Useful Magnets Useful Magnets

Useful Magnets Torque Chart Instruction Manual

Comprehensive Reference Tightening Torque Chart for SAE & Metric Bolts

1. Introduction

The Useful Magnets Comprehensive Reference Tightening Torque Chart is an indispensable tool designed to provide accurate and reliable torque specifications for both SAE and Metric bolts. This durable, magnetic chart simplifies the process of bolt tightening, ensuring proper assembly, enhanced safety, and improved efficiency in various mechanical and industrial applications. Its compact and waterproof design makes it suitable for use in diverse environments, from professional workshops to home garages.

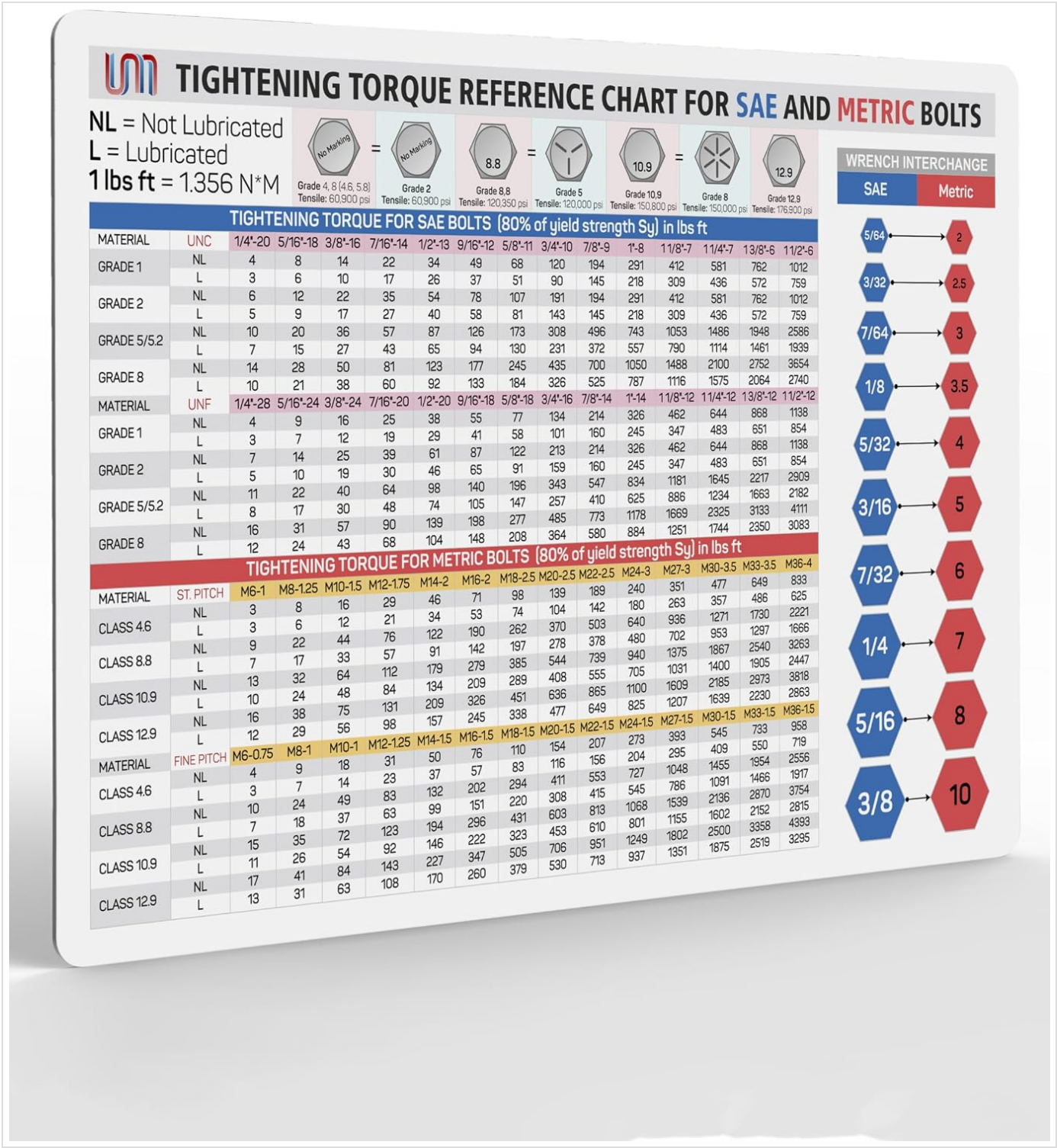
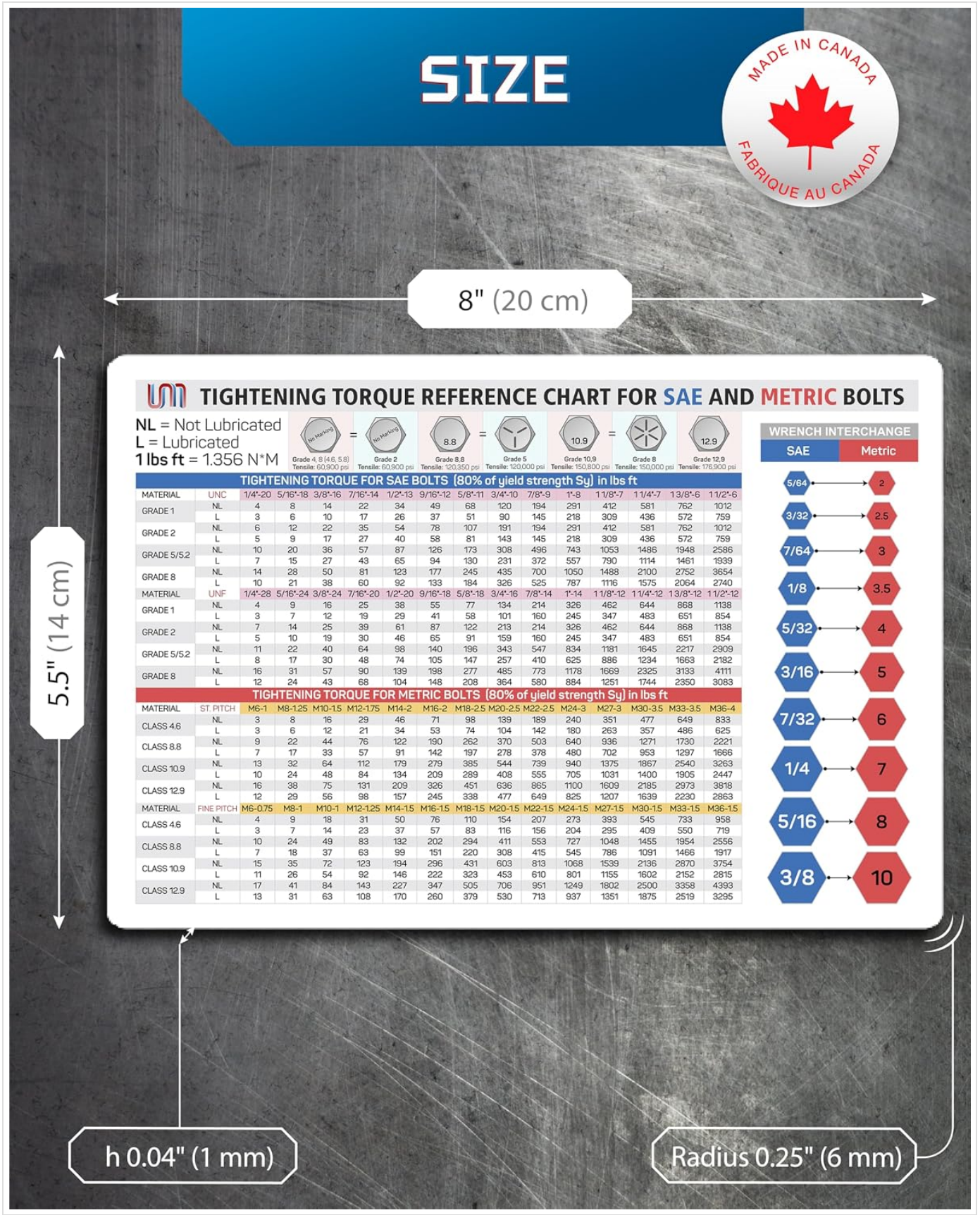


Image 1.1: The Useful Magnets Comprehensive Reference Tightening Torque Chart, displaying detailed torque values for SAE and Metric bolts, along with a wrench interchange guide.

