----
* INCH-POUND *

OO-C-2804
March 29, 1993
SUPERSEDING
MIL-C-28662C(YD)
21 December 1987

FEDERAL SPECIFICATION

CONVEYOR, BELT, PORTABLE, DED, GED, OR EMD

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 Scope. This specification covers portable, elevating-troughing, belt-type conveyors, powered by a diesel engine, gasoline engine, or electric motor. They are intended to be used to convey rock, sand, and gravel at a mineral products facility or rock crusher site.

1.2 Classification. The conveyors shall be of the following classes, types, and sizes as specified (see 6.2).

	PIN code
Class I - Diesel engine driven	1
Class II - Gasoline engine driven	2
Class III - Electric motor driven	3
Type A - 100 tons per hour (tph) minimum (18-inch belt)	A
Type B - 300 tph minimum (24-inch belt)	B
Type C - 500 tph minimum (30-inch belt)	C
Size 1 - 40 feet long	1
Size 2 - 50 feet long	2
Size 3 - 60 feet long	3
Size 4 - 70 feet long	4

--
Beneficial comments (recommendations, additions, deletions) and any pertinent
*data which may be of use in improving this document should be addressed to: *
*Commanding Officer (Code 156), Naval Construction Battalion Center, *
*621 Pleasant Valley Road, Port Hueneme, CA 93043-4300, by using the *
*Standardization Document Improvement Proposal (DD Form 1426) appearing at *
*the end of this document or by letter. *
--

FSC 3910

1.2.1 Part or Identification Number (PIN). A PIN has been established for use to identify the classified item for acquisition (see 1.2 and 6.2.1).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Federal Specifications

MMM-A-260 - Adhesive, Water-Resistant (For Sealing Waterproofed Paper)
PPP-P-40 - Packaging and Packing of Hand Tools
PPP-T-60 - Tape, Packaging, Waterproof
PPP-B-601 - Boxes, Wood, Cleated-Plywood
PPP-B-621 - Box, Wood, Nailed and Lock-Corner
PPP-B-1055 - Barrier Material, Waterproofed, Flexible
TT-V-119 - Varnish, Spar, Phenolic-Resin
TT-P-664 - Primer, Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant
VV-F-800 - Fuel Oil, Diesel

Federal Standard

FED-STD-123 - Marking For Shipment (Civil Agencies)

Military Specifications

MIL-C-104 - Crates, Wood; Lumber and Plywood Sheathed, Nailed and Bolted
MIL-P-116 - Preservation, Methods of
MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible
MIL-S-196 - Support Items, Accessories, and Kits, Mechanical, Packaging of
MIL-T-5624 - Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-E-10062 - Engines, Preparation for Shipment and Storage of
MIL-V-13811 - Varnish, Waterproofing, Electrical, Ignition
MIL-E-16298 - Electric Machines Having Rotating Parts and Associated Repair Parts, Packaging of
MIL-V-62038 - Vehicle, Wheeled, Preparation For Shipment and Storage of

Military Standards

MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-209 - Slinging and Tiedown Provisions for Lifting and Tying Down Military Equipment
MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking, and Waterproofing, with Appropriate Test Methods

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.1.2 Other Government documents. The following other Government documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

Department of Transportation (DoT):

Federal Motor Carrier Safety Regulations

(Applications for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

2.2 Non-Government publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DODISS shall be the issue of the non-Government documents which is current on the date of the solicitation.

American National Standards Institute, Inc. (ANSI):

ANSI B20.1 - Safety Standard for Conveyors and Related Equipment

(Application for copies should be addressed to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036.)

American Welding Society (AWS):

AWS D14.3 - Welding Earthmoving and Construction Equipment

(Application for copies should be addressed to the American Welding Society, 550 N.W. LeJeune Road, P.O. Box 351040, Miami, FL 33135.)

