.

The Maximum Allowable Porosity: (Based on testing in accordance with ASTM designation B276-79) shall be:

A08
B04
C00



- 2.2 The carbide insert manufacturer to furnish certification to the State Highway Department that the inserts meet the specifications as set forth in 2.1.
- 2.3 The inserts shall be a cylindrical design with a dome-shaped end of the following dimensions:
- Height: .753" +/- .007 (long side)
- Diameter: .523" +/- .004
- 2.4 A metallurgical evaluation of the carbide insert shall show no evidence of cross grade contamination. Evaluation to be based on a photomicrograph of a polished and etched specimen at 500x magnification.

3. BRAZING

- 3.1 The brazing material shall be a high strength alloy type.
- 3.2 The tungsten carbide inserts shall be positioned in holes drilled in the center of the thickness of the blade and shall be spaced .75" center to center along the entire length of each cutting edge section.
- 3.3 The inserts shall be brazed on all sides consistent with sound brazing practice with no evidence of voids in the braze joint.

SPECIFIC REQUIREMENTS

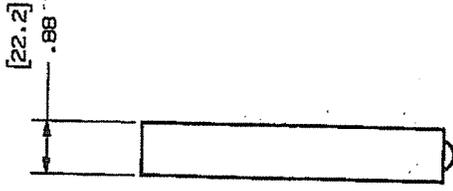
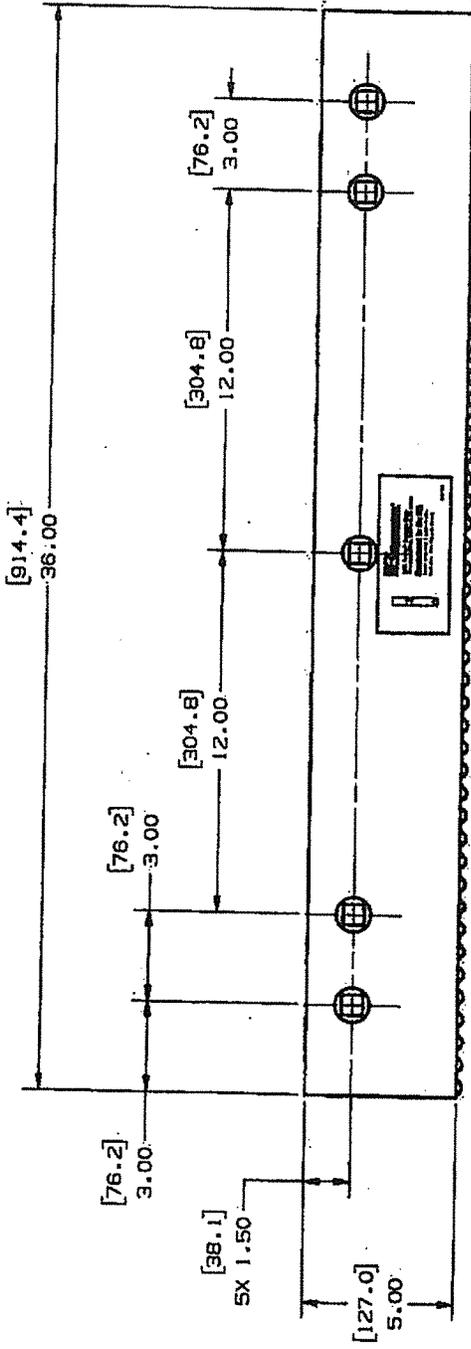
- 3.4 The finished blade section shall be free of warpage and longitudinal deviation not to exceed 1/8" in a four-foot blade section.
- 3.5 Each blade section shall be identified with manufacturer's identification stamp into the metal or on a label in a non-wear area of the blade.

04/18/2016 10:56:19 - Released - DOLLARC | 4888102 NXD 000 00



Mining and Construction Division
442 Chalfont Road
Bedford, PA 15522-0161

2011-11-10



1553693
 PB536
 7/8 X 5 X 36
 ICE SNOWPLOW BLADE
 ASSEMBLY W/O BEVEL

ND DOT Part#:
 76006-653693
 Square Top

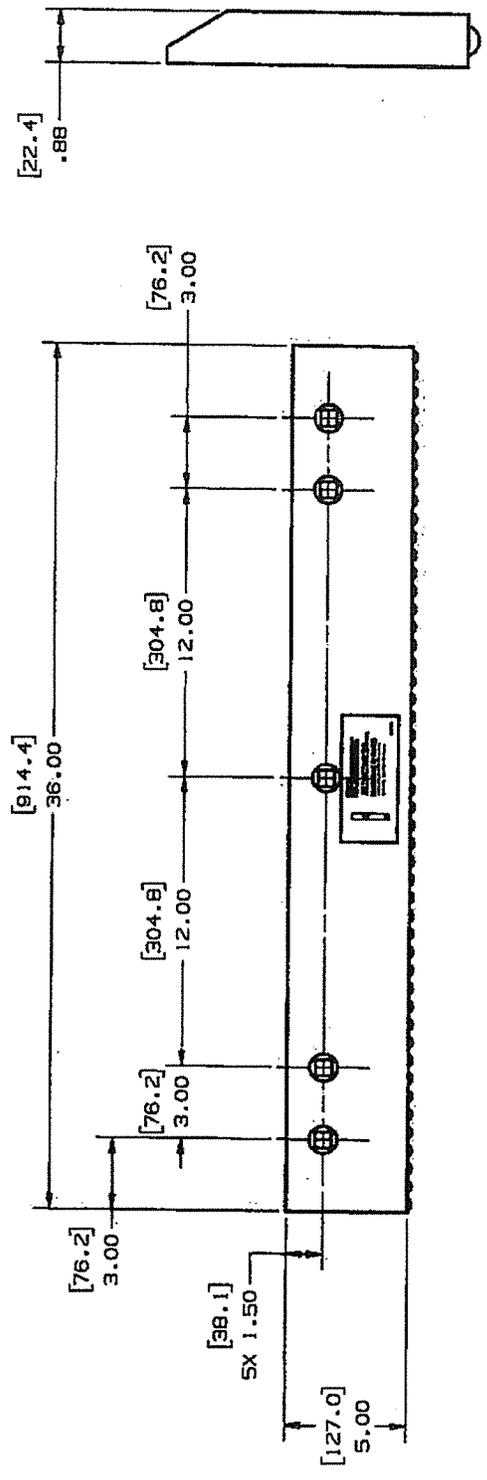
PLM # 4888102

09/22/2015 13:34:36 Released DOLLAR 4888362 NXD 000 00



Mining and Construction Division
442 Chalfont Road
Bedford, PA 15522-0161

2011-11-11



ND DON Part#
76006-653693
Beveled Top

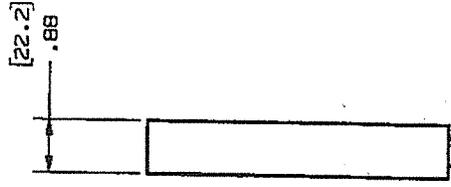
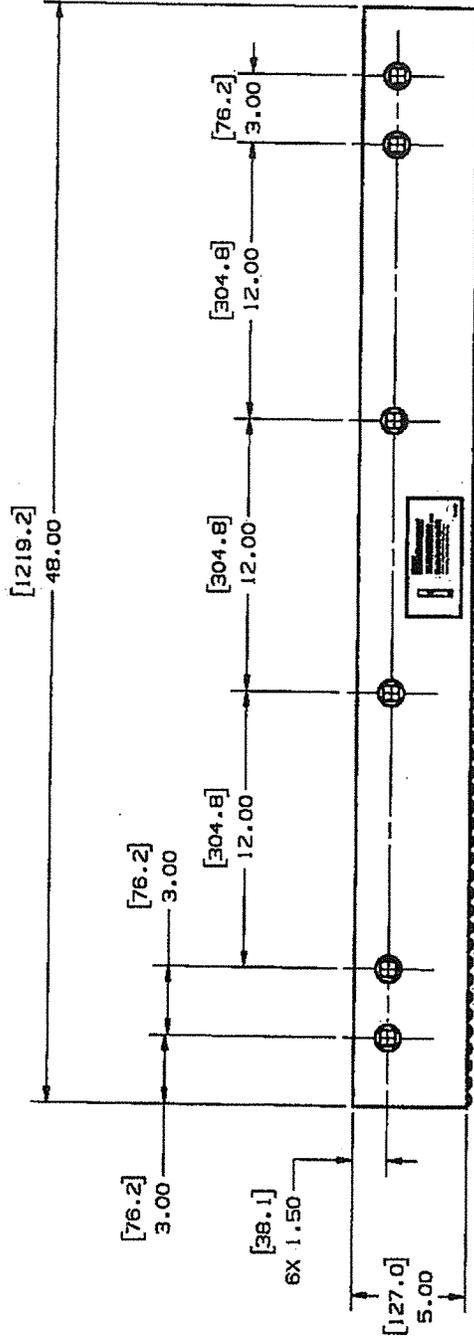
2035932
PB636
7/8" X 5" X .36"
N.C.E GRADER FLOW BLADE
ASSEMBLY