2. Key Features

- **Comprehensive Torque Reference:** Provides extensive tightening torque specifications for both SAE (UNC and UNF 1/4" to 1-1/2") and Metric (Standard and Fine Pitch M6 to M36) bolts. Includes values for both lubricated and non-lubricated conditions across various grades (SAE Grade 1, 2, 5/5.2, 8) and classes (Metric Class 4.6, 8.8, 10.9, 12.9).
- **Magnetic Design:** Engineered as a magnet poster, allowing for easy and secure attachment to any metal surface, such as toolboxes, workbenches, or machinery. This ensures the chart is always accessible and visible.
- **Wrench Interchange Chart:** Features a dedicated section for quick conversion between SAE and Metric wrench sizes, covering the 10 most common sizes to aid in tool selection.

- **Additional Informational Data:** Includes supplementary details such as recommended lubricants for bolt installation, prevailing torque values, and important notes for proper bolt assembly, enhancing its utility for precision work.
- **Durable and Waterproof Construction:** Manufactured from high-quality, durable materials, this chart is designed to withstand demanding workshop environments. Its waterproof nature ensures readability and integrity even in humid or wet conditions.
- **Compact and Portable:** With dimensions of 8" x 5.5", the chart is conveniently sized for easy storage and transport in toolboxes, backpacks, or pockets, making it ideal for professionals and DIY enthusiasts on the go.
- **Enhanced Safety and Efficiency:** By providing accurate torque values, the chart helps prevent under-tightening (leading to loose connections) and over-tightening (causing damage), thereby promoting safer and more reliable mechanical connections.
- **Versatile Application:** Suitable for a wide range of industries and tasks, including automotive, construction, industrial maintenance, and general mechanical assembly.



TIGHTENING TORQUE FOR SAE BOLTS (80% of yield strength Sy) in lbs ft

MATERIAL	UNC	1/4"-20	5/16"-18	3/8"-16	7/16"-14	1/2"-13	9/16"-12	5/8"-11	3/4"-10	7/8"-9	1"-8	1 1/8"-7	1 1/4"-7	1 3/8"-6	1 1/2"-6
GRADE 1	NL	4	8	14	22	34	49	68	120	194	291	412	581	762	1012
	L	3	6	10	17	26	37	51	90	145	218	309	436	572	759
GRADE 2	NL	6	12	22	35	54	78	107	191	194	291	412	581	762	1012
	L	5	9	17	27	40	58	81	143	145	218	309	436	572	759
GRADE 5/5.2	NL	10	20	36	57	87	126	173	308	496	743	1053	1486	1948	2586
	L	7	15	27	43	65	94	130	231	372	557	790	1114	1461	1939
GRADE 8	NL	14	28	50	81	123	177	245	435	700	1050	1488	2100	2752	3654
	L	10	21	38	60	92	133	184	326	525	787	1116	1575	2064	2740
MATERIAL	UNF	1/4"-28	5/16"-24	3/8"-24	7/16"-20	1/2"-20	9/16"-18	5/8"-18	3/4"-16	7/8"-14	1"-14	1 1/8"-12	1 1/4"-12	1 3/8"-12	1 1/2"-12
GRADE 1	NL	4	9	16	25	38	55	77	134	214	326	462	644	868	1138
	L	3	7	12	19	29	41	58	101	160	245	347	483	651	854
GRADE 2	NL	7	14	25	39	61	87	122	213	214	326	462	644	868	1138
	L	5	10	19	30	46	65	91	159	160	245	347	483	651	854
GRADE 5/5.2	NL	11	22	40	64	98	140	196	343	547	834	1181	1645	2217	2909
	L	8	17	30	48	74	105	147	257	410	625	886	1234	1663	2182
GRADE 8	NL	16	31	57	90	139	198	277	485	773	1178	1669	2325	3133	4111
	L	12	24	43	68	104	148	208	364	580	884	1251	1744	2350	3083

