ASME B29.27-2002

SINGLE-PITCH AND DOUBLE-PITCH HOLLOW PIN CONVEYOR CHAINS AND ATTACHMENTS

AN AMERICAN NATIONAL STANDARD



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FOREWORD

For many years roller chain manufacturers furnished substantial volumes of a limited series of hollow pin chains for specific conveying applications. Such chains usually are rollerless bushing chains having cylindrical pins. The pin bores are essentially the same as the bushing bores for equivalent pitch chains in ASME B29.1 or ASME B29.4. The bushing, or roller, diameters and width are such that the single-pitch chains operate on ASME B29.1 sprockets and the double-pitch chains operate on ASME B29.4 sprockets. These chains are often used in parallel strands with detachable cross-rods fitted through the pin bores of the two parallel strands of chain.

These chains sometimes are assembled with modified design attachment pin link plates or roller link plates to adapt the chains to more versatile use in conveying operations.

Over the years, hollow pin chains became widely used and many manufacturers offered them. About 1990, it was suggested by the ASME B29 Committee that a standard for these chains was needed. In 1995, the Roller Chain Technical Committee of the American Chain Association established a subcommittee to develop such a standard.

Customary inch-pound units were used in tabulating dimensional information in this standard. Additionally, metric conversions of those units, in accordance with ASME Guide SI-1, ASME Orientation and Guide for Use of SI (Metric) Units, are also provided.

This Standard was approved by the American National Standards Institute on March 20, 2002.

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Chains, Attachments, and Sprockets for Power Transmission and Conveying

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SINGLE-PITCH AND DOUBLE-PITCH HOLLOW PIN CONVEYOR CHAINS AND ATTACHMENTS

1 SCOPE

This standard covers the dimensional limits required for chain interchangeability on sprockets. It does not provide for interconnectability of chains or individual links from different manufacturers.

2 HOLLOW PIN CHAINS

2.1 Definitions and Nomenclature

connecting link: an outside link consisting of a pin link plate, *E*, two hollow pins, *G-G*, a detachable pin link plate, *D*, and two retainers, *H-H* (see Figs. 1 and 2).

hollow pin chain, double-pitch: a series of alternately assembled roller links and pin links in which the hollow pins articulate inside the bushings. The pitch of the link plates is twice that of the link plates of the base series chain. Pin link plates and roller link plates have identical straight-edged contours. Chains may have large rollers that are intended for use when the conveyed load is carried by the rollers (see Figs. 3 and 4).

hollow pin chain, single-pitch: a series of alternately assembled roller links and pin links in which the hollow pins articulate inside the bushings (see Fig. 5).

pin link: an outside link consisting of two pin link plates, *E-E*, and two hollow pins, *F-F* (see Figs. 6 and 7).

roller link, double-pitch, large roller series: an inside link consisting of two roller link plates, *A-A*, two bushings, *B-B*, and two rollers of the large roller series, C_L-C_L (see Fig. 8).

roller link, double-pitch, small roller series: an inside link consisting of two roller link plates, *A-A*, and two bushings, *B-B* (see Fig. 9).

roller link, single-pitch: an inside link consisting of two roller link plates, *A-A*, and two bushings, *B-B* (see Fig. 10).

2.2 General Proportions

2.2.1 Single-Pitch

(a) The roller diameter approximately equals $0.625 \times P$ (P = pitch).

(b) The chain width is defined as the distance between roller link plates and approximately equals $0.625 \times P$.

(c) The bore of the hollow pin approximately equals $0.312 \times P$.

(d) The thickness of link plates approximately equals $0.125 \times P$.

(e) The maximum height of pin and roller link plates equals $0.95 \times P$.

2.2.2 Double-Pitch

(a) The roller diameter for the small roller series approximately equals $0.312 \times P$ and for the large roller series approximately equals $0.625 \times P$.

(b) The chain width is defined as the distance between roller link plates and approximately equals $0.312 \times P$.

(c) The bore of the hollow pin approximately equals $0.156 \times P$.