PLM Y 4888362



Mining and Construction Division
442 Chalfonte Road
Bedford, PA 15522-0161

2011-11-10



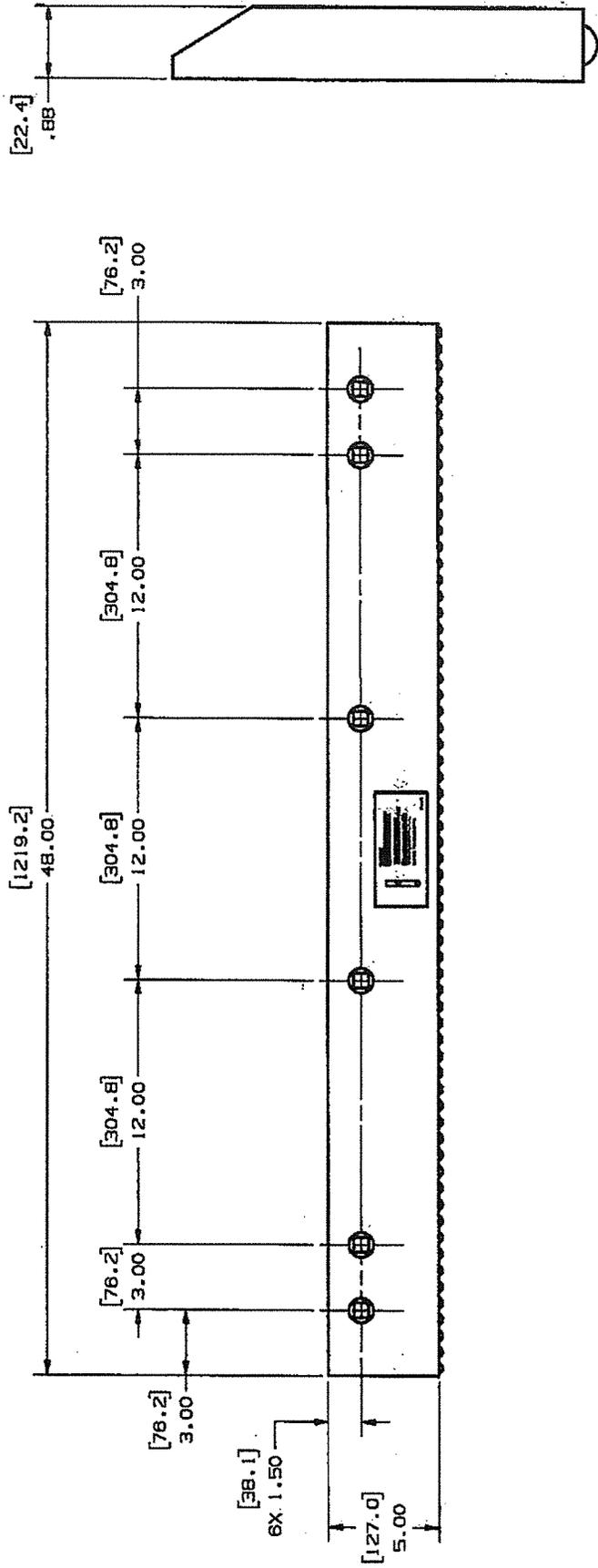
ND DOT Part#
76006-654894
Square Top

1553694
PB548
7/8 X 5 X 48
ICE SNOWPLOW BLADE
ASSEMBLY W/O BEVEL



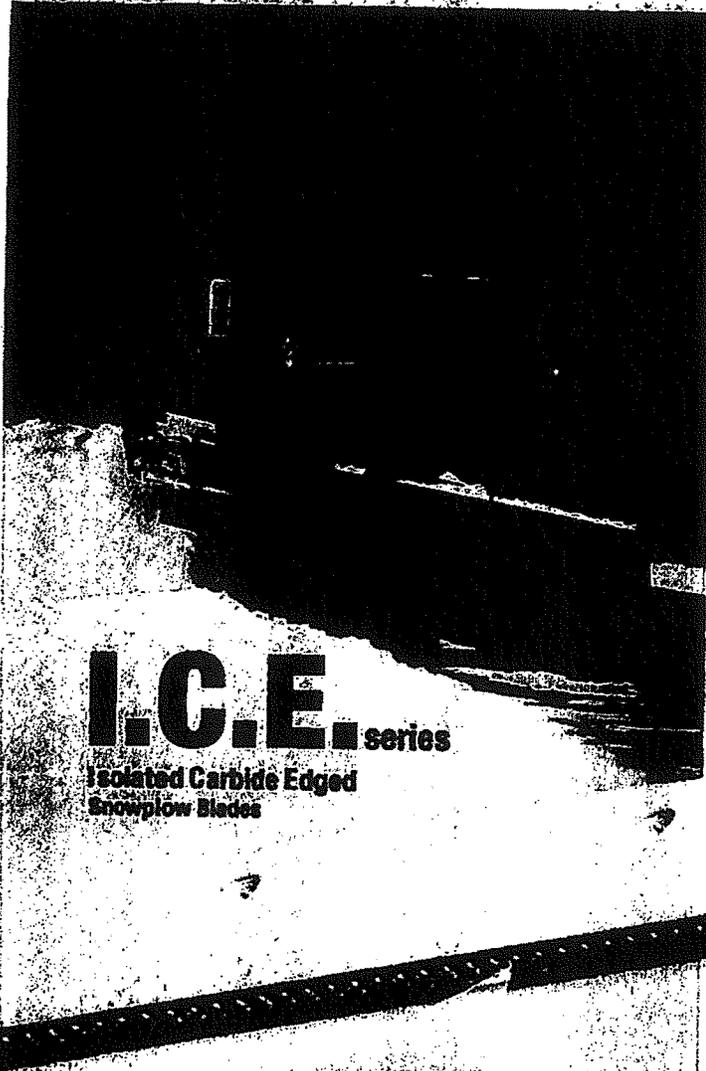
Mining and Construction Division
142 Chestnut Street
Philadelphia, PA 19102-0181

2011-11-11

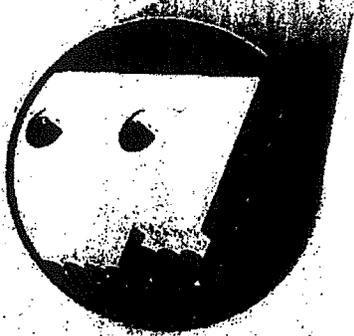


2035931
PB648
7/8" X 5" X .48"
C.E. GRADER FLOW BLADE
ASSEMBLY

ND.DOE Part#:
76006-65/4894
Reveled Top



I.C.E. series
Isolated Carbide Edged
Snowplow Blades



Lasts up to three times longer than standard carbide-edged styles in impact conditions!

Kennametal I.C.E.-Series™ Isolated Carbide-Edged Blades...
...engineered specifically to last exceptionally long in even the most challenging road conditions!

- especially effective in applications involving imbedded lane markers and rumble strips — greatly reducing blade breakage!
- ideal for high-speed plowing over roads with excessive joints and cracks — uneven surfaces, too!
- ultra-durable, dome-shaped carbide inserts are securely mounted and strategically isolated from one another to provide optimum fracture resistance throughout the entire blade length!
- available in 3' and 4' (7/8"-thick; 5"-high) sections that can be easily installed and rotated on the plow for balanced wear throughout a season!
- patented design!

Ordering Information – I.C.E. Blades

Blade Length (inch)	Catalog Number	Material Number	Blade Dimensions (inch)	Bolt Hole Distance from Top	Hole Spacing (inch)	Weight (lbs.)
Square Top Edge for Snowplows						
36"	PB-536	1553693	7/8 x 5 x 36	1-1/2	3-3-12-12-3-3	45
48"	PB-548	1553694	7/8 x 5 x 48	1-1/2	3-3-12-12-12-3-3	62
Top Edge Beveled for Graders						
36"	PB-636	2035932	7/8 x 5 x 36	1-1/2	3-3-12-12-3-3	45
48"	PB-648	2035931	7/8 x 5 x 48	1-1/2	3-3-12-12-12-3-3	62
60"	PB-660	3384812	7/8 x 5 x 60	1-1/2	3-3-12-12-12-12-3-3	72

Rounded-tip carbide inserts deliver exceptional penetration performance in even the hardest-packed snow!



KENNAMETAL INC.
MINING AND CONSTRUCTION
DIVISION

RECOMMENDED SPECIFICATIONS
FOR
I.C.E. (Isolated Carbide Edge) Style
Blade Savers and Curb Guards

The following specifications have been developed by Kennametal Inc. to describe Curb Guards. These specifications are recommended for use by State and Municipal Highway Departments to procure and inspect these products to insure they receive a superior quality product. The parts are to be manufactured according to the attached drawings using materials conforming to the following:

1. BLADE

- 1.1 The main flat blade portion shall be fabricated using 1" thick flat hot-rolled finished steel to meet or exceed specifications for A36 or 1020 type steels.
- 1.2 Punching shall be 11/16" square holes with countersink to receive 5/8" diameter plow bolts. Location and spacing of the holes shall be as specified by the user. For "Standard Highway Punch" style spacing refer to the attached drawing. The holes of the Curb Guard will be countersunk on both sides so that the part can be used for either a "right hand" or "left hand" part.
- 1.3 Center of boltholes shall be in line within 1/32" of established horizontal centerline and 1/16" of established vertical centerline

2. KENCAST WEAR GUARD

The end guard to be made of Kennametal Kencast material—a composite combining the exceptional hardness of Kennametal cemented tungsten carbide with the toughness of air-hardening steel to resist wear in severe operating conditions. The type and amount of steel matrix and tungsten carbide in a composite varies.