TIGHTENING TORQUE FOR METRIC BOLTS (80% of yield strength Sy) in lbs ft

MATERIAL	ST. PITCH	M6-1	M8-1.25	M10-1.5	M12-1.75	M14-2	M16-2	M18-2.5	M20-2.5	M22-2.5	M24-3	M27-3	M30-3.5	M33-3.5	M36-4
CLASS 4.6	NL	3	8	16	29	46	71	98	139	189	240	351	477	649	833
	L	3	6	12	21	34	53	74	104	142	180	263	357	486	625
CLASS 8.8	NL	9	22	44	76	122	190	262	370	503	640	936	1271	1730	2221
	L	7	17	33	57	91	142	197	278	378	480	702	953	1297	1666
CLASS 10.9	NL	13	32	64	112	179	279	385	544	739	940	1375	1867	2540	3263
	L	10	24	48	84	134	209	289	408	555	705	1031	1400	1905	2447
CLASS 12.9	NL	16	38	75	131	209	326	451	636	865	1100	1609	2185	2973	3818
	L	12	29	56	98	157	245	338	477	649	825	1207	1639	2230	2863
MATERIAL	FINE PITCH	M6-0.75	M8-1	M10-1	M12-1.25	M14-1.5	M16-1.5	M18-1.5	M20-1.5	M22-1.5	M24-1.5	M27-1.5	M30-1.5	M33-1.5	M36-1.5
CLASS 4.6	NL	4	9	18	31	50	76	110	154	207	273	393	545	733	958
	L	3	7	14	23	37	57	83	116	156	204	295	409	550	719
CLASS 8.8	NL	10	24	49	83	132	202	294	411	553	727	1048	1455	1954	2556
	L	7	18	37	63	99	151	220	308	415	545	786	1091	1466	1917
CLASS 10.9	NL	15	35	72	123	194	296	431	603	813	1068	1539	2136	2870	3754
	L	11	26	54	92	146	222	323	453	610	801	1155	1602	2152	2815
CLASS 12.9	NL	17	41	84	143	227	347	505	706	951	1249	1802	2500	3358	4393
	L	13	31	63	108	170	260	379	530	713	937	1351	1875	2519	3295

Image 2.1: The torque chart illustrating its compact dimensions, making it highly portable and convenient for various workspaces.