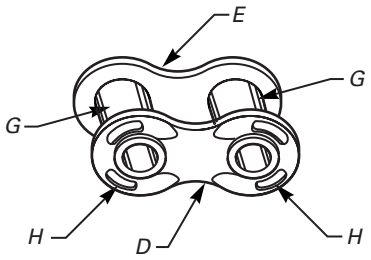


FIG. 1 SINGLE-PITCH CONNECTING LINK

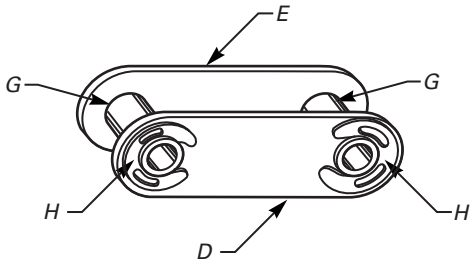


FIG. 2 DOUBLE-PITCH CONNECTING LINK

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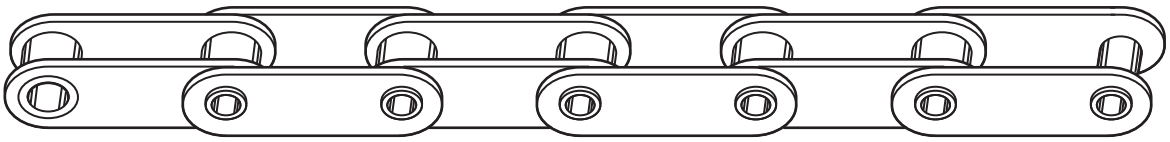


FIG. 3 DOUBLE-PITCH HOLLOW PIN CHAIN WITH SMALL ROLLERS

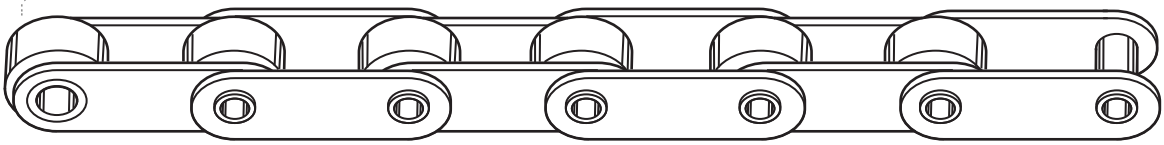


FIG. 4 DOUBLE-PITCH HOLLOW PIN CHAIN WITH LARGE ROLLERS

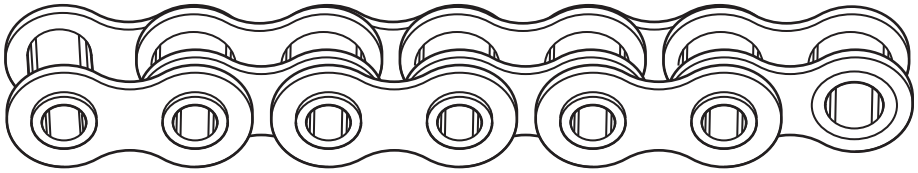


FIG. 5 SINGLE-PITCH HOLLOW PIN CHAIN

(d) The thickness of link plates approximately equals $0.062 \times P$.

(e) The maximum height of pin and roller link plates equals $0.475 \times P$.

2.3 Numbering System

Single-pitch hollow pin chains are identified by the same basic chain number as in ASME B29.1 followed by the suffix *HP*.

Double-pitch hollow pin chains are identified by the same basic chain number as in ASME B29.4 followed by the suffix *HP*.

2.4 Minimum Ultimate Tensile Strength

Single strand hollow pin chains, conforming to this standard, shall have a minimum ultimate tensile strength, or breaking strength, equal to or exceeding the values listed in Table 1.

The minimum ultimate tensile strength (M.U.T.S.) for chains covered by this standard is the minimum force at which an unused, undamaged chain could fail when subjected to a single tensile loading test.

(a) WARNING: The minimum ultimate tensile strength is NOT a "working load." The M.U.T.S. greatly exceeds the maximum force that may be applied to the chain.

(b) Test Procedure. A tensile force is slowly applied, in uniaxial direction, to the ends of the chain sample.

(c) The tensile test is a destructive test. Even though the chain may not visibly fail when subjected to the *minimum ultimate tensile force*, it will have been damaged and will be unfit for service.

2.5 Chain Length Accuracy

2.5.1 Chain Length Tolerance. An unused, undamaged chain, with standard measuring load applied, shall not be underlength. An unused, undamaged chain, with standard measuring load applied, shall not exceed the overlength shown in the following tabulation.