- 2.1 The ranges for the composite ingredients:

Tungsten Carbide	86-91 HRA
Matrix Steel (bonded to carbide)	52-58 HRC
Base Steel	38-50 HRC

- 2.2 Air-hardening (Cr-Ni-Mo) steel is used. During the metallurgical bonding, the matrix steel (around the carbide particles) alloys with tungsten and cobalt.

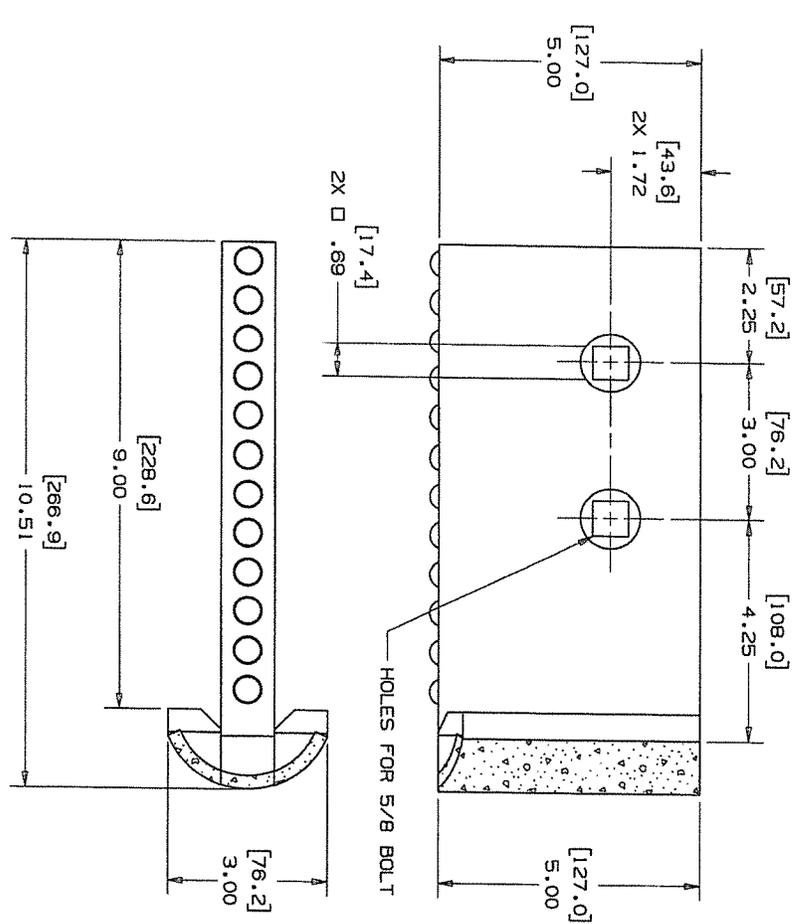
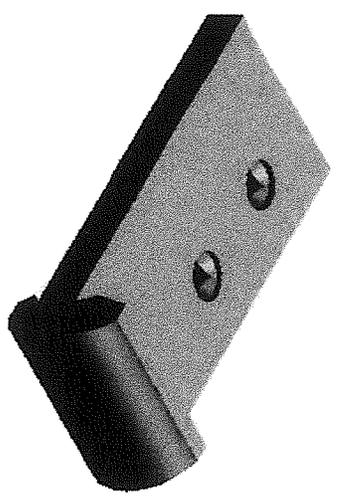
- 2.3 Tungsten carbide granules are approximately ¼-inch-thick in the wear surface.

- 2.4 Steel Matrix (figures are weight%)

Carbon	.28-.35	Nickel	1.0-2.0
Manganese	1.5-2.0	Chrome	.80-1.2
Silicon	1.3-1.7	Molybdenum	.20-.30
Aluminum	.08-.15		

3. SPECIFIC REQUIREMENTS

- 3.1 Each blade section shall be identified with manufacturer's identification stamp into the metal or on a label in a non-wear area of the blade.



ER NUMBER	ER DESCRIPTION
122935B	

CHG DESCRIPTIONS

MATERIAL: _____ GRADE _____

THIRD ANGLE PROJECTION

NOTICE: THIS DRAWING IS THE PROPERTY OF KENAMETAL INC. AND/OR A KENAMETAL SINGAPORE SUBSIDIARY AND CONTAINS CONFIDENTIAL INFORMATION. IT HAS BEEN SUBMITTED TO THE APPLICABLE AUTHORITIES FOR PROTECTION AND WILL REMAIN THE PROPERTY OF KENAMETAL INC. AND/OR A KENAMETAL SINGAPORE SUBSIDIARY. ANY REPRODUCTION OR UNAUTHORIZED USE OF THIS DRAWING OR ITS CONTENTS IS PROHIBITED. ALL RIGHTS RESERVED.



KCWB-0486
 SPB I.C.E. CURB BUMPER
 ASSEMBLY

Drawn	ACHARD	2020-01-23	Scale
Checked	KENNOBU	2020-01-30	NONE
Approved	KENNOBU	2020-01-30	NONE
Quot. Part#			
Quot. Dwg.#			
Quote No.			
Order No.			
Reference			

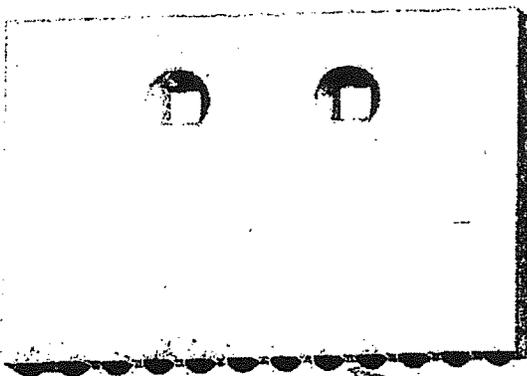
Type PRODUCT	Sheet 1 of 1
DRAWING NUMBER	VER. Dwg SIZE
4903148.001	03 A3

Task No.: T904038

SAP# 2040087

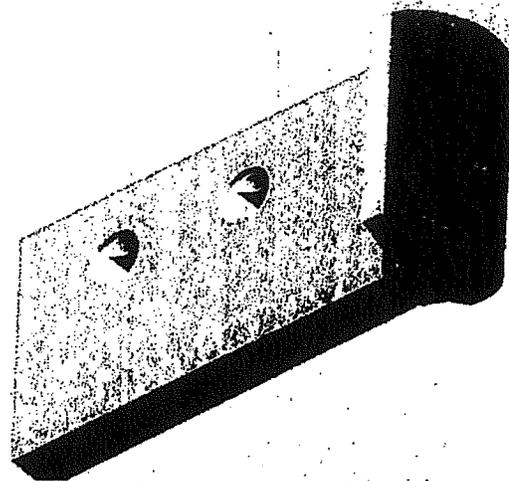
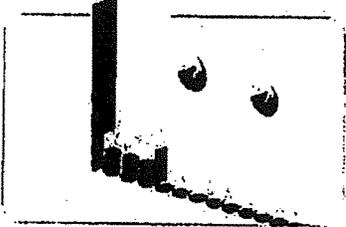
Kennametal's I.C.E. style Blade-Savers

- Blade Savers mount over standard blades using the same bolt holes
- Blade Savers can be strategically positioned at high wear areas of moldboard
- Blade Savers incorporate Kennametal's exclusive I.C.E. (Isolated Carbide Edge) tungsten carbide insert technology to increase wear life while resisting breakage
- Blade Savers are available in a variety of sizes and bolt patterns to fit most popular plow and blade styles



I.C.E. Blade Saver

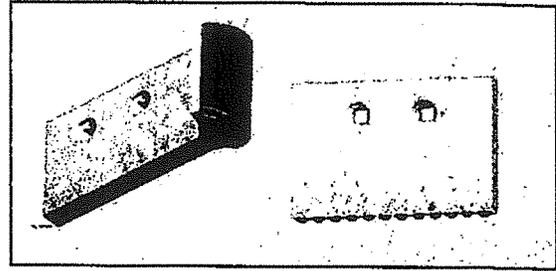
I.C.E. Blades Savers and Curb Guards feature bullet shaped, individually spaced carbide inserts for maximum breakage resistance



I.C.E. Blade Saver and Curb Guard combination

I.C.E. Curb Guards use tough KenCast composite material to protect the blade end from the curb. KenCast is a combination of tungsten carbide granules in a tough and wear resistant steel matrix manufactured in our own foundry. The bottom edge is protected with I.C.E. inserts.

Kennametal's I.C.E. style Blade-Savers & Curb Guards



WHY USE BLADE SAVERS:

- You know your blades don't wear evenly. Blade savers enable you to strategically reinforce the high wear areas of a plow blade arrangement, to balance the wear across the entire length of the blade moldboard. We have styles available that can be used with either standard steel or tungsten carbide insert style blades. The Blade Savers mount directly over your blade/cutting edge using the same boltholes.
- Blade savers also extend the overall wear life of the blade. Because the wear is balanced you get optimal life out of the base blade. You don't need to scrap unused portions because of uneven wear. The added thickness of the blade saver also provides more surface area to reduce down pressure on the blade providing increased wear life where you need it.
- Reduce or eliminate the need for moldboard shoes.
- Reduce downtime by reducing how often you need to change blades.