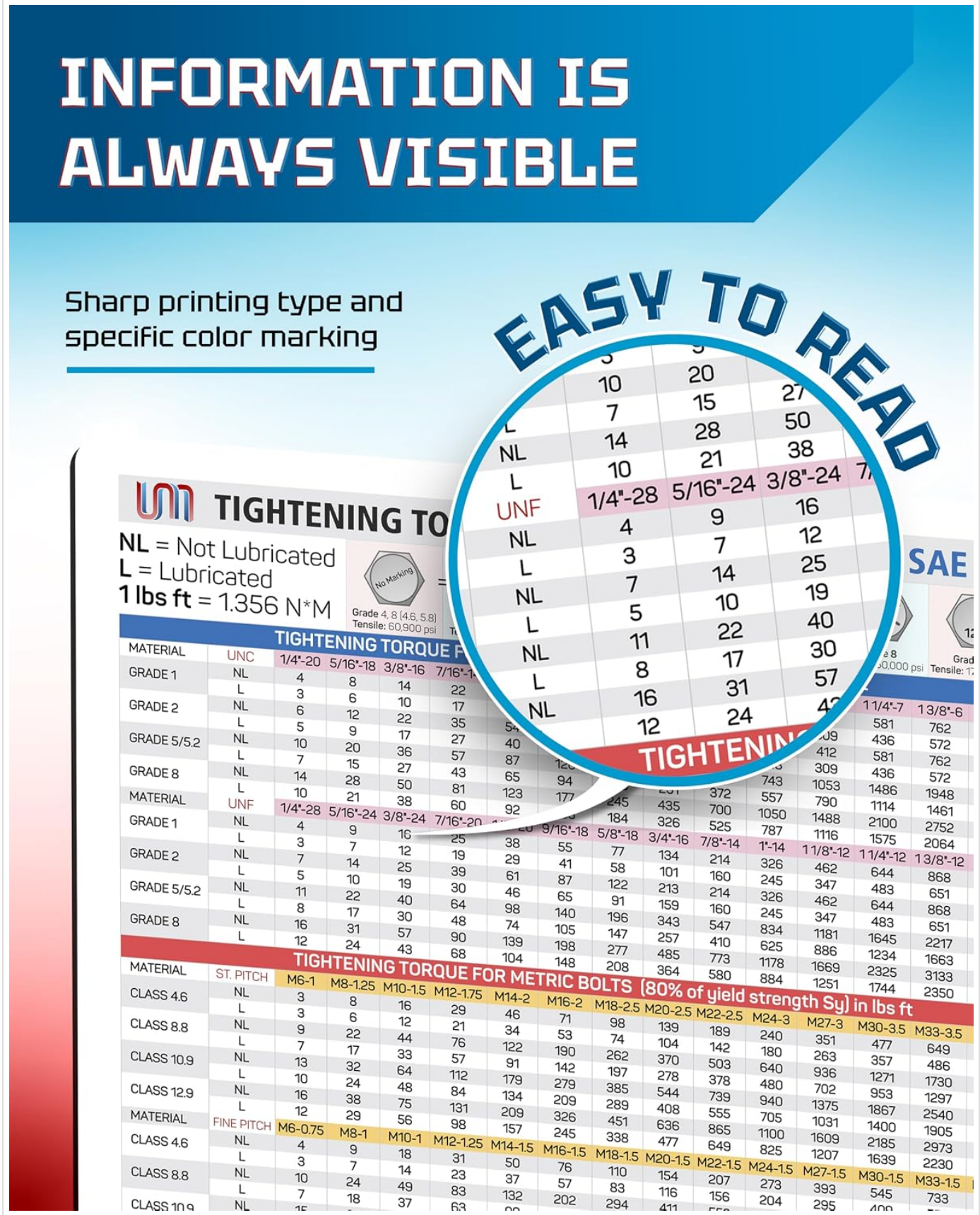


Image 2.2: A detailed view of the chart's clear text and sharp color marking, ensuring information is always easy to read.