Base Chain Numbers	Overlength Limit	
	in./ft	mm/m
40, C2040, C2042	+0.038	3.17
50, C2050, C2052	+0.036	3.00
60, C2060, C2062	+0.034	2.83
80, C2080, C2082	+0.032	2.67

2.5.2 Standard Measuring Load and Length. Measuring load is the load that shall be applied to the chain while it is measured for length. Measuring load is equal to 1% of the M.U.T.S., with a minimum of 31 lb (138 N).

Chain length measurements shall be taken over a length of at least 12 in. (300 mm).

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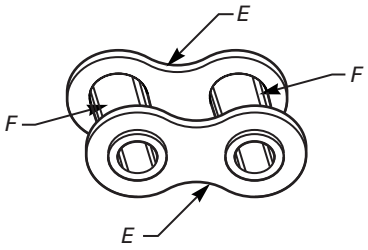


FIG. 6 SINGLE-PITCH PIN LINK

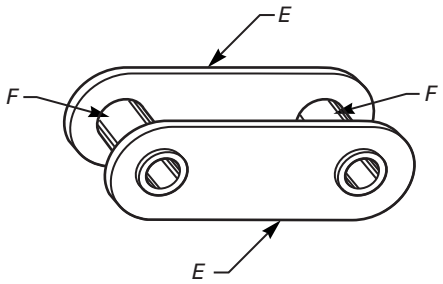


FIG. 7 DOUBLE-PITCH PIN LINK

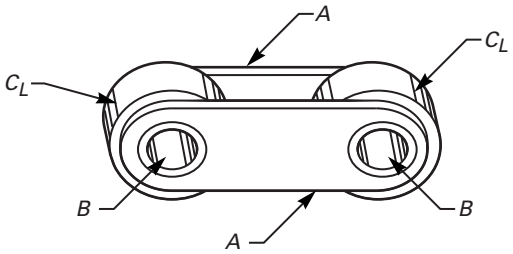


FIG. 8 DOUBLE-PITCH ROLLER LINK WITH LARGE ROLLERS

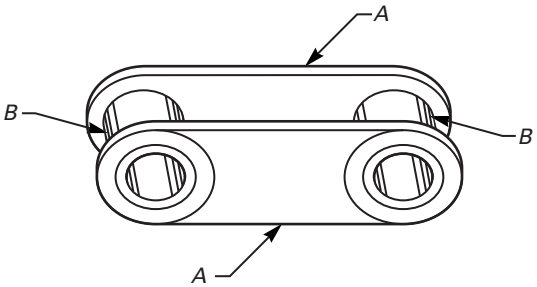


FIG. 9 DOUBLE-PITCH ROLLER LINK WITH SMALL ROLLERS

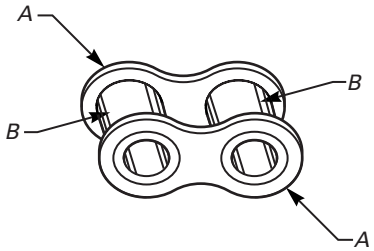


FIG. 10 SINGLE-PITCH ROLLER LINK

2.5.3 Chain Length Matching for Parallel Operation. Chains intended to operate in parallel may be matched to closer tolerances.

2.6 Chain Dimensions

See Fig. 11 and Table 1.

2.7 Attachment Link Plates for Hollow Pin Chains

Attachment link plates and limiting dimensions for attachment link plates for single-pitch hollow pin chains are listed in ASME B29.1.

Attachment link plates and limiting dimensions for attachment link plates for double-pitch hollow pin chains are listed in ASME B29.4.

Extended pins normally are not offered for hollow pin chains.

3 SPROCKETS

Sprocket types, tooth forms, and tooth section profiles are as shown in ASME B29.1.

For single-pitch hollow pin chains, sprocket diameters are as listed in ASME B29.1.

For double-pitch hollow pin chains, sprocket diameters are as listed in ASME B29.4.