WHY USE CURB GUARDS:

- Curb Guards protect the ends of the moldboard from damage and wear resulting from contact with curbs and concrete barriers. A relatively small investment in a Curb Guard can prevent costly, major moldboard repair.

WHY USE KENAMETAL BRAND BLADE SAVERS AND CURB GUARDS:

- **Superior materials:** Kennametal Blade Savers and Curb Guards utilize **tungsten carbide** for wear resistance, which is significantly harder than a typical chrome carbide hardfacing or the hardened steels which are utilized in competitive products.
- **Superior design:** Kennametal Blade Savers incorporate our patented I.C.E. (Isolated Carbide Edge) insert technology. The I.C.E. design uses "bullet" shaped inserts in individual pockets, separated by tough steel to greatly improve breakage resistance.
- The I.C.E. edge design is more aggressive than a flat edge, and enables you to penetrate hard packed ice and snow quickly. Competitive models can be bulky and blunt, causing the plow to ride over rather than cut in to hard pack.
- The radiused "curb side" portion of Kennametal curb guards feature our exclusive KenCast material. KenCast is composed of wear resistant tungsten carbide cast into a tough and wear resistant steel matrix. The entire outer edge of the guard is protected by tungsten carbide so you'll have carbide wear you need it, no matter what the cast angle of your plow is. The radiused edge design is beefier than wrap around styles, which have thin metal at the most critical areas.
- The boltholes in our Curb Guards are countersunk on both faces. This enables them to be used on either the right or left hand sides of the moldboard simply by turning them over.
- **Superior Quality and Service:**
- Our Guards and Blade Savers are available in the most popular sizes and bolt patterns.
- You can order with confidence because the products are backed by Kennametal- the industry leader for high quality carbide blades and accessories.
- 100% MADE IN USA

Presenting

Kennametal I.C.E. Series™ Center and End Blade Savers featuring genuine Kennametal tungsten carbide at the point of impact — for ultimate wear resistance and moldboard protection.

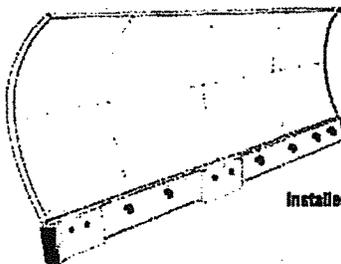
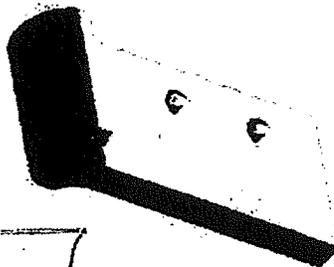
- Position at the highest wear areas of your moldboard to ensure substantially improved blade performance and a straight edge, in even the hardest-packed ice and snow.
- Simply mount over your blades, on either side of the moldboard, using the same bolt holes.
- Vastly superior to competitive chrome-carbide hardfaced or hardened-steel offerings.
- Eliminates need for moldboard shoes.
- Dome-shaped (no sharp corners to chip), individually spaced carbide inserts deliver maximum breakage defense.
- End model incorporates KenCast™ tungsten carbide material to safeguard the blade end from curb contact, saving you on replacement inventory and labor — no matter the cast angle of your plow.
- Available in a wide array of sizes and bolt patterns to fit virtually all plow and blade designs.

Drastically reduce downtime by extending blade life!



I.C.E. Center Blade Saver

I.C.E. End Blade Saver



Installed Blade Savers

I.C.E. Blade Savers • Ordering Information

part number	blade height	hole spacing	gauge line	length	bolt size
End Blade Savers 2-Bolt Styles					
2040067	5"	3-3"	1.5"	10.5"	5/8"
2040068	5"	3-3"	1.5"	10.5"	3/4"
2040069	6"	3-3"	1.5"	10.5"	5/8"
2040090	6"	3-3"	1.5"	10.5"	3/4"
2040091	6"	3-3"	2"	10.5"	5/8"
2040092	6"	3-3"	2"	10.5"	3/4"
2040123	8"	3-3"	1.5"	10.5"	5/8"
2040124	8"	3-3"	1.5"	10.5"	3/4"
2040125	8"	3-3"	2"	10.5"	5/8"
2402490	6"	2-8-2"	2"	14.5"	5/8"
End Blade Savers 3-Bolt Styles					
2402494	6"	3-3-12-2.25"	2"	22.5"	5/8"
2402495	6"	3-3-12-2.25"	1.5"	22.5"	5/8"
2402485	6"	3-3-12-2.25"	1.5"	22.5"	3/4"
2402488	6"	3-3-12-2.25"	2"	22.5"	3/4"
2457130	8"	3-3-12-2.25"	1.5"	22.5"	5/8"
3556530	5"	3-3-12-2.25"	1.5"	22.5"	5/8"
Center Blade Savers					
2038043	6"	3-3-9-3-3"	1.5"	21"	5/8"
2040864	6"	3-3-9-3-3"	2"	21"	5/8"
2035512	8"	3-3-12-3-3"	1.5"	24"	5/8"
2037952	6"	3-3-12-3-3"	2"	24"	5/8"
2037951	5"	3-3-12-3-3"	1.5"	24"	5/8"
2038044	6"	3-3-3"	1.5"	9"	5/8"
2038045	8"	3-3-3"	1.5"	9"	5/8"
2038046	6"	3-12-3"	1.5"	18"	5/8"
2042966	8"	3-3-12-3-3"	1.5"	24"	5/8"

NOTE: End blade saver bolt holes countersunk on both sides of blade to facilitate use as a left-hand or right-hand part.

Blade is 1" thick on all blade savers.

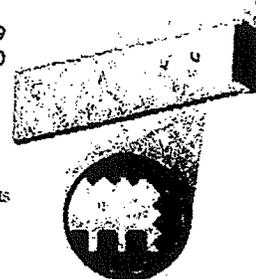
To choose the optimum blade saver for your application, simply match blade height, hole spacing, hole size, and gauge to the cutting edge you need to protect. Blade savers are available in various lengths to enable you to safeguard any size area on your main cutting-edge assembly.

Custom hole-spacing available.

3/4 Bolt - Kenn Part# 5528929
5/8 Bolt - Kenn Part# 3556530

Now available in a 3-bolt-hole design for more secure fastening.

Features I.C.E. style inserts to resist breakage.





KENNAMETAL INC.
MINING AND CONSTRUCTION
DIVISION

RECOMMENDED SPECIFICATIONS
FOR
Curb Guards

The following specifications have been developed by Kennametal Inc. to describe Curb Guards. These specifications are recommended for use by State and Municipal Highway Departments to procure and inspect these products to insure they receive a superior quality product. The parts are to be manufactured according to the attached drawings using materials conforming to the following:

1. BLADE

- 1.1 The main flat blade portion shall be fabricated using 1" thick flat hot-rolled finished steel to meet or exceed specifications for A36 or 1020 type steels.
- 1.2 Punching shall be 11/16" square holes with countersink to receive 5/8" diameter plow bolts. Location and spacing of the holes shall be as specified by the user. For "Standard Highway Punch" style spacing refer to the attached drawing. The holes of the Curb Guard will be countersunk on both sides so that the part can be used for either a "right hand" or "left hand" part.
- 1.3 Center of boltholes shall be in line within 1/32" of established horizontal centerline and 1/16" of established vertical centerline.

2. KENCAST WEAR GUARD

The end guard to be made of Kennametal Kencast material—a composite combining the exceptional hardness of Kennametal cemented tungsten carbide with the toughness of air-hardening steel to resist wear in severe operating conditions. The type and amount of steel matrix and tungsten carbide in a composite varies.

2.1 The ranges for the composite ingredients:

Tungsten Carbide	86-91 HRA
Matrix Steel (bonded to carbide)	52-58 HRC
Base Steel	38-50 HRC

2.2 Air-hardening (Cr-Ni-Mo) steel is used. During the metallurgical bonding, the matrix steel (around the carbide particles) alloys with tungsten and cobalt.

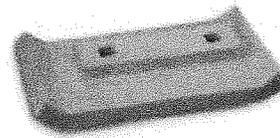
2.3 Tungsten carbide granules are approximately ¼-inch-thick in the wear surface.

2.4 Steel Matrix (figures are weight%)

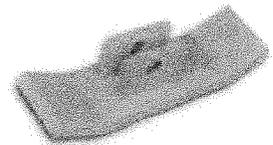
Carbon	.28-.35	Nickel	1.0-2.0
Manganese	1.5-2.0	Chrome	.80-1.2
Silicon	1.3-1.7	Molybdenum	.20-.30
Aluminum	.08-.15		

Tungsten Carbide-Reinforced Snowplow Shoes

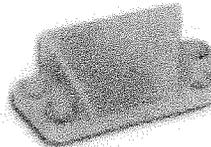
- Improve blade life.
- Prevent blade dig-ins during road-shoulder work.
- Protect moldboards against premature failure.
- Kennametal's unique high-hardness KenCast™ material provides unsurpassed wear resistance versus competitive mild-steel/brazed designs.
- Custom shoes also available — just provide us your drawing or a sample.