ASTM:

ASTM A36/A36M - Specification for Structural Steel
ASTM D3951 - Packaging, Commercial
ASTM D3953 - Steel Flat & Seals Strapping

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

National Electrical Manufacturers Association (NEMA):

ICS-2 - Industrial Control Devices, Controllers and Assemblies
ICS-6 - Enclosure for Industrial Controls and Systems
MG-1 - Motors and Generators
WD-6 - Wiring Devices - Dimensional Requirements

(Application for copies should be addressed to the National Electrical Manufacturers Association, 2101 L Street, N.W., Washington, DC 20037.)

National Fire Protection Association (NFPA):

70 - National Electrical Code

(Application for copies should be addressed to the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.)

Society of Automotive Engineers, Inc. (SAE):

SAE J534 - Lubrication Fittings

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

Tire and Rim Association, Inc. (TRA):

TRA Yearbook

(Application for copies should be addressed to the Tire and Rim Association, Inc., 175 Montrose West Avenue, Suite 150, Copley, OH 44321.)

Underwriters Laboratories, Inc. (UL):

UL 62 - Flexible Cord and Fixture Wire
UL 498 - Attachment Plugs and Receptacles

(Applications for copies should be addressed to the Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.)

(Non-Government standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The conveyor shall consist essentially of a conveyor frame, mounted on a wheeled axle assembly, idlers, conveyor belt, hydraulic elevating mechanism, receiving hopper, and an engine or motor mounted in or above the conveyor frame. The conveyor shall include all the necessary attachments for conveying loose bulk materials such as sand, gravel, crushed rock, coal, etc.

3.2 First article. When specified in the contract or purchase order (see 6.2), a sample shall be subjected to first article inspection (see 4.2.1 and 6.5).

3.3 Safety. All parts subject to high operational temperatures, speed, or of nipping, pinching or electrical shock potential, that are of such a nature or are so located as to be or become a hazard to the safety of the operating personnel, shall be insulated or grounded, enclosed or guarded to the extent necessary to eliminate the hazard, in conformance with ANSI B20.1.

3.4 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specified.

3.5 Standard commercial product. The conveyor shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer’s standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer’s standard commercial product, shall be included in the conveyor being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer’s catalogs, or brochures, and represents the latest production model.

3.6 Performance. The conveyor shall operate satisfactorily when elevated at any angle from 12 degrees (o) through 22o from the horizontal. The belt speed shall be not less than 260, nor more than 440 feet per minute. The system shall be capable of delivering, at the specified rates (see 1.2), bulk material such as crusher run aggregate weighing 100 pounds per cubic foot, when operating at a 21o angle. A means shall be provided to prevent belt roll back.

3.7 Design and construction. The equipment shall be designed and constructed to facilitate field maintenance. All adjustment and replaceable accessories shall be readily accessible. With conveyor at a 12o elevated angle and a maximum belt load, the frame lateral and vertical deflection (D, in inches) between supports shall not exceed 1/360 (0.36 inch in 10 linear feet). The frame deflection shall return to neutral when the load is removed.

3.7.1 Conveyor frame. All operating parts of the conveying system shall be mounted on the conveyor frame. The frame shall be a lattice-type truss fabricated of structural steel angle conforming to ASTM A36/A36M. The top cord members shall be not less than 2.5 by 2.5 by 0.25 inch steel angle. The bottom cord members shall be not less than 4 by 3 by 0.25 inch steel angle. Diagonal members shall be not less than 1.5 by 1.5 by 0.1825 inch steel angle. Vertical

and horizontal perpendicular braces shall be not less than 1.0 by 1.0 by 0.1825 inch steel angle.

3.7.2 Idlers. Troughing idlers shall have ball bearings or antifriction bearings and be of the 20o or 35o three unit troughing design. Return rollers shall all be of the ball or antifriction bearing design. Bearing design shall prevent entry of dust, sand, or moisture.

3.7.3 Belt. The belt shall be fabricated of heavy-duty, two-ply rubber of synthetic or rubberized material, and be capable of withstanding the specified loads (see 3.6), for continuous operating conditions.

3.7.4 Receiving hopper. The receiving hopper shall be the manufacturer's standard, gravity feed type. The hopper shall be of steel construction with rubber flashing to keep material centered on the belt.