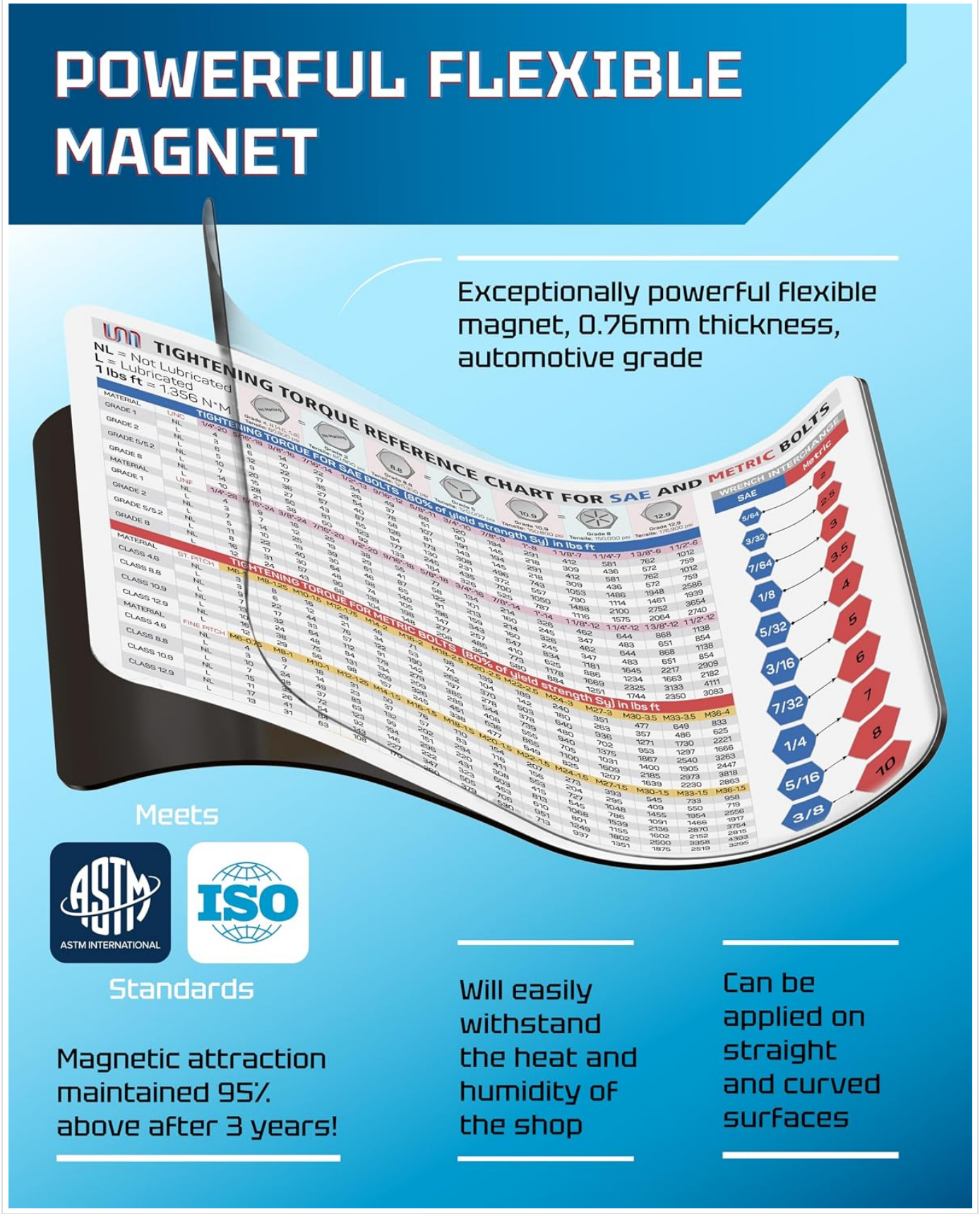


Image 2.3: The chart's powerful flexible magnet, 0.76mm thick and automotive grade, ensures secure attachment to metal surfaces.

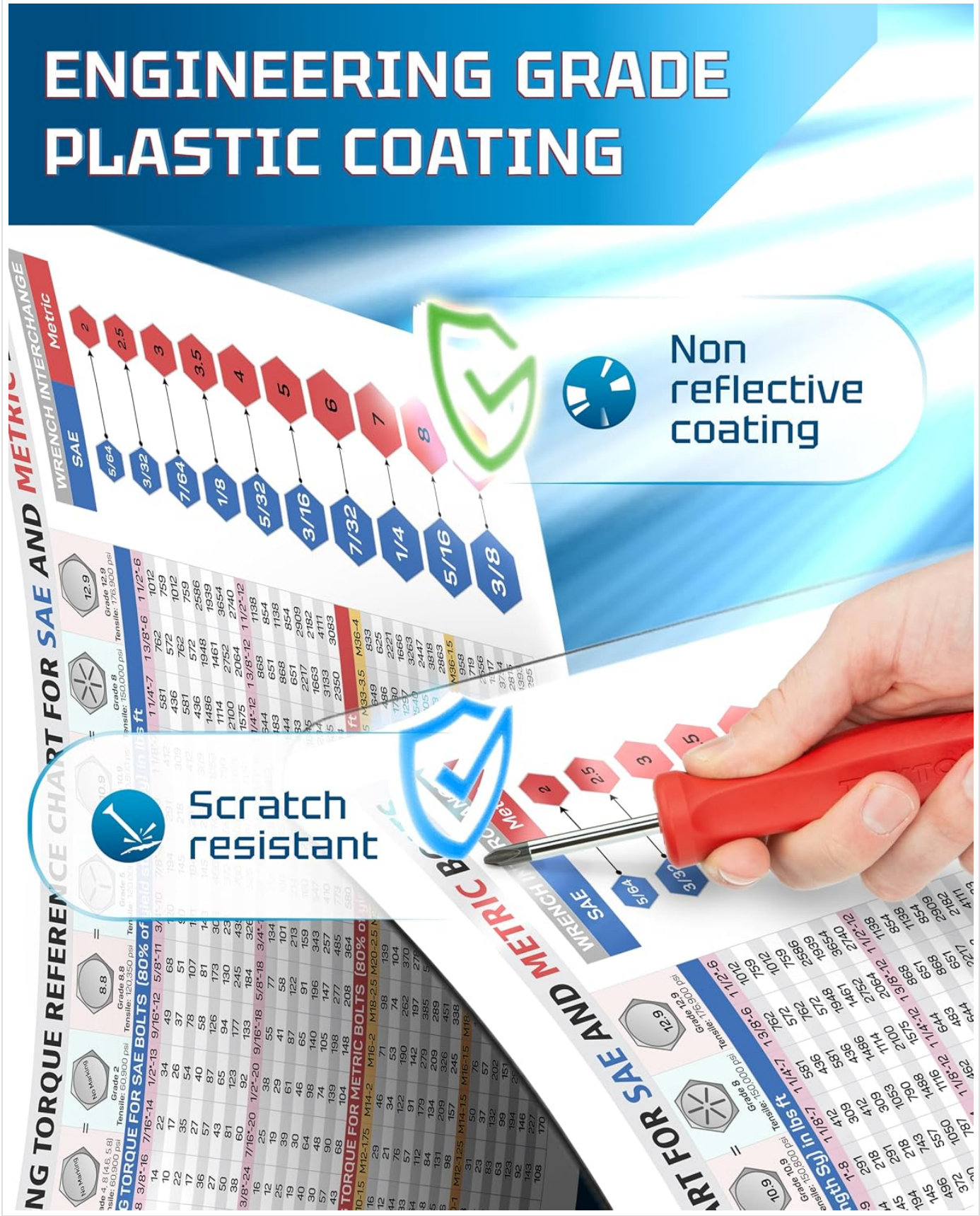


Image 2.4: The engineering-grade plastic coating provides a non-reflective, scratch-resistant surface for enhanced durability and readability.