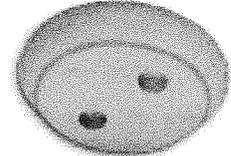
KCWB-0167
1012483



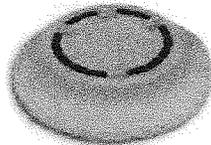
PBS-1212*
1012590



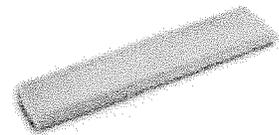
KCWB-0062
1012434



KCWB-0295
1012582



KCWB-0154
1012472



KCWB-0187
1012493

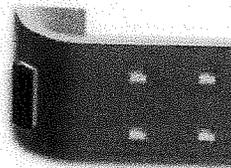
Extend snowplow blade life by as much as 30%!

Use long-life, weldable KenCast bars to rebuild your worn all-steel shoes.

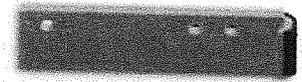
*Please specify hole size, bracket thickness, distance from shoe top to center of hole, and distance between brackets. Other shoes are available upon request. To ensure proper fit, we need to know the specific style, make, model number, hole spacing, and hole size.

Tungsten Carbide-Reinforced Curb Guards

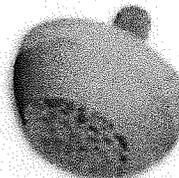
- Guard moldboard ends and blades from extensive impact and abrasion.
- Feature the same tough KenCast material as on our I.C.E. Series™ blade guards.
- Offered in easy-to-attach, easy-to-change wrap-around and mushroom-cap styles.



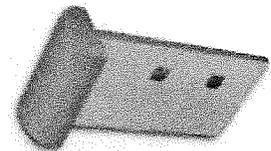
KCWB-0578**
3390176



KCWB-0574**
3336844



KCWB-0145
1012465



KCWB-0307-A
1012592
(for standard 12" punching)
KCWB-0307-B
2426053
(for 8" punching)

Inexpensive insurance against major moldboard repair!

**Used with blades punched 1-1/2" from blade top to center of hole. Our curb bumpers fit most snowplow makes and models.

KÜPER

KÜPER

Kueper Plow Blade Specification

TUCA SX Wave Snowplow Cutting Edge

Presented by Kueper North America, LLC

2012

About this Specification

© 2012 Kueper North America, LLC. All Rights Reserved. All other brands and names may be trademarks of their respective owners and are used for explanation without intent to infringe.

1. Description:

This specification covers snowplow blades with tungsten carbide inserts free floating in vulcanized rubber with the configuration of –STEEL-RUBBER-STEEL WITH CARBIDE INSERTS–RUBBER - STEEL.

2. Materials:

2.1 Front Steel Plate:

Wear resistant steel with an average hardness of 400 HB, matching the wear and hardness specifications of Dillidur 400 V.

- i. **Front Steel Plate thickness: 8 mm**
- ii. **Hardness: 400 HB (43 Rockwell C, 114 Rockwell B)**
- iii. **Tensile Strength: U.T.S. = 1300 MPa**
- iv. **Yield Point: Y.P. = 1000 MPa**
- v. **Tolerances according to specifications of Dillidur 400V.**
- vi. **Shape: Front plate to be formed in a “wave” shape in order to better deflect snow into the mold-board of the plow. Triangular openings as wear indicator.**

2.2 Back Steel Plate:

Wear resistant steel with an average hardness of 400 HB matching the specifications of Dillidur 400V.

- vii. **Back Steel Plate thickness: 8 mm**
- viii. **Hardness: 400 HB (43 Rockwell C, 114 Rockwell B) (tolerance ± 30 HB)**
- ix. **Tensile Strength: U.T.S. = 1300 MPa**
- x. **Yield Point: Y.P. = 1000 MPa**
- xi. **Tolerances according to specifications of Dillidur 400V.**

2.3 Rubber: The blade shall have a wear resistant rubber body, vulcanized between the two steel plates with tungsten carbide holders and inserts embedded within the rubber.

2.4 Tungsten Carbide Inserts:

- xii. **Tungsten carbide inserts shall be centrally embedded on the lower end of a steel plate (=steel carbide holder).**
- xiii. **The inserts shall be a high shock WC Grade of tungsten and shall meet Virgin Tungsten Carbide quality specifications and the following requirements:**
 1. **Hardness: 1100-1300 HV10 ISO 3878**
 2. **Bending Strength: 2700 N/mm (squared) ISO 3327**
 3. **Average Grain Size: 5 – 7 μ m**
 4. **Density: 14,40 g/cm³ ISO 3369**
 5. **Insert Dimensions:**
 - a. **Height: 17,5 mm**
 - b. **Width, 8 mm**

6. The groove for the carbide shall be milled in the center of the steel carbide holder. The groove shall be milled to a depth that will allow the inserts to be brazed flush with the bottom edge of the carbide holder. Each insert shall be max. two-inches nominal length.

7. The inserts shall be brazed on all contact surfaces consistent with sound brazing practice with no evidence of voids or use of shims. Brazing shall be of such strength and quality as required to prevent movement or loss of the inserts during use.

3. Finished Blades

3.1 Overall blade dimensions:

1. Blade Thickness in wear area: 40 mm (tolerance \pm 2mm)
2. Overall Blade Height: 187 mm (tolerance \pm 2mm)

3.2 Physical Requirements. All blades shall be straight and free from flaws and injurious defects, and shall have workmanlike finish.

3.3 Tungsten carbide holders shall be placed free-floating in the rubber body. Thus there has to be a gap between two holders. In length carbide inserts should cover no less than 90% of the total length of the blade.

3.4 Punching shall be square or round holes. Details, location, and spacing of the holes shall be to customer requirements.

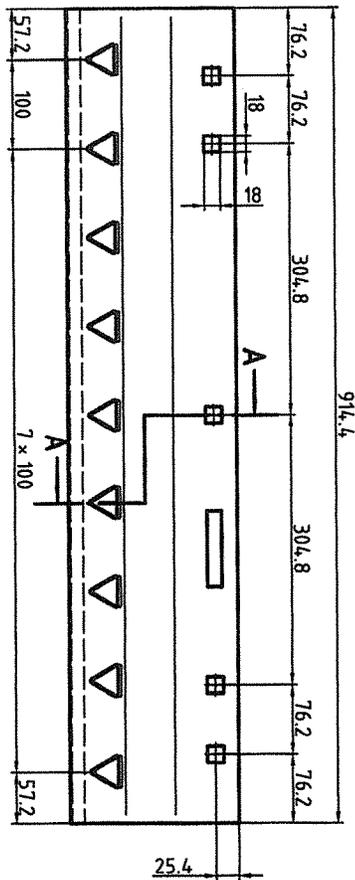
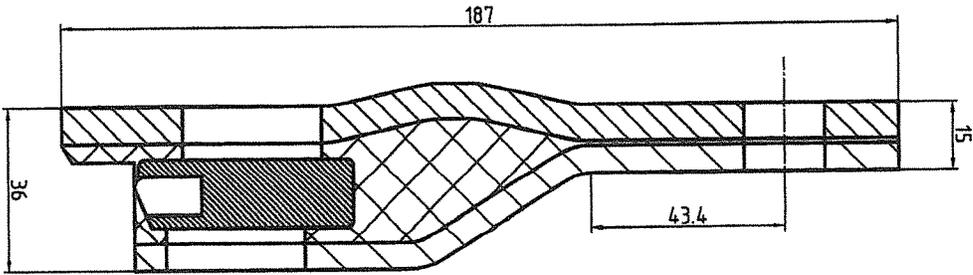
3.5 Blade punching will be of such accuracy, both for the spacing between holes and for the spacing between the end hole and the end of the blade, that the blades will fit the moldboards, thus making the blade sections interchangeable.

3.6 Blades shall be painted and any paint used to coat the blades shall be dry prior to shipment and shall not smear or track during handling.