3.7.5 Hydraulic hoist system. The conveyor shall be equipped with a hand operated hydraulic system capable of raising and lowering the conveyor throughout the range specified in 3.6. Hydraulic rams shall be shielded to prevent damage from falling particles or other environmental conditions. A positive mechanical lock with a locking pin shall be provided to prevent the conveyor frame from lowering.

3.7.6 Conveyor power. As specified in the contract (see 6.2), the conveyor shall be powered by an internal combustion engine or electric motor as specified or at the manufacturer's option. As specified in the contract (see 6.2), the power shall be transmitted to the conveyor belt through a combination of counter shafts, power take-off, V-belts, clutches, and gear reduction units, or through hydraulic pumps and motors, as specified or at the manufacturer's option.

3.7.6.1 Engine. The engine shall be the manufacturer's standard commercial engine. The power and speed rating of the engine shall be such that operation of the conveyor, under any of the requirements and tests specified herein, will not require horsepower (hp) in excess of the continuous hp rating of the engine at the applicable governed speed.

3.7.6.1.1 Diesel engine. The diesel engine shall start within 5 minutes and be ready for full load operation within 15 minutes. The commercial diesel engine supplied shall meet all the performance requirements specified herein using fuel conforming to VV-F-800, grade DF-2, or when specified (see 6.2), fuel conforming to MIL-T-5624, grade JP-5.

3.7.6.1.2 Gasoline engine. The gasoline engine shall be an air or liquid cooled, industrial type, of a commercial design that has been proven satisfactory in extensive use, and for which repair parts are readily obtainable.

3.7.6.1.3 Engine accessories. Both gasoline and diesel engines shall be complete with the accessories normally furnished with the engine, with the following as a minimum:

a. Electrical cranking system. Battery shall be not less than 12-volt (V) potential, lead acid, and negative ground. The voltage and ampere-hour rating of the batteries shall be manufacturer's standard.

b. A battery charging alternator, with a rating of not less than 32 amperes.
c. Manufacturer's standard fuel filtration system.
d. Intake air cleaner shall be of the dry type, replaceable element.
e. Hour meter.
f. Engine governor with hand control to set and control any speed from idle to maximum.
g. Lubricating oil pressure indicator.
h. Battery charge indicator.
i. Muffler.
j. Liquid quantity fuel indicator.
k. The fuel tank shall be of sufficient capacity for not less than 4 hours of normal operation.
l. The engine shall be provided with a weather-resistant housing of heavy-gage sheet steel. The housing shall be removable or otherwise designed to permit engine removal and replacement.
m. Coolant temperature indicator (if liquid cooled).

3.7.6.2 Electric motor. The electric motor shall be 230/460V, 3 phase, 60 Hertz, ball bearing, fully enclosed, fan cooled, integral hp, temperature rise 55o Centigrade (C), and designed for heavy-duty use. The motor shall conform to NEMA MG-1. The motor speed, hp, and torque characteristics shall be sufficient to operate the conveyor under any of the requirements and tests specified herein. Motor wiring and controls shall conform to applicable portions of NFPA 70. The motor shall be provided with a mounting bracket and shall be initially wired for 460V.

3.7.6.2.1 Motor controller. A motor controller conforming to NEMA ICS-2, and applicable portions of NFPA 70, shall be furnished. The motor controller shall be mounted in a protected location. Overload and undervoltage protection shall be provided. The controller shall be housed in a NEMA ICS-6 type No. 12 enclosure. The controller shall be equipped with dustproof and waterproof connector to accommodate a power cable from an outside source.

3.7.6.2.2 ON-OFF switch. The conveyor shall be furnished with an ON-OFF switch for manually starting and stopping the electric motor. The switch shall be mounted near the foot end of the conveyor and shall be accessible from the ground when the conveyor is elevated to all operating positions.

3.7.6.2.3 Power cable. A 75-foot long power cable shall be provided. The cable shall be four wire, of sufficient ampacity, type "SO" and conform to UL 62. The cable shall be terminated on one end with a three pole, four wire, locking type NEMA L16-30P plug, conforming to NEMA WD-6 and UL 498.

3.8 Mounting. The conveyor shall be mounted on a pneumatic-tired, two or four wheeled axle assembly, and joined to a common steel frame of welded construction. Wheels shall have ball or roller bearings protected from dust, sand, and water.