Image 2.5: The chart's strong and durable construction, featuring waterproof material and rounded corners for additional longevity.

3. Technical Information and Specifications

Brand: Useful Magnets

Model: Comprehensive Reference Tightening Torque Chart

Size: 8" x 5.5"

Overall Dimensions: Approximately 9 x 6 x 0.2 inches

Shape: Square

Material: Plastic, Flexible Magnetic Sheeting

Item Weight: 3.53 ounces (100 Grams)

Country of Origin: Canada

Finish Type: Powder Coated

Operation Mode: Manual Reference

Torque Specifications Covered:

- **SAE Bolts (80% of yield strength Sy) in lbs Ft:**
  - UNC: 1/4" through 1-1/2"
  - UNF: 1/4" through 1-1/2"
  - Grades: 1, 2, 5/5.2, 8 (for both lubricated and non-lubricated conditions)
- **METRIC Bolts (80% of yield strength Sy) in lbs Ft:**
  - Standard Pitch: M6 through M36
  - Fine Pitch: M6-0.75 through M36-1.5
  - Classes: 4.6, 8.8, 10.9, 12.9 (for both lubricated and non-lubricated conditions)
- **Wrench / Spanner Interchange Chart:** SAE to Metric conversion for 10 most common sizes.

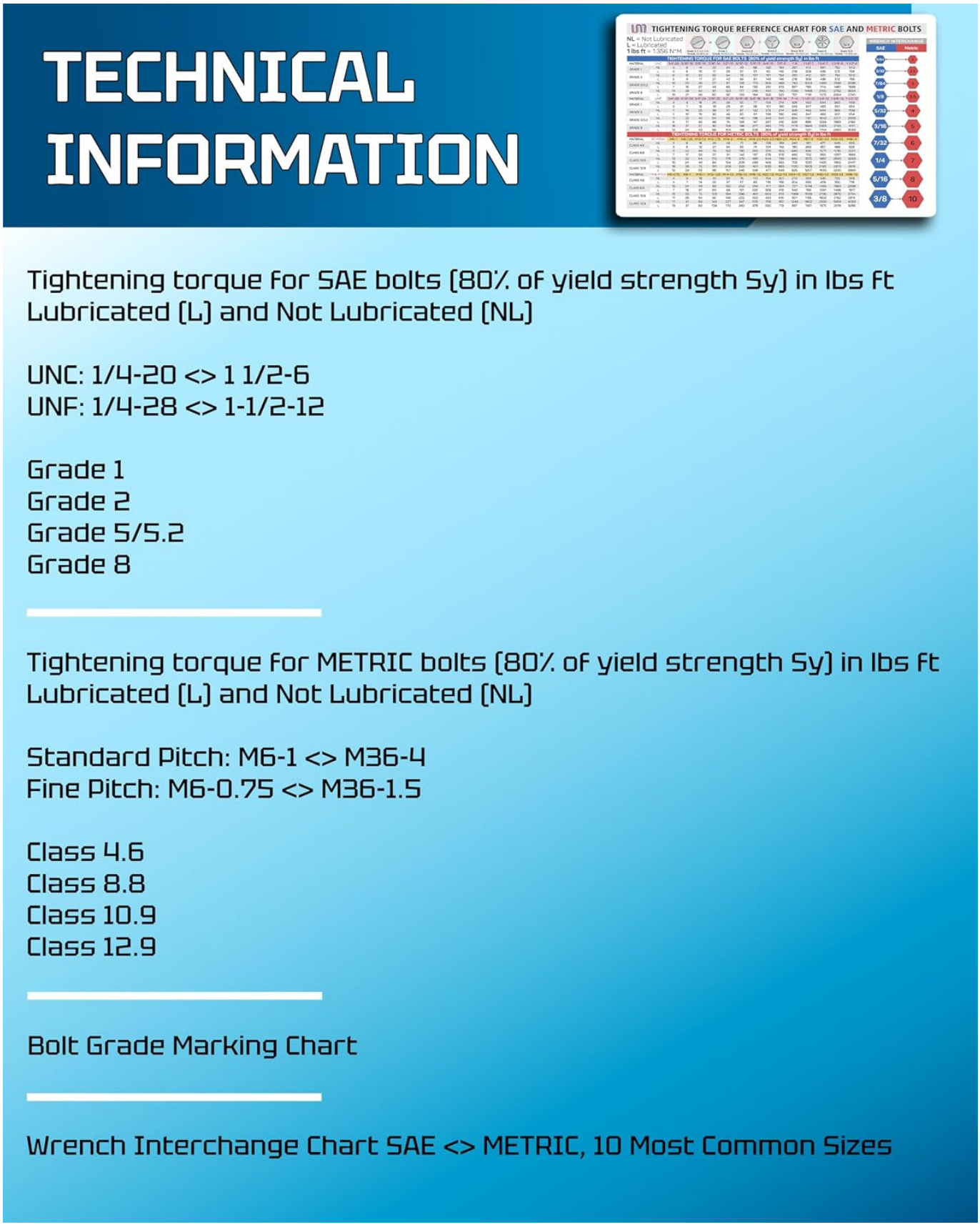


Image 3.1: A visual representation of the technical information provided on the chart, including SAE and Metric bolt specifications.

4. Usage and Operating Instructions

The Useful Magnets Torque Chart is designed for straightforward reference. To use the chart effectively:

1. **Placement:** Attach the magnetic chart to any convenient metal surface in your workspace, such as a toolbox, workbench, or machinery. Ensure it is placed where it can be easily seen and accessed during work.

2. **Identify Bolt Type:** Determine if the bolt you are working with is SAE (Imperial) or Metric.
3. **Identify Bolt Size and Grade/Class:** Locate the specific size (e.g., 1/2 inch, M10) and the corresponding grade (for SAE) or class (for Metric) of your bolt. This information is often stamped on the bolt head.
4. **Lubrication Status:** Ascertain whether the bolt and threads are lubricated or not. Select the appropriate column on the chart (L for Lubricated, NL for Not Lubricated).
5. **Find Torque Value:** Cross-reference the bolt size, grade/class, and lubrication status to find the recommended tightening torque value in lbs Ft.
6. **Wrench Selection (Optional):** If unsure of the correct wrench size, refer to the Wrench Interchange Chart section to find the equivalent SAE or Metric size.
7. **Apply Torque:** Use a calibrated torque wrench to apply the specified torque to the bolt.

Always ensure your torque wrench is properly calibrated for accurate results. The chart provides general guidelines; for critical applications, always consult the equipment manufacturer's specific torque requirements.

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Video 4.1: An official product video demonstrating the versatility and practical applications of the Useful Magnets Torque Chart in various industries, including metalworking, woodworking, automotive, aerospace, home use, and electrical work.

5. Care and Maintenance

To ensure the longevity and continued readability of your Useful Magnets Torque Chart, follow these simple care instructions:

- **Cleaning:** Wipe the surface with a soft, damp cloth to remove dust, grease, or grime. Avoid abrasive cleaners or solvents that could damage the protective coating.
- **Storage:** Store the chart on a flat metal surface or in a clean, dry place when not in use. Avoid folding or creasing the chart, as this may affect its magnetic properties or readability over time.
- **Avoid Extreme Temperatures:** While durable, prolonged exposure to extreme heat or cold may affect the magnetic material. Store in a moderate environment.
- **Protect from Sharp Objects:** Although scratch-resistant, avoid contact with sharp objects that could potentially damage the chart's surface.

6. Troubleshooting

This product is a static reference chart and typically does not encounter operational issues. However, if you experience any problems related to its physical properties, consider the following:

- **Chart Not Sticking to Surface:**
  - Ensure the surface is ferrous metal (e.g., steel, iron). The chart will not stick to aluminum, plastic, or wood.
  - Check if the surface is clean and free of excessive dust, oil, or debris that might interfere with magnetic contact.
  - Verify the chart's magnetic side is facing the metal surface.
- **Difficulty Reading Text:**
  - Ensure adequate lighting in your workspace.
  - Clean the chart's surface as described in the Care and Maintenance section.
  - Avoid placing the chart in direct sunlight or under harsh glare, as the non-reflective coating works best in diffused light.

7. Warranty and Support

Useful Magnets stands behind the quality of its products. While specific warranty details are not provided in this manual, for any questions regarding product defects, performance, or general inquiries, please contact Useful Magnets customer support through their official channels or the retailer from whom the product was purchased.
For more information and to explore other products, visit theUseful Magnets Store.

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