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TABLE 1 GENERAL CHAIN DIMENSIONS, LIMITING DIMENSIONS FOR INTERCHANGEABILITY, MEASURING LOADS, AND ULTIMATE TENSILE STRENGTHS

Standard Chain Number	Dimensions, in. (mm)															
	40HP		50HP		60HP		80HP		C2040HP C2042HP		C2050HP C2052HP		C2060HP C2062HP		C2080HP C2082HP	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
Chain Pitch, *P*	0.500	(12.70)	0.625	(15.875)	0.750	(19.05)	1.000	(25.40)	1.000	(25.40)	1.250	(31.75)	1.500	(38.10)	2.000	(50.80)
Roller Diameter																
Small, D_S, Max.	0.312	(7.92)	0.400	(10.16)	0.469	(11.91)	0.625	(15.88)	0.312	(7.92)	0.400	(10.16)	0.469	(11.91)	0.625	(15.88)
Large, D_L, Max.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0.625	(15.88)	0.750	(19.05)	0.875	(22.23)	1.125	(28.58)
Width Between Roller Link Plates, *W*, Min.	0.309	(7.85)	0.370	(9.40)	0.495	(12.57)	0.620	(15.75)	0.309	(7.85)	0.370	(9.40)	0.495	(12.57)	0.620	(15.75)
Roller Link Width, Max.	0.440	(11.18)	0.545	(13.84)	0.699	(17.75)	0.890	(22.61)	0.440	(11.18)	0.545	(13.84)	0.699	(17.75)	0.890	(22.61)
Distance Between Pin Link Plates, Min.	0.442	(11.23)	0.547	(13.89)	0.701	(17.81)	0.892	(22.66)	0.442	(11.23)	0.547	(13.89)	0.701	(17.81)	0.892	(22.66)
Hollow Pin Bore Diameter, D_b Min.	0.1567	(4.00)	0.2004	(5.12)	0.2346	(5.98)	0.3126	(7.96)	0.1567	(4.00)	0.2004	(5.12)	0.2346	(5.98)	0.3126	(7.96)
Measuring Load, lb (N)	31	(138)	31	(138)	51	(227)	92	(409)	31	(138)	31	(138)	51	(227)	92	(409)
Min. Ultimate Tensile Strength, lb (N)	1,750	(7 784)	2,500	(11 120)	5,100	(22 686)	9,200	(40 924)	1,750	(7 784)	2,500	(11 120)	5,100	(22 686)	9,200	(40 924)
Width Over Regular Pin, *B*, Max.	0.66	(16.76)	0.82	(20.83)	1.02	(25.91)	1.30	(33.02)	0.66	(16.76)	0.82	(20.83)	1.02	(25.91)	1.30	(33.02)
Add to *B* for Conn. Pin, Max.	0.05	(1.27)	0.06	(1.52)	0.06	(1.52)	0.06	(1.52)	0.05	(1.27)	0.06	(1.52)	0.06	(1.52)	0.06	(1.52)

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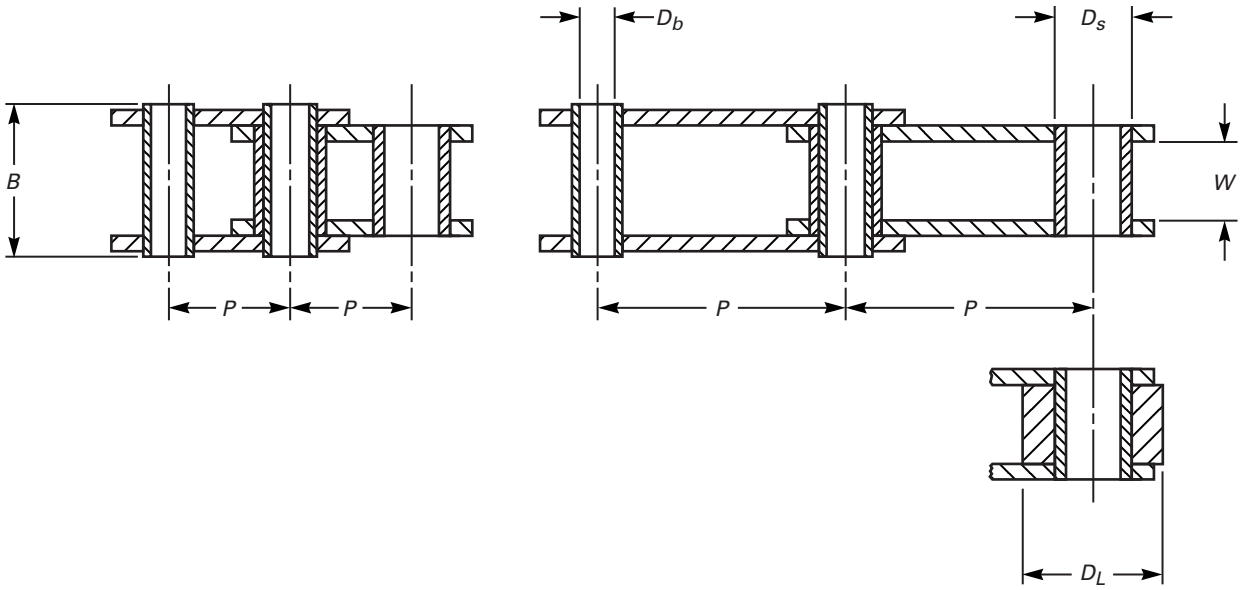


FIG. 11 GENERAL CHAIN DIMENSIONS

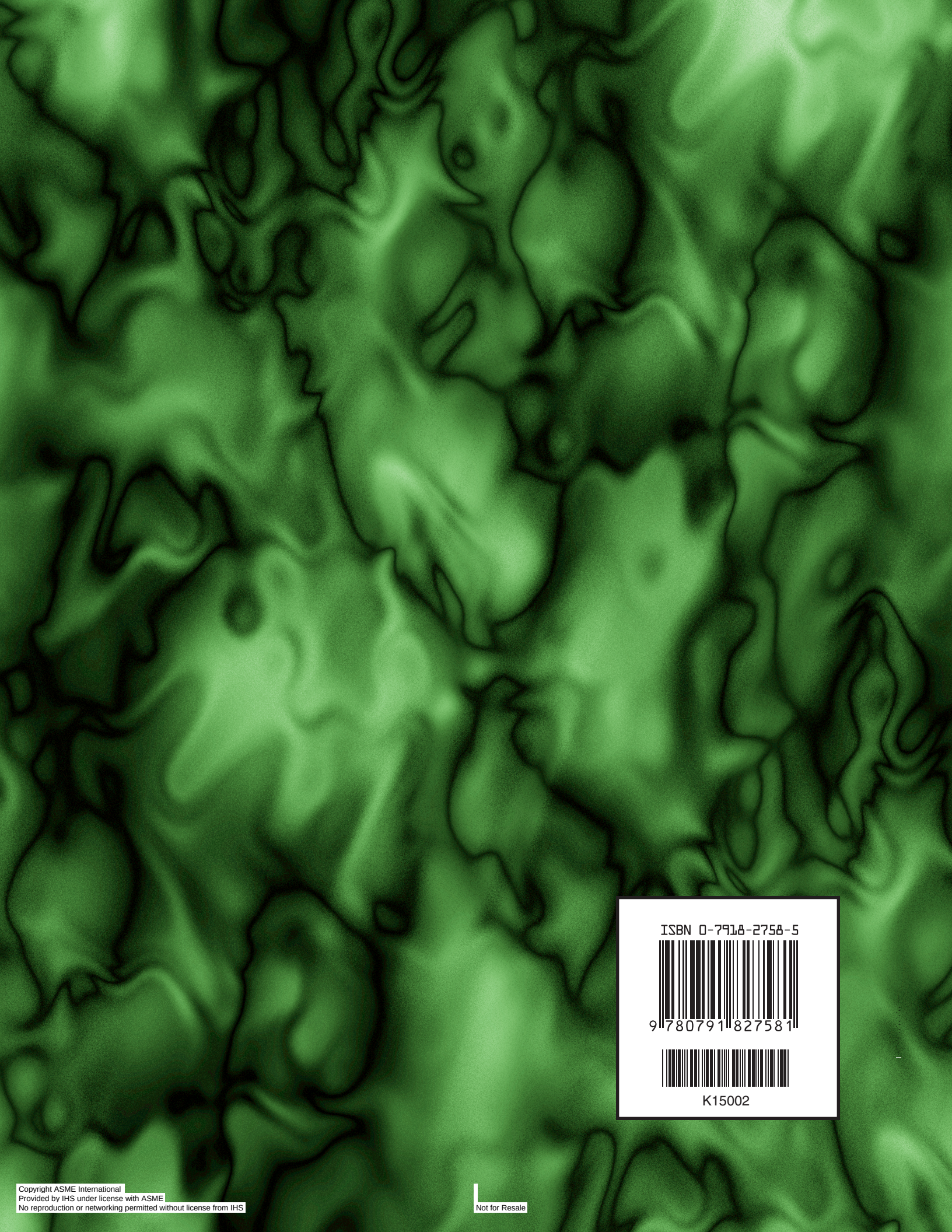
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