3.8.1 Wheels and tires. Wheel and tire ratings shall conform to TRA recommendations for the type and size of tires furnished. Tires shall be tube or tubeless type with highway tread. Tires shall be of rated capacity at least equal to the load imposed on each tire, measured at each wheel at the ground. Tires shall be not less than 100 level quality and shall be of domestic make.

When tube type tires are furnished, inner tubes shall be heavy-duty type, and shall be of the proper size for the tires furnished.

3.8.2 Towing speed. The conveyor shall be capable of being towed at an average speed of not less than 15 miles per hour (mph) over paved roads.

3.8.3 Tongue, lunette, and safety chains. The trailer tongue shall be equipped with a lunette having an eye of not less than 3-inch inside diameter and conforming to standard commercial practice. Two safety chains, conforming to DoT Motor Carrier Safety Regulations, section 393.70, shall be attached to the tongue. Each chain shall extend between 36 and 42 inches beyond the lunette eye and shall be equipped with a safety hook. The safety hook shall pass through a 2-inch diameter opening.

3.9 Equipment accessories. Unless otherwise specified in the contract (see 6.2), equipment shall be shipped with all required accessories, repair parts, and tools.

3.10 Lubrication. Unless otherwise specified (see 6.2), means for lubrication shall be in accordance with the manufacturer's standard practice. The lubricating points shall be easily visible and accessible. Hydraulic lubrication fittings shall be in accordance with SAE J534. Where use of high-pressure lubricating equipment, 1,000 pound-force per square inch (psi) or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location. The unit shall be lubricated prior to delivery with type of lubricant specified in the operator's manual and grade of lubricant recommended for ambient temperature at the delivery point. The unit shall be conspicuously tagged to identify the lubricants and their temperature range.

3.11 Identification plate. When specified in the contract (see 6.2), an identification plate will be furnished by the contracting officer for each conveyor. The contractor shall stamp all necessary data in the blank spaces of the plate provided for that purpose, and securely affix a plate to each conveyor in a conspicuous place with nonferrous screws, bolts, or rivets not less than 1/8-inch in diameter. The applicable nomenclature contained in the contract item description shall be placed in the top blank.

3.12 Instruction plates. The conveyor shall be equipped with instruction plates suitably located, describing any special or important procedures to be followed in operating and servicing the equipment. Plates shall be of a nonferrous material which will last and remain legible for the life of the equipment, and shall be securely affixed thereto with nonferrous screws, bolts, or rivets of not less than 1/8-inch diameter.

3.13 Cleaning, treatment, and painting. Unless otherwise specified in the contract (see 6.2), surfaces normally painted in good commercial practice shall be cleaned, treated, and painted as specified herein. The color of the finish coat shall be as specified (see 6.2). Surfaces to be painted shall be cleaned and dried to insure that they are free from contaminants such as oil, grease, welding slag and spatter, loose mill scale, water, dirt, corrosion product, or any other contaminating substances. As soon as practicable after cleaning, and before any corrosion product or other contamination can result, the surfaces shall be prepared or treated to insure the adhesion of the coating system. The

painting shall consist of at least one coat of primer and one finish coat of acrylic-based enamel. The primer shall be applied to a clean, dry surface as soon as practicable after cleaning and treating. Painting shall be with manufacturer's current materials according to manufacturer's current processes and the total dry film thickness shall be not less than 2.5 mils over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects.

3.14 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to insure interchangeability of component parts, assemblies, accessories, and spare parts.

3.15 Workmanship.

3.15.1 Component fabrication. The steel used in fabrication shall be free from kinks, sharp bends, and other conditions which would be deleterious to the finished product. Manufacturing processes shall not reduce the strength of the steel to a value less than intended by the design. All bends shall be made by controlled means to insure uniformity of size and shape. The completed lattice framework shall not deviate from straightness, without load, in excess of 0.25 inch multiplied by length in feet divided by 10 (0.25 inch X L(ft)/10).

