



CERTIFICATE NUMBER 21-2134226-PDA

EFFECTIVE DATE 27-Jul-2021

EXPIRATION DATE 26-Jul-2026

ABS TECHNICAL OFFICE Singapore Ship Engineering

CERTIFICATE OF

Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

USHA MARTIN LIMITED

located at

**(WIRE ROPES & SPECIALITY PRODUCTS DIVISION), WORKS,
TATISILWAI, RANCHI, JHARKHAND, INDIA, 835103**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Wire Rope

Model Nominal Rope Dia. 1/4" to 6" (3mm to 152mm)

This Product Design Assessment (PDA) Certificate remains valid until 26/Jul/2026 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau of Shipping

Ramendra Kumar Pandey

Ramendra Kumar Pandey, Principal Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

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Tier: 2 - PDA Issued**Product:** Wire Rope
Model: Nominal Rope Dia. 1/4" to 6" (3mm to 152mm)**Endorsements:****Intended Service:**

General purpose wire ropes.

Description:

Stranded Steel Wire Rope. Refer to the attachment for details.

Rating:

- (1) 6x7-FC (Dia. 6.0 - 40.0 mm, Grade 1770 N/mm², 1960 N/mm²), (Dia. ¼ - 1.1/2 inch, Grade IPS, EIP): Minimum Breaking Force refers to Table C.1 of API Spec 9A;
- (2) 6x7-WSC/IWRC (Dia. 6.0 - 40.0 mm, Grade 1770 N/mm², 1960 N/mm²), (Dia. ¼ - 1.1/2 inch, Grade IPS, EIP): Minimum Breaking Force refers to Table C.2 of API Spec 9A;
- (3) 6x19M-FC (Dia. 3.0 - 32.0 mm, Grade 1770 N/mm², 1960 N/mm²): Minimum Breaking Force refers to Table C.3 of API Spec 9A;
- (4) 6x19M-WSC/IWRC (Dia. 8.0 - 32.0 mm, Grade 1770 N/mm², 1960 N/mm²): Minimum Breaking Force refers to Table C.4 of API Spec 9A;
- (5) 6x37M-FC (Dia. 5.0 - 40.0 mm, Grade 1770 N/mm², 1960 N/mm²): Minimum Breaking Force refers to Table C.5 of API Spec 9A;
- (6) 6x37M-WSC/IWRC (Dia. 8.0 - 40.0 mm, Grade 1770 N/mm², 1960 N/mm²): Minimum Breaking Force refers to Table C.6 of API Spec 9A;
- (7) 6x19S-FC, 6x21F-FC, 6x26WS-FC, 6x19W-FC & 6x25F-FC (Dia. 6.0 - 60.0 mm, Grade 1770 N/mm², 1960 N/mm², 2160 N/mm²), (Dia. ¼ - 2.1/4 inch, Grade IPS, EIP, EEIP): Minimum Breaking Force refers to Table C.7 of API Spec 9A;
- (8) 6x19S-IWRC, 6x21F-IWRC, 6x26WS-IWRC, 6x19W-IWRC & 6x25F-IWRC (Dia. 6.0 - 60.0 mm, Grade 1770 N/mm², 1960 N/mm², 2160 N/mm²), (Dia. ¼ - 2.1/4 inch, Grade IPS, EIP, EEIP): Minimum Breaking Force refers to Table C.8 of API Spec 9A;
- (9) 6x31WS-FC, 6x36WS-FC, 6x41WS-FC, 6x41SF-FC, 6x49SWS-FC & 6x46WS-FC (Dia. 6.35 - 60.0 mm, Grade 1770 N/mm², 1960 N/mm², 2160 N/mm²), (Dia. ¼ - 2.1/4 inch, Grade IPS, EIP, EEIP): Minimum Breaking Force refers to Table C.9 of API Spec 9A;
- (10) 6x31WS-IWRC, 6x36WS-IWRC, 6x41WS-IWRC, 6x41SF-IWRC, 6x49SWS-IWRC & 6x46WS-IWRC (Dia. 6.35 - 60.0 mm, Grade 1770 N/mm², 1960 N/mm², 2160 N/mm²), (Dia. ¼ - 2.1/4 inch, Grade IPS, EIP, EEIP): Minimum Breaking Force refers to Table C.10 of API Spec 9A;
- (11) 8x19S-IWRC, 8x21F-IWRC, 8x26WS-IWRC, 8x19W-IWRC & 8x25F-IWRC (Dia. 6.35 - 60.0 mm, Grade 1770 N/mm², 1960 N/mm², 2160 N/mm²), (Dia. ¼ - 2.1/4 inch, Grade IPS, EIP, EEIP): Minimum Breaking Force refers to Table C.11 of API Spec 9A;
- (12) 8x31WS-IWRC, 8x36WS-IWRC & 8x41WS-IWRC (Dia. 8.0 - 60.0 mm, Grade 1770 N/mm², 1960 N/mm², 2160 N/mm²), (Dia. 3/8 - 2.1/4 inch, Grade IPS, EIP, EEIP): Minimum Breaking Force refers to Table C.12 of API Spec 9A;
- (13) 17x7-FC, 17x7-WSC, 18x7-FC, 18x7-WSC (Dia. 6.0 - 38.1 mm, Grade 1770 N/mm², 1960 N/mm²), (Dia. ¼ - 1.1/2 inch, Grade IPS, EIP): Minimum Breaking Force refers to Table C.13 of API Spec 9A;
- (14) 34(M)x7-FC, 34(M)x7-WSC, 36(M)x7-FC, 36(M)x7-WSC (Dia. 10.0 - 44.0 mm, Grade 1770 N/mm², 1960 N/mm²), (Dia. 7/16 - 1.5/8 inch, Grade IPS, EIP): Minimum Breaking Force refers to Table C.14 of API Spec 9A;
- (15) 35(W)x7-WSC & 40(W)x7-WSC (Dia. 8.0 - 40.0 mm, Grade 1770 N/mm², 1960 N/mm², 2160 N/mm²): Minimum Breaking Force refers to Table C.15 of API Spec 9A;
- (16) 6xV25-IWRC, 6xV25B-IWRC, 6xV28B-IWRC (Dia. 12.7 mm (1/2") - 60.3 mm (2.3/8"), Grade IPS, EIP): Minimum Breaking Force refers to Table C.16 of API Spec 9A;
- (17) 6x36WS-IWRC, 6x41WS-IWRC, 6x46WS-IWRC, 6x47WS-IWRC, 6x49WS-IWRC, 6x52WS-IWRC, 6x61WS-IWRC, 8x36WS-IWRC, 8x41WS-IWRC, 8x46WS-IWRC, 8x49WS-IWRC, 8x52WS-IWRC & 8x61WS-IWRC (Dia.