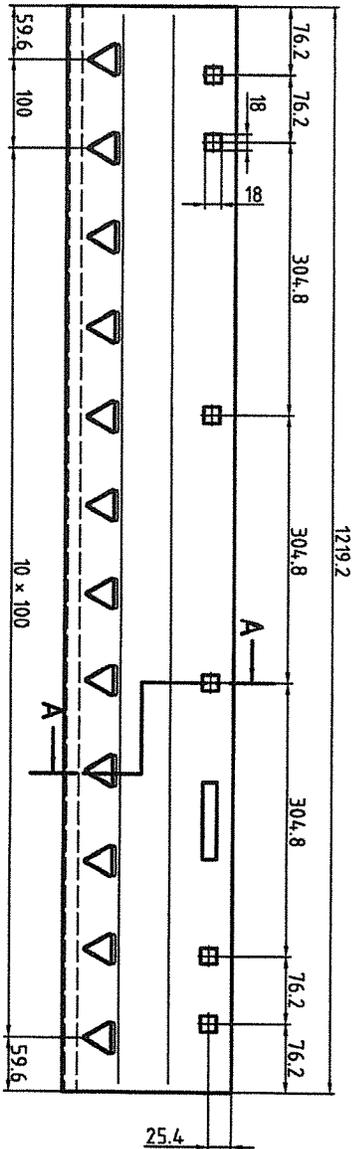
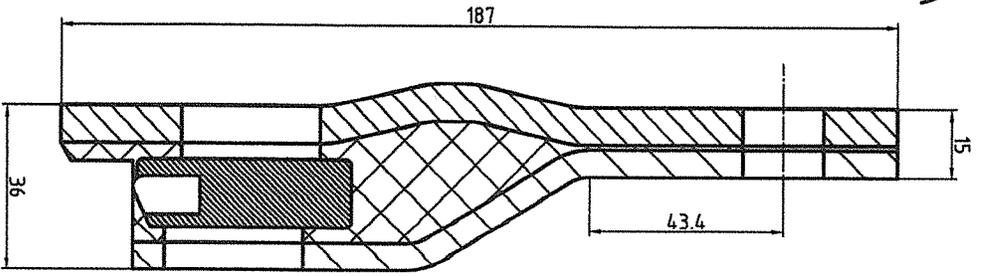
3.7 Each blade element should provide the name of the manufacturer and a serial number for quality control.

3.8 Finished blade sections shall be provided in units of three (3) feet, four (4) feet.

3.9 The finished blade section shall be fully assembled by the manufacturer and require no additional assembly, no additional parts or hardware, and no mounting hardware other than bolts and nuts.



Gas. Gew.	kg	KÜPER®				TUCA SX 36		Auftr.-Nr.	
Einwaage	kg							drawing-no.	W1391 - 3
Stahlgewicht	kg							article-no.	34855836X
H.Z.	min	Datum	Name	Gez.	Gepr.	Length	weight	Ers. für	
Einwaage (60 Shore)	kg	18.09.2008	Stöckle			3 ft	25,3 kg	Ursprung	W1343 - 4
Einwaage (90 Shore)	kg	Maßstab	1:5						
Änderung c:									
Änderung b:									
Änderung a:									



Gas. Gew.	kg	KÜPPER®		TUCA SX 36		Auftr.-Nr.	
Einwaage	kg					drawing-no.	W1392 - 3
Stahlgewicht	kg	min.	Datum	Name	length	4 ft	
H.Z.		18.09.2008			weight	33.7 kg	
Einwaage (60 Shore)	kg	Gepr.	Maßstab				article-no.
Einwaage (90 Shore)	kg	1:5					34865936X
Einwaage (Ers. für)							Ers. für
Änderung c:							Ur-sprung
Änderung b:							W1343 - 4
Änderung a:							

KÜPER

KÜPER

Kueper Plow Blade Specification

TUCA SX Underbody Scraper Cutting Edge

Presented by Kueper North America, LLC

2013

About this Specification

© 2012 Kueper North America, LLC. All Rights Reserved. All other brands and names may be trademarks of their respective owners and are used for explanation without intent to infringe.

1. Description:

This specification covers snow plow blades for underbody plows with carbide inserts free floating in vulcanized rubber with the configuration of STEEL-RUBBER-CARBIDE-RUBBER-STEEL.

The blades are manufactured by Kueper GmbH & Co. KG in Bochum, Germany

2. Materials

2.1.1 Front Steel Plate: Wear resistant steel with an average hardness of 400HB

2.1.2 Plate thickness of 8mm

2.1.3 Hardness: 400HB (43 Rockwell C, 114 Rockwell B)

2.1.4 Tensile Strength: U.T.S. = 1300 MPa

2.1.5 Yield Point: Y.P. = 1000 MPa

2.1.6 Tolerances according to specification of Dillidur 400V

2.1.7 Triangular openings as wear indicator

2.2.1 Back Steel Plate: Wear resistant steel with an average hardness of 400HB

2.2.2 Plate thickness of 6mm

2.2.3 Hardness: 400HB (43 Rockwell C, 114 Rockwell B)

2.2.4 Tensile Strength: U.T.S. = 1300 MPa

2.2.5 Yield Point: Y.P. = 1000 MPa

2.2.6 Tolerances according to specification of Dillidur 400V

2.3.1 Rubber: The blade shall have a wear resistant rubber body, vulcanized between two steel plates with tungsten carbide holders inserts embedded within the rubber.

2.4.1 Tungsten Carbide inserts:

2.4.2 Tungsten carbide inserts shall be centrally embedded on the lower end of a steel plate (= steel carbide holder)

- 2.4.3 The inserts shall be high schock EC Grade of tungsten and shall meet Virgin Tungsten Carbide quality specifications and the following requirements
- 2.4.4 Hardness: 1100-1300 HV10 ISO 3878
- 2.4.5 Bending Strenght: 2700 N7mm (squared) ISO 3327
- 2.4.6 Average Grain Size: 5 – 7 μ m
- 2.4.7 Inserts Dimension: a. Height 17,5mm b. Width 8mm
- 2.4.8 The groove for the carbide shall be milled in the center of the Steel carbide holder. The grove shall be milled to a depth that will allow the inserts to be brazed flush with the bottom edge of the carbide holder.
- 2.4.9 The inserts shall be brazed on all contact surfaces consistent with sound brazing practice with no evidence of voids or use of shims. Brazing shall be of such strength and quality as required to prevent movement or loss of the inserts during use.

3. Finished Blades

- 3.1.1 **Overall blade dimensions:**
- 3.1.2 Overall blade height 125mm (tolerance \pm 2mm)
- 3.1.3 Overall blade thickness 36mm (tolerance \pm 2mm)
- 3.1.4 Overall blade length according to customer and plow requirements
- 3.1.5 The hole position and design must be according to customer and plow requirements

4. Physical Requirements

- 4.1.1 All blades shall be straight and free from flaws and injurious defects, and shall have workmanlike finish.
- 4.2.1 Tungsten carbide holders shall be placed free-floating in the rubber body. Thus there has to be a gap between two holders in order for the holders to act independently of one another and "flex". In length carbide inserts should cover no less than 90% of the total length of the blade.

4.3.1 Punching shall be square or round holes. Details, location, and spacing of the holes shall be to customer requirements.

4.4.1 Blade punching will be of such accuracy, both for the spacing between holes and for the spacing between the end hole and the end of the blade, that the blades will fit the moldboards, thus making the blade sections interchangeable.

4.5.1 Blades shall be painted red/orange and any paint used to coat the blades shall be dry prior to shipment and shall not smear or track during handling.

4.6.1 Each blade element should provide the name of the manufacturer and a serial number for quality control.

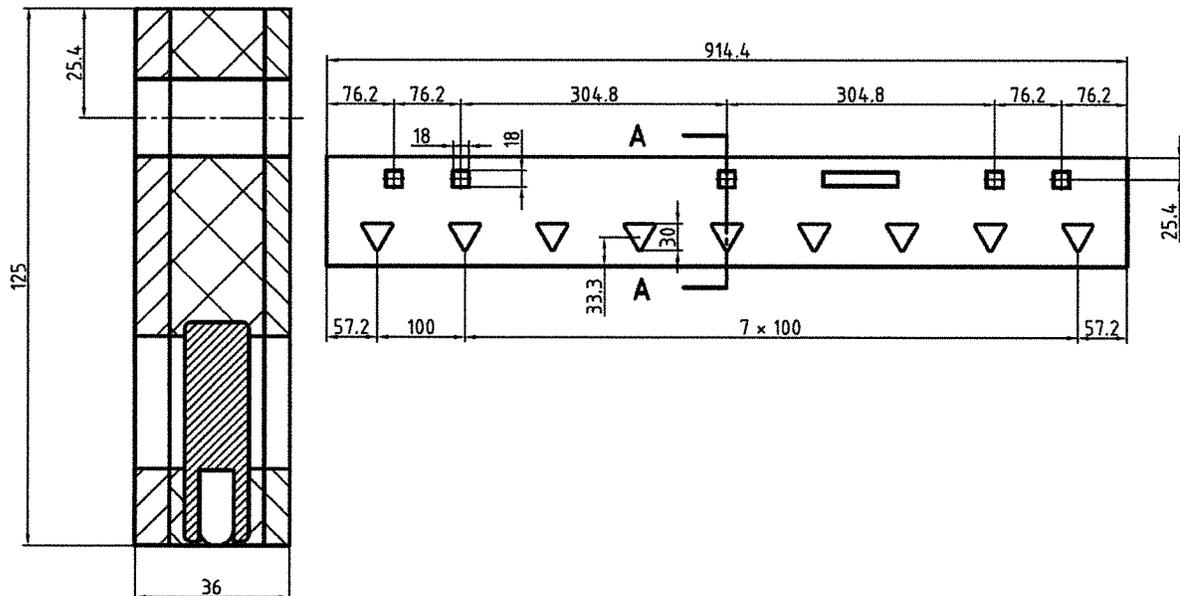
4.7.1 Finished blade sections shall be provided in units of three (3) feet, four (4) feet.