3.15.2 Bolted connections. Boltholes shall be accurately punched or drilled and shall have the burrs removed. Washers or lockwashers shall be provided and all bolts, nuts, and screws shall be tight.

3.15.3 Riveted connections. Rivet holes shall be accurately punched or drilled and shall have the burrs removed. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads, when not countersunk or flattened, shall be of approved shape and of uniform size for the same diameter of rivet. Rivet heads shall be full, neatly made, concentric with the rivet holes, and in full contact with the surface of the member.

3.15.4 Welding. Welding procedures shall be in accordance with AWS D14.3. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings. The welder shall be qualified per AWS D14.3.

3.15.5 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or any other defect which reduces the casting's ability to perform its intended function.

3.15.6 Lifting and tiedown attachments. The conveyor shall be equipped with lifting and tiedown attachments. Lifting and tiedown attachments shall conform to type II or type III of MIL-STD-209. A nonferrous transportation plate shall be provided and mechanically attached to the conveyor. Transportation plates shall be inscribed with a diagram showing the lifting attachments and lifting slings, the capacity of each attachment, and the required length and size of each sling cable. A silhouette of the item furnished showing the center of gravity shall be provided on the transportation plate. Tiedown attachments may

be identified by stenciling or other suitable marking. Tiedown marking shall clearly indicate that the attachments are intended for the tiedown of the conveyor on the carrier when shipped.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2.1).
b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on one conveyor when a first article is required (see 3.2 and 6.5). This inspection shall include the examination of 4.3 and the tests of 4.4.2. The first article may be either a first production item or a standard production item from the supplier’s current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract. When a first article test is specified in the contract and the contractor desires to deliver a test unit as a contract item, it shall be delivered as the last item on the contract only after the contractor, at his own cost and expense, shall have completely cleaned, reconditioned and overhauled the unit (restored to like-new), making such replacement and modifications thereto as are required to make the unit acceptable as a contract item.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.3, the tests of 4.4.1, and the packaging inspection of 4.5.

4.3 Examination. Each conveyor shall be examined for compliance with the requirements specified in section 3 of this specification. Any redesign or modification of the contractor’s standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection. Any modifications or design changes after the

first article test shall require the manufacturer to furnish proof of acceptability to the procuring activity for approval prior to further delivery.

4.4 Tests. The first article shall receive the tests of 4.4.2. Each production unit shall receive the tests of 4.4.1. Failure to pass any test shall constitute cause for rejection.

4.4.1 Production unit tests. Each production conveyor shall be serviced and fueled or connected to an appropriate power supply in accordance with the manufacturer's recommendations prior to testing. Each conveyor shall be started and operated for a sufficient time to determine that all controls operate properly. Leaks, malfunction of the hydraulic system, or any controls which cannot be corrected by minor adjustment shall constitute failure of this test.

4.4.2 First article tests. The following tests shall be performed when a first article sample is required (see 3.2).

4.4.2.1 Road. With the conveyor in its mobile configuration, tow the conveyor for not less than 20 miles over paved roads at an average speed of not less than 15 mph. Cracked joints, weldments, or permanent deformation to any part of the conveyor shall constitute failure of this test.

4.4.2.2 Performance. The conveyor shall be operated at four elevated settings from 12o to 21o, delivering the designated loads of 100 pounds per cubic foot of 0.75 inch minus river run gravel or 2 inch minus of crusher run aggregate for the type specified (see 1.2). The conveyor shall be operated for a sufficient period of time in order to determine compliance with 3.6. The test shall be performed without repair or replacement of any parts. Inability to accomplish any requirement to the extent specified shall constitute failure of this test.

4.4.2.3 Deflection check. To determine compliance with 3.7 and 3.15.1:

a. Park the conveyor unit on a flat, level, hard surface, and elevate the conveyor to 12o with the installed hydraulic system.
b. With the conveyor resting with no load, to establish a reference to determine straightness of the main frame (deflection) in the loaded condition, strike a chalk line mark the total length on the outside surface on the underside and side of the lower main frame members (cords). Determine if the straightness (deflection) of 3.15.1 is exceeded.
c. Load the belt to the maximum required to convey the required ton per hour for the type specified with material specified in 4.4.2.2.
d. With the belt loaded, stretch a line next to the chalk line marks made previously and measure the difference between the chalk line mark and the stretched line, and record. Make this measurement on both sides, on both the outside and the underside to determine compliance with 3.7.
e. If the difference in deflection (D) between the no load and the loaded condition in any 10 foot span or between any two supports exceeds 1/360-inch (D (in inches) = l/360, l = length in inches), the conveyor frame fails the test.