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Tier: 2 - PDA Issued

63.5 mm (2.1/2") - 152 mm (6")): Grade 1770 N/mm², 1960 N/mm², 2160 N/mm², IPS, EIP, EEIP) - Minimum Breaking Force refers to Annex E/Tables E.1 - E.3 (as applicable) of API Spec 9A; USHA MARTIN LIMITED's Customized Grades TITAN (Grade 1570 - 1960 N/mm²), SUPER TITAN (Grade 1770 - 2160 N/mm²), TITAN MAX (Grade 1960 - 2160 N/mm²) - Minimum Breaking Force refers to Annex F of API Spec 9A.

Service Restriction:

(1) Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

(2) If the type approved wire ropes are intended for use as towline wire or rope, and hawsers on ABS Classed Vessels, the breaking strength of the rope is to be in accordance with 3-5-1 of ABS Rules for Building & Classing Marine Vessels 2021/Steel Vessels for Service on Rivers and Intracoastal Waterways 2021/High Speed Crafts 2021 or 3-3-1 of ABS Rules for Building & Classing Steel Barges 2021/Bulk Carriers for Service on the Great Lakes 2021 (as applicable), which is not covered under this PDA.

(3) If the wire ropes are intended for use on ABS certified lifting appliances, they must also comply with the ABS Guide for Certification of Lifting Appliances, December 2020. ABS Form "Certificate for Examination and Test of Wire Rope Before Being Taken into Use" must NOT be endorsed by ABS unless the Surveyor confirms the requirements of ABS Guide for Certification of Lifting Appliances, December 2020 are complied with and also witnesses the breaking tests. If USHA MARTIN LIMITED as the manufacturer chooses to endorse this form, the type approval audit would include confirmation that all requirements of ABS Guide for Certification of Lifting Appliances, December 2020 and API Specification 9A, Twenty-Seventh Edition, August 2020 are being followed.