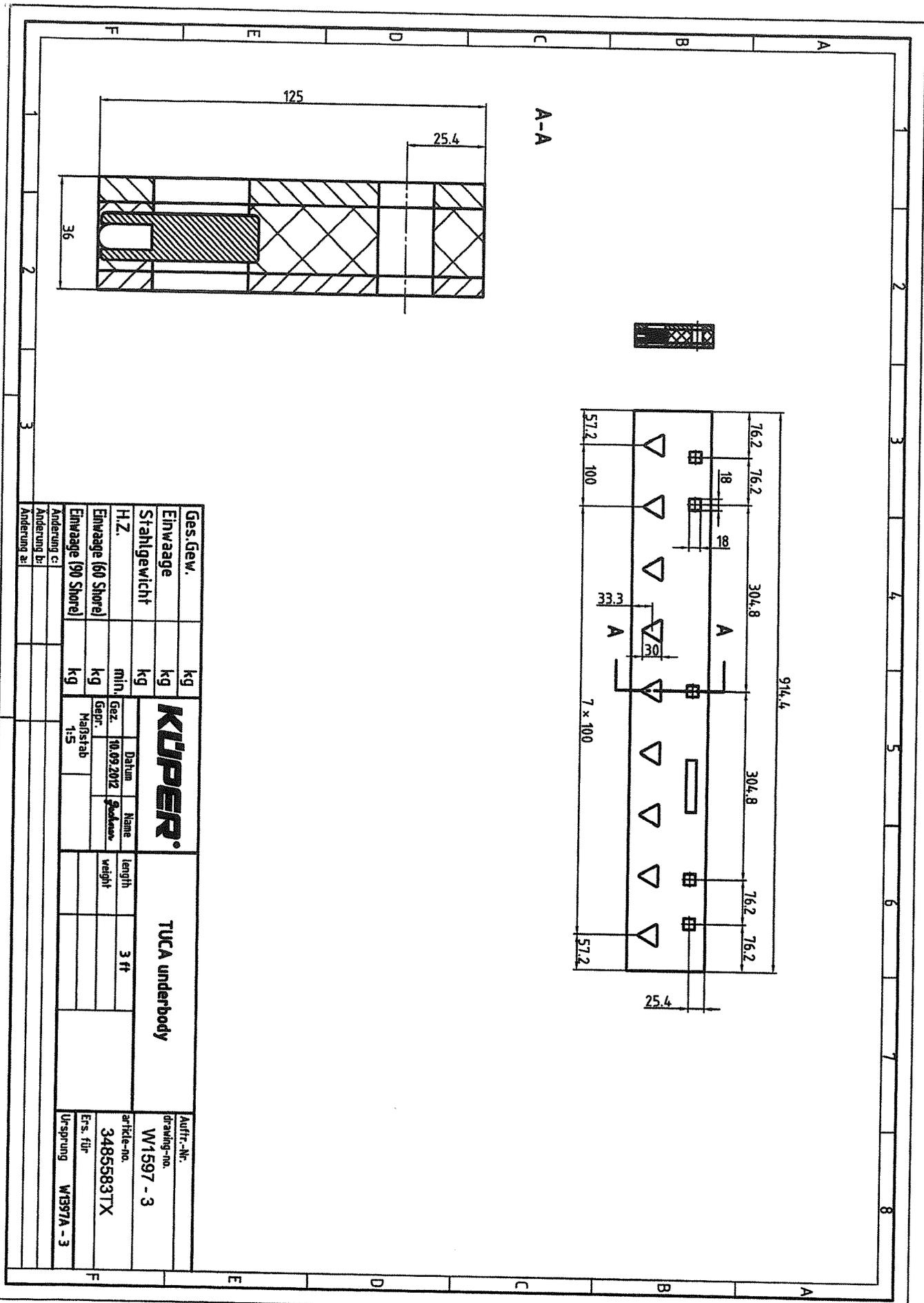
4.8.1 The finished blade section shall be fully assembled by the manufacturer and require no additional assembly, no additional parts or hardware, and no mounting hardware other than bolts and nuts

5. Drawing

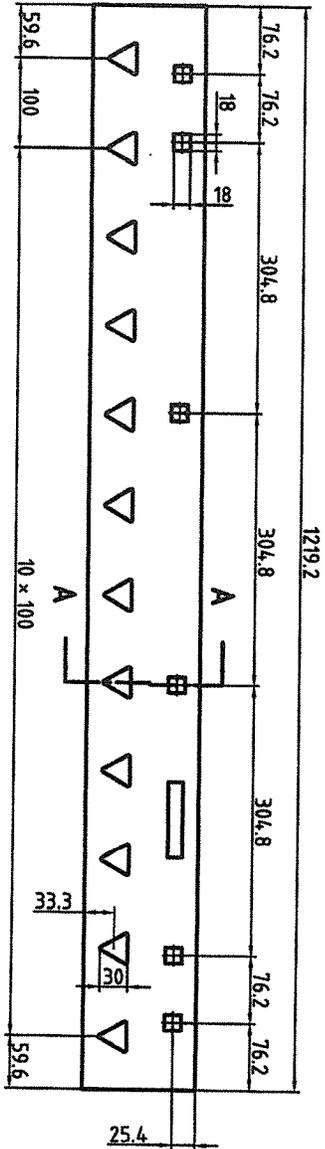
5.1.1 The drawing displays only the blade measurements in mm, the inlay design and positions are only for presentation purposes.

TUCA SX Underbody 3' example

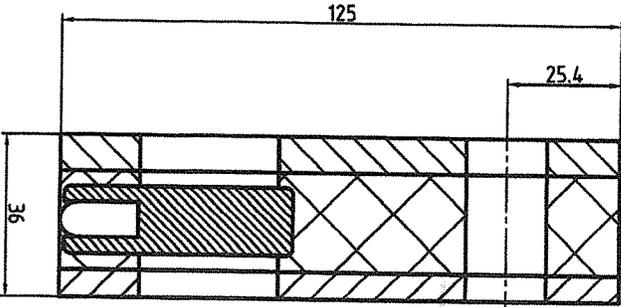




Gas. Gew.	kg	KUPER®				TUCA underbody		Auftr.-Nr.	W1597 - 3
Einwaage	kg							Datum	10.09.2012
Strahlgewicht	kg	H.Z.	min.	Gapf.	1:5	length	3 ft	Ers. für	W1397A - 3
Einwaage (60 Shore)	kg	Einwaage (90 Shore)	kg			weight		Ursprung	W1397A - 3
Änderung c1									
Änderung b1									
Änderung a1									



A-A



Gas. Gew.	kg																				
Einwaage	kg																				
Strahlgewicht	kg																				
H.Z.	min.																				
Einwaage (60 Shore)	kg																				
Einwaage (90 Shore)	kg																				
Änderung c																					
Änderung b																					
Änderung a																					

KUPER®

TUCA underbody

Autfr.-Nr. W1598 - 3
 drawing-no. W1598 - 3
 article-no. 3485593TX
 Ers. für Ursprung W1397A - 3

KÜPER®

Snowplow blades

Tuca SX Underbody



High-quality Blades for Top Performance on Underbody Style Plows

THE STANDARD COMBINATION BLADE FOR OVER 20 YEARS

Combination Underbody Blades

The Tuca SX Underbody employs similar components and construction as our Tuca SX front style plow blades incorporating tungsten carbide wear components within flexible rubber and wear resistant plates in a size and format suited for all underbody style plows. Proven for over 20 years across the world, these combinations provide extreme longevity and superb cleaning of the road surface in addition to the significant reduction in vibration and noise that operators have come to expect from Kueper Plow Blades. Our proven products are subject to constant quality monitoring allowing us to maintain the highest standards when it comes to the development and optimization of our products.

Tuca SX Underbody Features

- ✓ Extremely durable
- ✓ For the toughest jobs
- ✓ Excellent scraping properties
- ✓ No damage to the road surface
- ✓ For underbody snow plows
- ✓ Can be used on all paved road surfaces.

+600 %

Conventional Carbide Blade

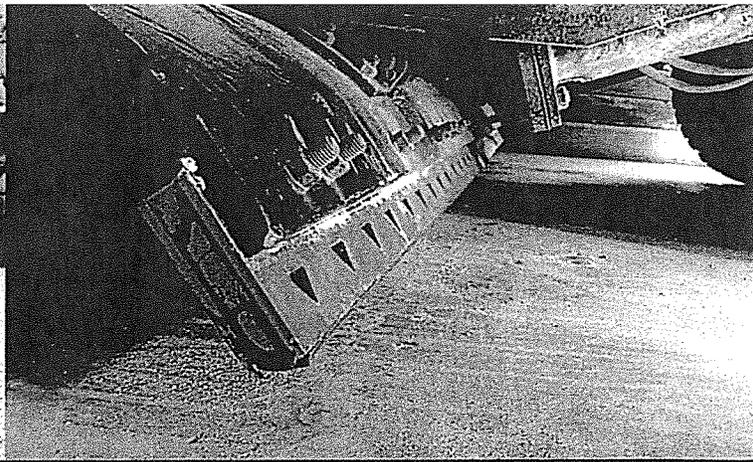
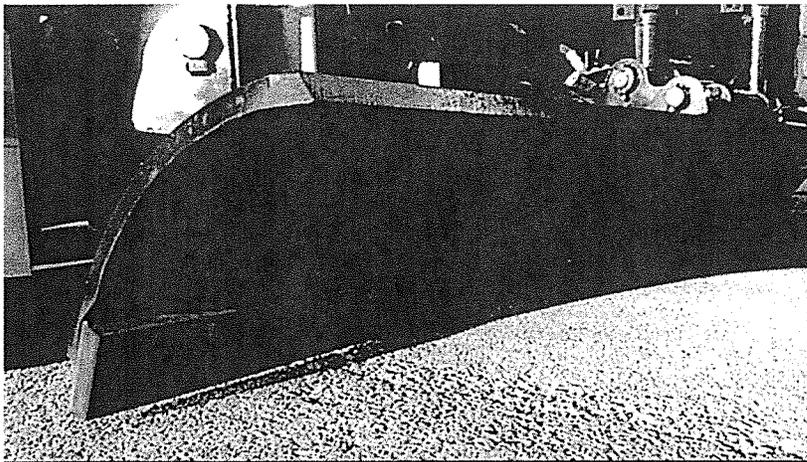
Tuca SX Underbody

Areas of Use



Highway Country City
Road

* Not for use on gravel or dirt roads.