4.5 Preparation for delivery inspection. The preservation, packaging, packing, and marking of the item shall be inspected to verify conformance to the requirements of section 5.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or commercial as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Methods of preservation. Cleaning processes, drying procedures, preservatives, and methods of preservation shall be as specified in the following paragraphs, in the requirements of MIL-P-116, and in any applicable specifications.

5.1.1.2 Disassembly. Disassembly shall be the minimum necessary to protect parts subject to damage or loss, and to accomplish reduction in cube. Removed bolts, nuts, pins, screws and washers shall be reinstalled in mating parts and secured to prevent their loss.

5.1.1.3 Matchmarking. Parts removed and mating parts on the equipment and attachments shall be matchmarked to facilitate reassembly. Parts and accessories removed, and mating parts on the equipment, shall be identified with weatherproof tags attached to mating parts and locations. Markings shall be applied to the tags with a waterproof material.

5.1.1.4 Cleaning and drying. Prior to the application of preservative compounds or paint, surfaces shall be cleaned by process C-1 and dried by any applicable procedure of MIL-P-116.

5.1.1.5 Unprotected surfaces. Unprotected exterior metal surfaces requiring the application of a contact preservative in accordance with MIL-P-116, and not specifically provided for herein, shall be preserved as follows:

5.1.1.5.1 Unfinished (not machined) surfaces. Unfinished exterior metal surfaces shall be coated with type P-1 preservative.

5.1.1.5.2 Machined surfaces. Exposed machined surfaces shall be coated with type P-6 or P-11 preservative and wrapped or covered, as applicable, with barrier material conforming to MIL-B-121, type I, grade A, class 2. The material shall be secured in place with waterproof tape.

5.1.1.6 Engines. Engines, engine components, and accessories shall be preserved in accordance with the level A requirements of MIL-E-10062, type II, method IIa. The engine shall be removed and packaged in a box as specified in 5.1.1.19.

5.1.1.7 Electrical motors. Preserve level A by the alternate method of MIL-E-16298.

5.1.1.8 Hydraulic systems. The hydraulic fluid supply tanks shall be filled to the operating level with hydraulic fluid required for operation. The pistons shall be retracted as far as practicable into the cylinders and secured. When

the pistons cannot be fully retracted, the exposed portions of the piston rods (ramshafts) shall be coated with type P-6 or P-11 preservative and the coated surfaces wrapped or covered with barrier-material conforming to MIL-B-121, type I, grade A, class 2, extending the wraps approximately 2 inches onto the ram cylinders. The wraps shall be secured in place with waterproof tape. When the pistons can be fully retracted, any remaining uncoated surfaces of the piston rods shall be coated with type P-1 preservative, with no wrapping required. The hydraulic control valves shall be secured in the neutral position and preserved as specified herein for piston rods. Hoses shall not be disconnected. A weatherproof tag shall be attached to the control lever indicating: "The hydraulic supply tank is filled to the operating level with fluid required for operation. Do not drain." Markings shall be applied to the tag with a waterproof material.

5.1.1.9 Gears.

5.1.1.9.1 Exposed gears. All unpainted surfaces of exposed gears shall be coated with type P-1 preservative or with primer conforming to TT-P-664.

5.1.1.9.2 Enclosed gears. Enclosed gears shall be filled to the operating level with the approved lubricant required for operation. The gear housing shall be identified with a weatherproof tag to indicate: "The housing is filled to the operating level with lubricant required for operation. Do not drain until first required lubrication change." Markings shall be applied to the tag with a waterproof material. The tags shall be attached in a conspicuous location.