(4) In those instances where flag Administration may have their own specific requirements e.g. USCG, specific flag Administration's approval may be required.

Comments:

(1) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

(2) For those ropes covered in Annex C of API Spec 9A, the minimum breaking force of intermediate wire rope diameters shall be calculated with the respective minimum breaking force factors in accordance with Annex F of API Spec 9A (Refer 4.5.3.1 of API Spec 9A) and the same is subject to inspection and survey by the attending surveyor.

Notes/Drawing/Documentation:

(1) Survey Reports by ABS Surveyor (Report Number CC3416924 dated 28 Nov 2017, CC3376842 dated 31 Aug 2017, CC3538072 dated 11 Aug 2018 & CC3510077 dated 16 Jun 2018).

(2) Test Report of Wire Ropes (Ref. R0310921, dated 23-Sep-2020).

(3) Test Report of Wire Ropes (Ref. R0310925, dated 23-Sep-2020).

(4) Test Report of Wire Rope (Ref. B408710001, dated 24-Apr-2021).

(5) Following listed documents:

Drawing No. 1, Class 6x7 Fiber Core, Revision: 0, Pages: 1

Drawing No. 10, Class 6x36 Steel Core, Revision: 0, Pages: 1

Drawing No. 11, Class 8x19 Steel Core, Revision: 0, Pages: 1

Drawing No. 12, Class 8x36 Steel Core, Revision: 0, Pages: 1

Drawing No. 13, Class 18x7, Revision: 0, Pages: 1

Drawing No. 14, Class 34(M)x7, Revision: 0, Pages: 1

Drawing No. 15, Class 35(W)x7, Revision: 0, Pages: 1

Drawing No. 16, Class 6xV25TS Steel Core, Revision: 0, Pages: 1

Drawing No. 17, Class Large Dia 6 & 8 stranded wire rope, Revision: 0, Pages: 1

Drawing No. 18, Sample Declaration of Conformity for Renewal or Re-Validation, Revision: 0, Pages: 1