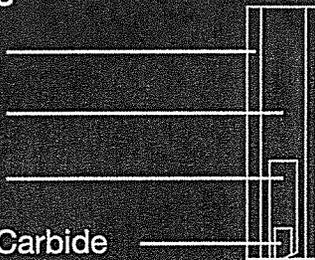
Materials

Steel

Rubber

Steel

Tungsten Carbide



Tungsten Carbide

A chemical compound consisting of equal parts tungsten and carbon. It is characterized by its extreme hardness, which is nearly as high as that of diamonds. This material stands up to the toughest loads

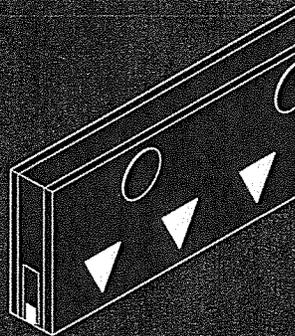
Rubber

This grade of rubber was developed specifically to meet demanding road conditions. This extremely wear-resistant, flexible and elastic material effectively adapts to changes in the road surface.

Steel

This special wear-resistant steel is water-hardened to 400 Brinell and has a tensile strength of approx. 195,000 psi. It stands up to the toughest jobs.

Technology



The construction of the blades features a core of carbide inlays embedded in rubber, keeping the blades more elastic and flexible. This greatly reduces vibration and noise and helps keep the blades from jumping or "chattering."

Mounting and Operating Instructions

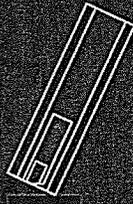


0°

Best
Scraping



15°



25°

Maximum

Driving Direction



- Use only grade 8 mushroom head carriage bolts and appropriate grade 8 locking hardware
- Torque to 150 foot pounds maximum
- May be used at any angle of operation between 0° and 25° angled backward.
- Sections are standard 12" punch in 3' & 4' (custom and unique punches and sizes available)
- Sections bolt directly to moldboard – no adapters or accessories required
- Down pressure 300-500 lbs maximum

WEAR TECHNOLOGY

Kueper North America, LLC, 171 Church Street, Suite 300
Charleston, SC 29401, info@kueperblades.com

843.345.6788
www.kueperblades.com

KÜPER®

Snowplow blades

Tuca SX Wave



High-quality flexible carbide snowplow blades: Tuca SX Wave

THE SUPER COMBINATION BLADE FOR ALL TYPES OF SNOWPLOWS AND MULTIPLE ROAD SURFACES*.

New standards in snow removal!

A state-of-the-art, high performance blade designed for long-term use. Once again, Küper is setting new standards in snow removal with the Tuca SX Wave. Detailed requirements analysis and constant advances in blade development lead to trailblazing product innovations like the patented Küper Wave Technology which uses a curved profile to remove snow without resistance. Separate tungsten holders embedded in rubber and vulcanized between front and rear Hardox 400 steel plate make the TUCA SX incredibly durable. The result is a combination blade with carbide which can stand up to multiple road surfaces encountered while plowing, effectively clearing even the most extreme roads without damaging the surface.

+600 %

Conventional Carbide Blade

TUCA SX Wave

Tuca SX Features

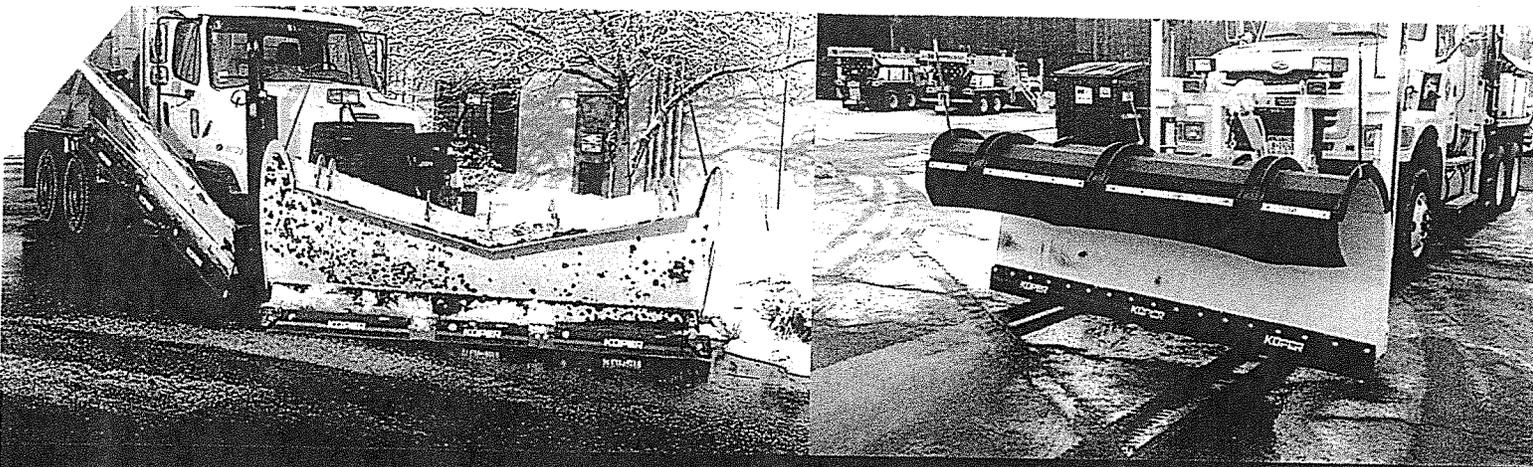
- ✓ Wave Technology
- ✓ Extremely durable
- ✓ Tungsten carbide inlays
- ✓ For the toughest jobs
- ✓ Excellent scraping properties
- ✓ Stands up to obstacles and uneven roads
- ✓ No damage to the road surface
- ✓ Can be used on all road surfaces except dirt and gravel.

Areas of Use



Highway Country City
Road

* Not for use on gravel or dirt roads.



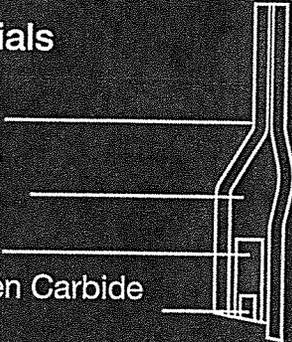
Materials

Steel

Rubber

Steel

Tungsten Carbide



Tungsten Carbide

A chemical compound consisting of equal parts tungsten and carbon. It is characterized by its extreme hardness, which is nearly as high as that of diamonds. This material stands up to the toughest loads.

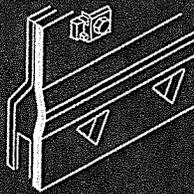
Rubber

These grades of rubber were developed specifically to meet demanding road conditions. This extremely wear-resistant, flexible and elastic material effectively adapts to changes in the road surface.

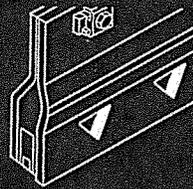
Steel

This special wear-resistant steel is water-hardened to 400 Brinell and has a tensile strength of approx. 195,000 psi. It stands up to the toughest jobs.

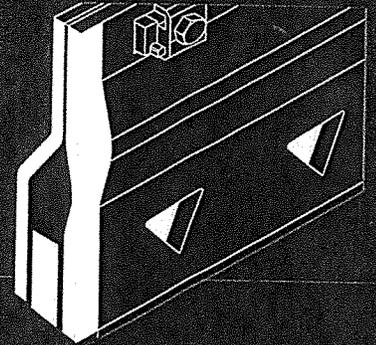
Technology



The Küper Wave Technology diverts snow across a curved profile for optimal removal. The snow is moved over the mounting elements without resistance.



The Küper Cooling System features special openings to keep the blade from heating up.



Mounting and Operating Instructions



0



15



35

Driving Direction



- Use only grade 8 mushroom head carriage bolts and appropriate grade 8 locking hardware
- Torque to 150 foot pounds maximum
- May be used at any angle of operation between 0 and 35 degrees
- Sections are standard 12" punch in 3' & 4' (custom and unique punches and sizes available)
- Sections bolt directly to moldboard – no adapters or accessories required

WEAR TECHNOLOGY

Kueper North America, LLC, 171 Church Street, Suite 300
Charleston, SC 29401, info@kueperblades.com

843.345.6788
www.kueperblades.com