5.1.1.10 Drive chains.

5.1.1.10.1 Exposed drive chains. Exposed drive chains shall be coated with enough type P-9 preservative to insure penetration of the preservative to the inner surface of the rollers, pins, and bushings. After the excess preservative has drained, the entire chain and the unpainted surfaces of the sprocket shall be coated with type P-3 preservative.

5.1.1.10.2 Enclosed chains. Enclosed chains and chain housings shall be preserved and tagged as specified in 5.1.1.9.2 for enclosed gears.

5.1.1.11 Drive belts and pulleys. Drive belts shall be removed or released from tension. Removed belts shall be preserved method IC-I or IC-3. Unpainted surfaces shall be coated with primer conforming to TT-P-664. A weatherproof tag shall be attached in a conspicuous location indicating: "Belts have been (removed or released from tension). (Install or tension) prior to operation." Markings shall be applied to the tags with a waterproof material.

5.1.1.12 Conveyor belts. Metal facings shall be coated with varnish conforming to TT-V-119 or MIL-V-13811. Each belt shall be completely rolled with a tube or piece of round wood placed in each end fold of the belt to prevent sharp bends. Prior to rolling, belt surfaces shall be dusted with powdered talc to prevent surfaces from adhering together. When required to hold belt in compact roll, strapping conforming to ASTM D3953, type 1 or 2, grade 1 or 2, shall be placed around the roll. Suitable protective cushioning shall be placed under the strapping, and the strapping not tensioned so tight as to damage the belting. Each rolled belt shall be wrapped with waterproofed barrier

conforming to PPP-B-1055, class E-1 or E-2, with all laps, seams, and folds sealed with adhesive conforming to MMM-A-260.

5.1.1.13 Wheels, axles, bearings, and tires. When wheels are removed, the tires shall be inflated to two-thirds of the specified operating pressure. The wheel nuts shall be replaced on the studs and the exposed threaded surfaces shall be coated with type P-1 preservative. When wheels and hubs are removed from axles or spindles, the interior bearing surfaces of the hubs and the bearings or bearing surfaces of the axles or spindles shall be coated with type P-11 preservative. The coated surfaces of the axles or spindles shall be wrapped and hub openings shall be covered with barrier material conforming to MIL-B-121, type I, grade A, class 2. The barrier material shall be secured in place with tape conforming to PPP-T-60, type IV. Bearings removed from the wheels shall be coated with type P-11 preservative and preserved method IA-8. When wheels are not removed, the tires shall be inflated to 10 pounds above the specified operating pressure and wheel bearings shall be preserved with type P-11 preservative.

5.1.1.14 Power cable. Power cable shall be coiled compactly and of a diameter to prevent damage to the cable. The coil shall be secured in at least three places spaced equidistantly.

5.1.1.15 Trailer. The trailer shall be preserved as specified in MIL-V-62038 for level A (mobile) requirements.

5.1.1.16 Maintenance tools. Maintenance tools shall be preserved in accordance with level A preservation and packaging requirements of PPP-P-40.

5.1.1.17 Technical publications. Technical publications for each piece of equipment shall be preserved method IC-1 or IC-3.

5.1.1.18 Repair parts. The preservative application criteria and applicable methods of preservation of MIL-P-116 shall be used to preserve repair parts. When specified (see 6.2), the repair parts shall be preserved in accordance with level A requirements of MIL-S-196, or when parts are not specifically covered in MIL-S-196, an applicable submethod of preservation of MIL-P-116 shall be used.

5.1.1.19 Consolidation. When furnished, the tool boxes shall be utilized for the consolidation of loose components, tools, and publications. Tool boxes shall be secured to prevent pilferage. The remainder of the components that will not fit in the tool boxes shall be consolidated, along with disassembled components, in boxes conforming to PPP-B-601, overseas type, or PPP-B-621, class 2. The contents shall be cushioned, blocked, and braced to prevent movement in accordance with MIL-STD-1186. Boxes shall be secured to the equipment with appropriate strapping. Arrangement and location on the equipment shall be such so as not to increase cubage or interfere with lifting or mobility of the equipment.