Drawing No. 19, TEST RESULT-2.3-4, 6x47, EIPS, IWRC, Revision: 0, Pages: 1

Drawing No. 2, Class 6x7 Steel Core, Revision: 0, Pages: 1

Drawing No. 20, TEST RESULT-23mm, 40X7, 1770, Revision: 0, Pages: 1

Drawing No. 21, TEST RESULT-25mm, 35X7, 1960, Revision: 0, Pages: 1

Drawing No. 22, TEST RESULT-30mm, 6x19, 1770, IWRC, Revision: 0, Pages: 1

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Drawing No. 23, TEST RESULT-32mm, 6x19, 1770, Revision: 0, Pages: 1
Drawing No. 24, TEST RESULT-38mm, 6x37, 1960, Revision: 0, Pages: 1
Drawing No. 25, TEST RESULT-40mm, 35X7, 1960, Revision: 0, Pages: 1
Drawing No. 26, TEST RESULT-51mm, 6x41, 1770, IWRC, Revision: 0, Pages: 1
Drawing No. 27, TEST RESULT-57.15mm, 6x36SW, 2160, IWRC, Revision: 0, Pages: 1
Drawing No. 28, TEST RESULT-70mm, 6x41WS, EEIP, IWRC, Revision: 0, Pages: 1
Drawing No. 29, TEST RESULT-70mm, 8x36SW, 2160, IWRC, Revision: 0, Pages: 1
Drawing No. 3, Class 6x19M Fiber Core, Revision: 0, Pages: 1
Drawing No. 30, TEST RESULT-76.2mm, 6x36WS, 1960, IWRC, Revision: 0, Pages: 1
Drawing No. 31, TEST RESULT-76mm, 8x36, EEIP, IWRC, Revision: 0, Pages: 1
Drawing No. 32, TEST RESULT-76mm, 8x41, 1960, IWRC, Revision: 0, Pages: 1
Drawing No. 33, TEST RESULT-80mm, 6x49SW, TITAN MAX, IWRC, Revision: 0, Pages: 1
Drawing No. 34, TEST RESULT-83mm, 6x49, TITAN MAX, IWRC, Revision: 0, Pages: 1
Drawing No. 35, TEST RESULT-101mm, 6x52SW, TITAN MAX, IWRC, Revision: 0, Pages: 1
Drawing No. 36, TEST RESULT-114mm, 6x52SW, EEIP, IWRC, Revision: 0, Pages: 1
Drawing No. 37, TEST RESULT-115mm, 6x61SW, 1960, IWRC, Revision: 0, Pages: 1
Drawing No. 38, TEST RESULT-140mm, 8x61SW, SUPER TITAN, IWRC, Revision: 0, Pages: 1
Drawing No. 39, SURVEY REPORT OF 6X26WS, 6X36 & 6X29F, Revision: 0, Pages: 1
Drawing No. 4, Class 6x19M Steel Core, Revision: 0, Pages: 1
Drawing No. 40, SURVEY REPORT OF 6X36WS & 6X19S, Revision: 0, Pages: 1
Drawing No. 41, SURVEY REPORT OF 6X36WS, 6X26WS & 6X41WS, Revision: 0, Pages: 1
Drawing No. 42, SURVEY REPORT OF 6X36WS, 6X49 & 6X26WS, Revision: 0, Pages: 1
Drawing No. 43, SURVEY REPORT OF 35X7, 6X36, 6X26WS, 6X19S & 6X36WS, Revision: 0, Pages: 1
Drawing No. 44, ABS -Product details List-API Spec 9A 2020, Revision: 0, Pages: 1
Drawing No. 5, Class 6x37M Fibre Core, Revision: 0, Pages: 1
Drawing No. 6, Class 6x37M Steel Core, Revision: 0, Pages: 1
Drawing No. 7, Class 6x19 Fibre Core, Revision: 0, Pages: 1
Drawing No. 8, Class 6x19 Steel Core, Revision: 0, Pages: 1
Drawing No. 9, Class 6x36 Fiber Core, Revision: 0, Pages: 1
Drawing No. ISO , ISO 9001:2015 Certificate, Revision: 0, Pages: 1
Document "UML Rope Grade Nomenclature for Large Diameter Stranded Wire Rope, Doc. No. UM-L3-R&D-002, Rev. 00".
Document "Manufacture & Supply of Wire Ropes with Intermediate Diameters, Doc. No. UM-L3-R&D-003, Rev. 00".

Terms of Validity:

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STANDARDS

USHA MARTIN LIMITED

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ABS Rules:

- (1) ABS Rules For Building And Classing Marine Vessels Rules (2021): 1-1-4/7.7, 1-1-A3, 1-1-A4;
- (2) ABS Rules For Building And Classing Steel Vessels for Service on Rivers and Intracoastal Waterways (2021): 1-1-4/7.7, 1-1-A3, 1-1-A4;
- (3) ABS Rules For Building And Classing Bulk Carriers for Service on the Great Lakes (2021): 1-1-4/7.7, 1-1-A3, 1-1-A4;
- (4) ABS Rules For Building And Classing Steel Barges (2021): 1-1-4/7.7, 1-1-A3, 1-1-A4;
- (5) ABS Rules For Building And Classing High Speed Crafts (2021): 1-1-4/11.9, 1-1-A2, 1-1-A3;
- (6) ABS Rules For Building And Classing Mobile Offshore Units (2021): 1-1-4/9.7, 1-1-A2, 1-1-A3;
- (7) ABS Rules For Building And Classing Facilities on Offshore Installations (2021): 1-1-4/9.7, 1-1-A2, 1-1-A3.

National:

NA

International:

- (1) API Specification 9A, Twenty-Seventh Edition, August 2020.
- (2) ISO 10425:2003.

Government:

NA

EUMED:

NA

OTHERS:

NA

APPLICABLE STANDARD		API-9A/2020 & ISO 10425: 2003		MODEL: Nominal Rope Dia. 1/4" to 6" (3mm to 152mm)						
Classification (Compacted & Non Compacted Rope)	Construction (**)	Core (***)	Applied for							
			Diameter Range		Grade					
			(min.)	(max.)	1	2	3	4	5	6
Class 6x7 Fibre Core	6x7	FC	6.00 1/4"	40.00 1.1/2"	1770 IPS	1960 EIP				
Class 6x7 Steel Core	6x7	WSC / IWRC	6.00 1/4"	40.00 1.1/2"	1770 IPS	1960 EIP				
Class 6x19M Fibre Core	6x19M	FC	3.00 3/8"	32.00 1.1/4"	1770 1770	1960 1960				
Class 6x19M Steel Core	6x19M	WSC / IWRC	8.00 3/8"	32.00 1.1/4"	1770 1770	1960 1960				
Class 6x37M Fibre Core	6x37M	FC	5.00 3/8"	40.00 1.1/2"	1770 1770	1960 1960				
Class 6x37M Steel Core	6x37M	WSC / IWRC	8.00 3/8"	40.00 1.1/2"	1770 1770	1960 1960				
Class 6x19 Fibre Core	6x19S	FC	6.00 1/4"	60.00 2.1/4"	1770 IPS	1960 EIP	2160 EEIP			
	6x21F									
	6x26WS									
	6x19W									
	6x25F									
Class 6x19 Steel Core	6x19S	IWRC	6.00 1/4"	60.00 2.1/4"	1770 IPS	1960 EIP	2160 EEIP			
	6x21F									
	6x26WS									
	6x19W									
	6x25F									
Class 6x36 Fibre Core	6x31WS	FC	6.35 1/4"	60.00 2.1/4"	1770 IPS	1960 EIP	2160 EEIP			
	6x36WS									
	6x41WS									
	6x41SF									
	6x49SWS									
	6x46WS									
Class 6x36 steel Core	6x31WS	IWRC	6.35 1/4"	60.00 2.1/4"	1770 IPS	1960 EIP	2160 EEIP			
	6x36WS									
	6x41WS									
	6x41SF									
	6x49SWS									
	6x46WS									
Class 8x19 steel Core	8x19S	IWRC	6.35 1/4"	60.00 2.1/4"	1770 IPS	1960 EIP	2160 EEIP			
	8x21F									
	8x26WS									
	8x19W									
	8x25F									
Class 8x36 steel Core	8x31WS	IWRC	8.00 3/8"	60.00 2.1/4"	1770 IPS	1960 EIP	2160 EEIP			
	8x36WS									
	8x41WS									
Class 18x7	17x7	FC	6.00 1/4"	38.10 1.1/2"	1770 IPS	1960 EIP				
	18x7									
	17x7	WSC	6.00 1/4"	38.10 1.1/2"	1770 IPS	1960 EIP				
	18x7									
Class 34(M)x7	34(M)x7	FC	10.00 7/16"	44.00 1.5/8"	1770 IPS	1960 EIP				
	36(M)x7									
	34(M)x7	WSC	10.00 7/16"	44.00 1.5/8"	1770 IPS	1960 EIP				
	36(M)x7									

APPLICABLE STANDARD		API-9A/2020 & ISO 10425: 2003		MODEL: Nominal Rope Dia. 1/4" to 6" (3mm to 152mm)						
Classification (Compacted & Non Compacted Rope)	Construction (**)	Core (***)	Applied for							
			Diameter Range		Grade					
			(min.)	(max.)	1	2	3	4	5	6
Class 35(W)x7	35(W)x7	WSC	8.00	40.00	1770	1960	2160			
			3/8"	1.5/8"	1770	1960	2160			
	40(W)x7		8.00	40.00	1770	1960	2160			
			3/8"	1.5/8"	1770	1960	2160			
Class 6xV25TS steel Core	6x V25	IWRC	12.00	60.00	IPS	EIP				
	6x V25B		1/2"	2.3/8"	IPS	EIP				
	6x V28B									
Large Diameter Wire Ropes	6x36WS	IWRC								
	6x41WS									
	6x49WS									
	6x46WS		60.50	152.00	1770	1960	2160			
	6x47WS		60.50	152.00	IPS	EIP	EEIP	*TITAN	*SUPER TITAN	*TITAN MAX
	6x52WS									
	6x61WS		2.1/2"	6.00"	1770	1960	2160			
	8x36WS		2.1/2"	6.00"	IPS	EIP	EEIP	*TITAN	*SUPER TITAN	*TITAN MAX
	8x41WS									
	8x49WS									
	8x46WS									
	8x52WS									
	8x61WS									

* - Customised Grade
** - Construction as per clause 4.2.4 of API 9A spec, 27th edition Aug 2020.
*** - Cores as per clause 4.1.2 of API 9A spec, 27th edition Aug 2020 & ISO 17893