5.1.2 Commercial. Commercial packaging shall be in accordance with ASTM D3951.

5.2 Packing. Packing shall be level A, or commercial as specified (see 6.2).

5.2.1 Level A. The conveyor shall be shipped knocked down to the most practicable extent. The structural components shall be nested, arranged, and secured with bolts or steel strapping, in combination with suitable wood blocking or battens, as required to form nonshifting bundles. The strapping shall be 0.035 by 1-1/4 inch strapping conforming to ASTM D3953 type 1 or 2, grade 1 or 2. The strapping shall be stapled to any wood blocking or battens provided. Where it is not practicable to disassemble the equipment to the extent required for suitable bundling, the sections shall be secured to skid bases conforming to the skid type base of MIL-C-104, style A crates, and shipped as individual assemblies. Where skid bases are used, consideration shall be given to consolidating and securing any bundled or boxed components on the skid bases.

5.2.2 Commercial. The equipment shall be prepared for shipment in a manner which will insure arrival at destination in a satisfactory condition. Preparation for delivery shall comply with applicable carrier rules and regulations.

5.3 Marking.

5.3.1 Military agencies. Shipments to military agencies shall be marked in accordance with MIL-STD-129.

5.3.2 Civil agencies. Shipments to civil agencies shall be marked in accordance with FED-STD-123.

6. NOTES

6.1 Intended use. The conveyor is intended for use in handling sand, gravel, crushed rock, coal, and similar loose bulk material.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in acquisition documents:

a. Title, number and date of this specification
b. The specific issue of the DODISS or the date of the individual documents to be cited in the solicitation (see 2.1.1)
c. Class, type, and size required (see 1.2)
d. When a first article is required for inspection and approval (see 3.2)
e. Method of power transmission and type of power required (3.7.6)
f. When diesel engine is required to operate on JP-5 fuel (see 3.7.6.1.1)
g. When accessories are not to be shipped with the equipment (see 3.9)
h. When lubrication is other than specified (see 3.10)
i. When an identification plate is to be provided by the contracting officer (see 3.11)
j. When cleaning, treatment, and painting is different, and color of finish coat required (see 3.13)
k. Level of preservation and level of packing required (see 5.1 and 5.2)
l. When repair parts shall be preserved in accordance with level A, MIL-S-196 (see 5.1.1.18)

6.2.1 Part or Identification Number (PIN). A PIN has been established for use to identify the classified item for acquisition (see 1.2). The PIN consists of the document identifier (OOC2804) and a PIN code number (see 1.2) for the different options for acquisition.

Example:

```
OOC2804-1-A-1
   *    * * *-------Size 1 - 40 feet long
   *    * *
   *    * *---------Type A - 100 tph minimum (18-inch belt)
   *    *
   *    *-----------Class I - Diesel engine driven
   *
   *----------------Document identifier
```

6.3 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL, DD Form 1423), incorporated into the contract. When the provisions of DOD FAR Supplement, Part 27, Sub-Part 27.410-6 are invoked and the DD Form 1423 is not used, the data shall be delivered by the contractor in accordance with the contract or purchase order requirements.

6.4 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, military specifications and standards that have been cleared and listed in DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL) must be listed on a separate Contract Data Requirements List (DD Form 1423), which must be acquired under separate contract line item in the contract.

6.5 First article. When a first article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.6 Subject term (keyword) listing.

Hopper
Troughing

6.7 Qualified Products Listing (QPL). QPL's are available covering materials conforming to MIL-V-13811 and TT-P-664 (QPL-13881-12 and QPL-TT-P-664-19).

6.8 Supersession data. This specification replaces military specification MIL-C-28662C(YD), dated 21 December 1987.

6.9 Classification cross reference. Classifications used in this specification (see 1.2) are different from those found in the superseded military specification, MIL-C-28662C, as follows:

MIL-C-28662C	OO-C-2804
Class I	Class I
Class II	Class II
Class III	Class III
Type I	Type A
Type II	Type B
Type III	Type C
Size 1	Size 1
Size 2	Size 2
Size 3	Size 3
Size 4	Size 4

MILITARY INTERESTS:

Custodians

Army - ME
Navy - YD

Review Activity

DLA - CS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD

(Project 3910-0195)

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein.