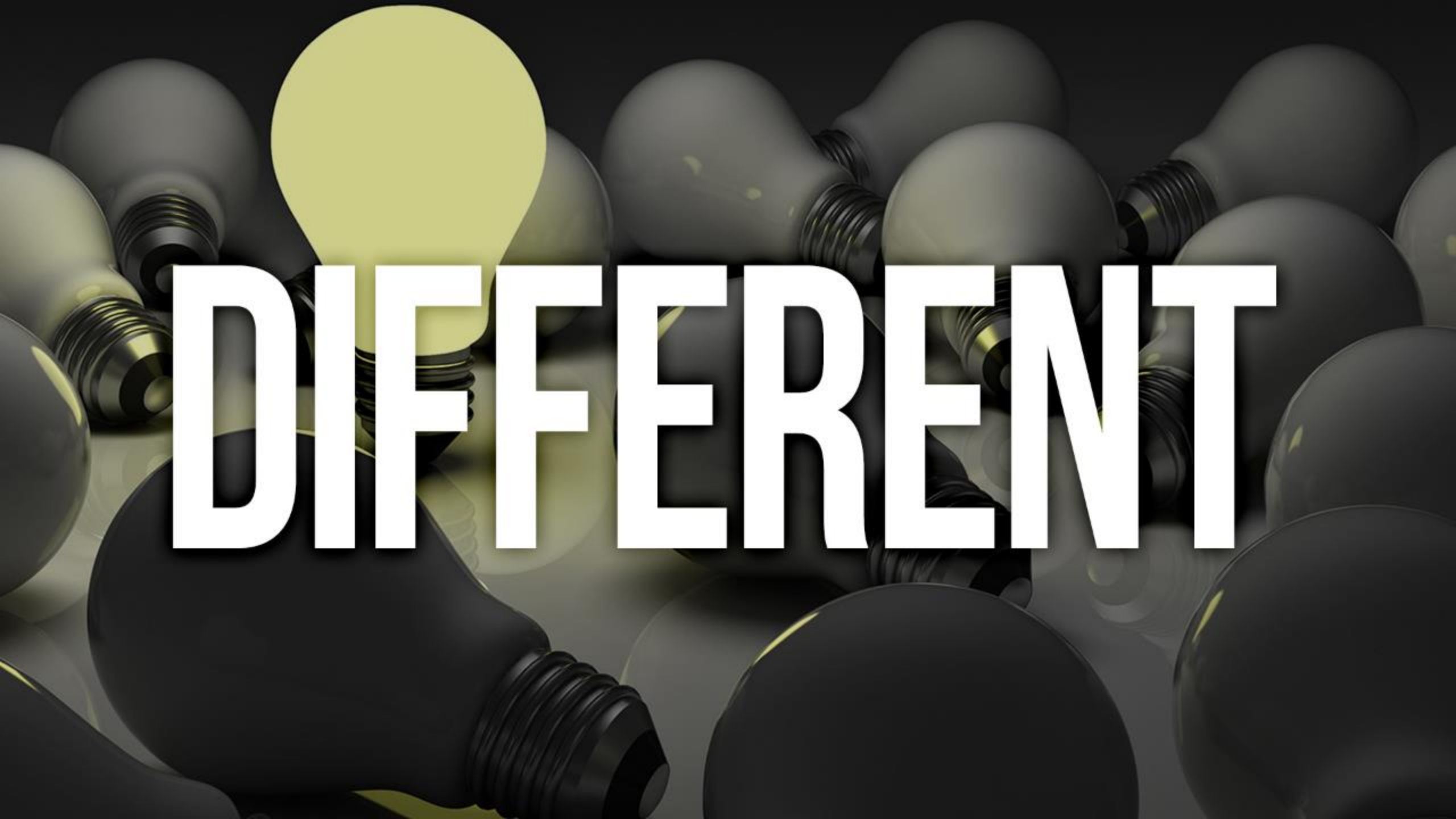

REAL VALUE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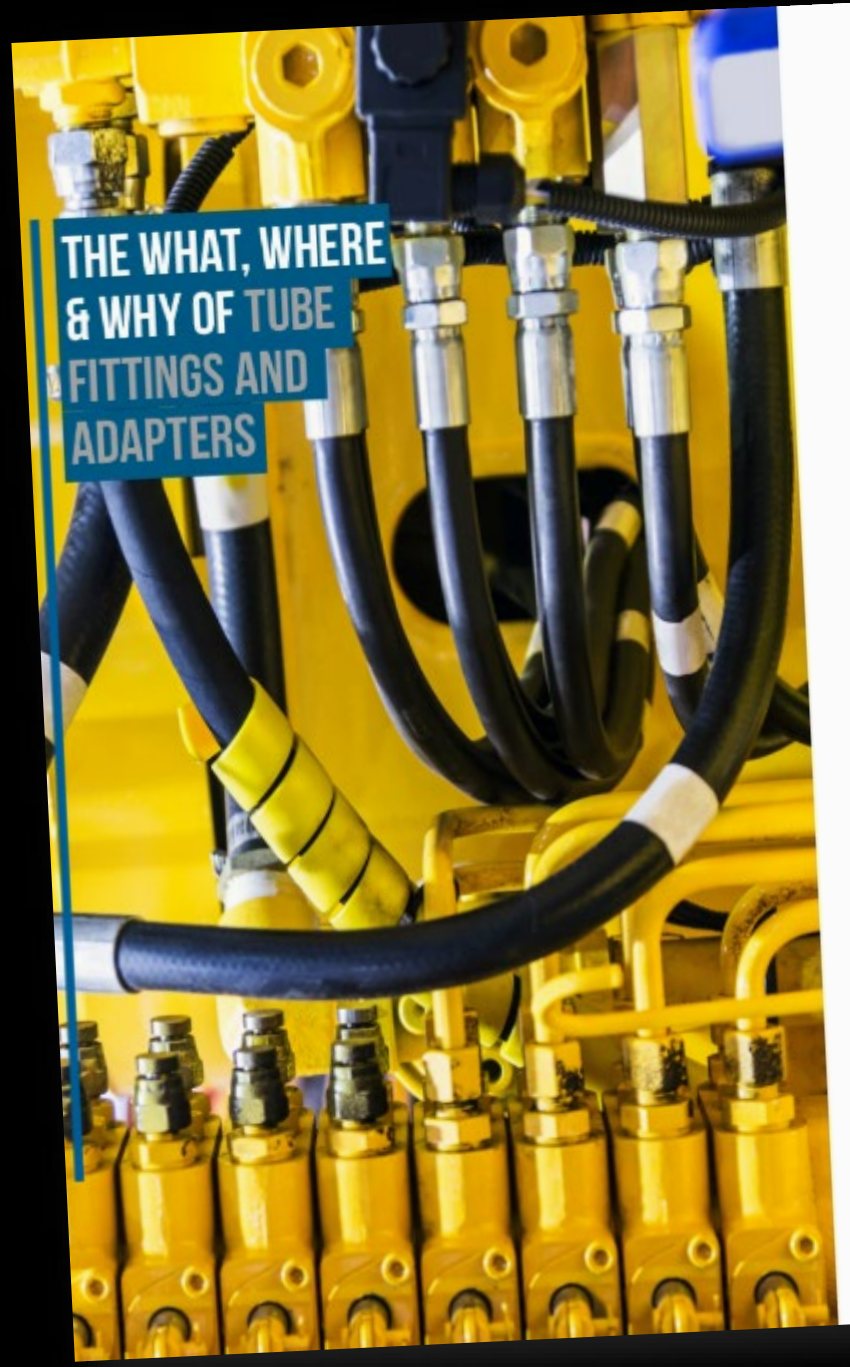
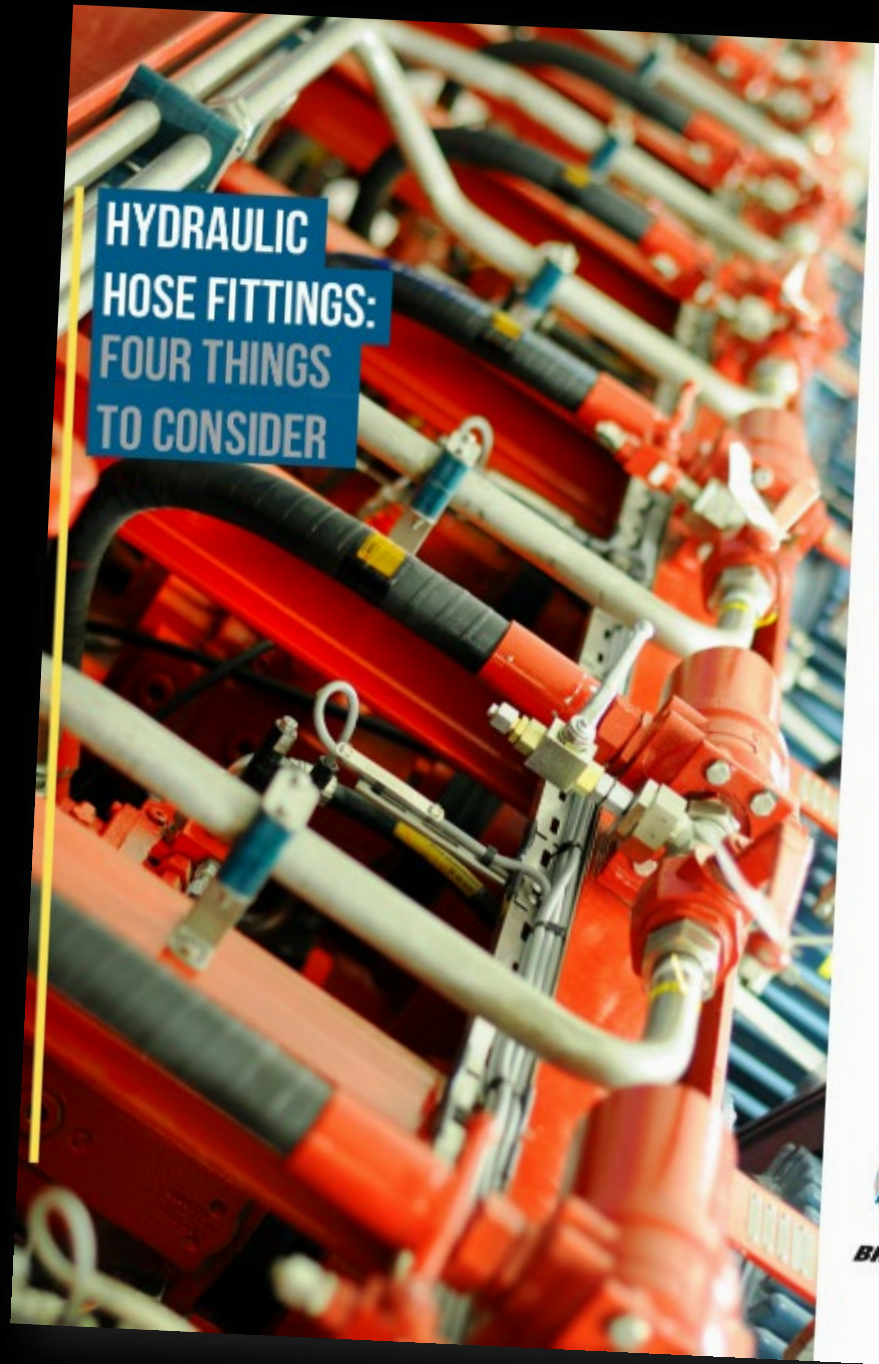


THE WHAT, WHERE & WHY OF TUBE FITTINGS AND ADAPTERS

BRENNAN



HYDRAULIC HOSE FITTINGS: FOUR THINGS TO CONSIDER

BRENNAN

Posted on August 28, 2019

Strong Supply Chain. Strong Business.

According to a survey by Deloitte, organizations with superior supply chain capabilities demonstrate significantly above average performance on both revenue growth and EBIT (Earnings Before Interest and Taxes) when compared to industry average:

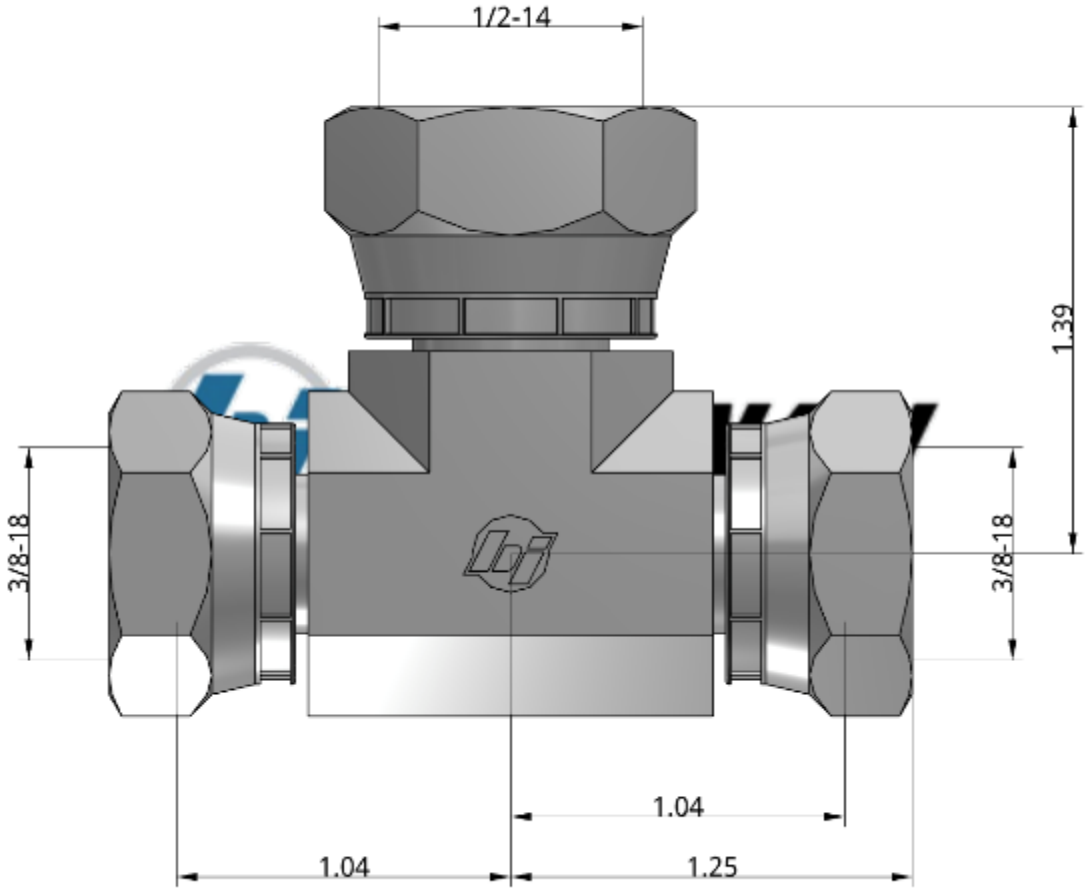
Posted on August 20, 2019

From Intimidation to Collaboration in Supplier Relationships

Supply Chain Efficiencies With Trusted Qualified Vendors

Up until the 1970s and '80s General Motors had dozens of autonomous manufacturing plants that did their own thing. Each plant had their own vendors and largely operated on their own schedules. Then in 1984, GM purchased Electronic Data Systems (EDS) in an effort to tie together cross functional operations and eliminate redundancies through more real-time data communication. EDS founder Ross Perot joined the GM board of directors and became GM's largest individual stockholder while retaining control of EDS as chairman.


NPT FITTINGS
HOW TO IDENTIFY
NPT (NATIONAL PIPE TAPERED) FITTINGS
CHARACTERISTICS • APPLICATIONS • OPTIONS • SIMILARITIES
CONTRASTS • ADVANTAGES • DISADVANTAGES
04:10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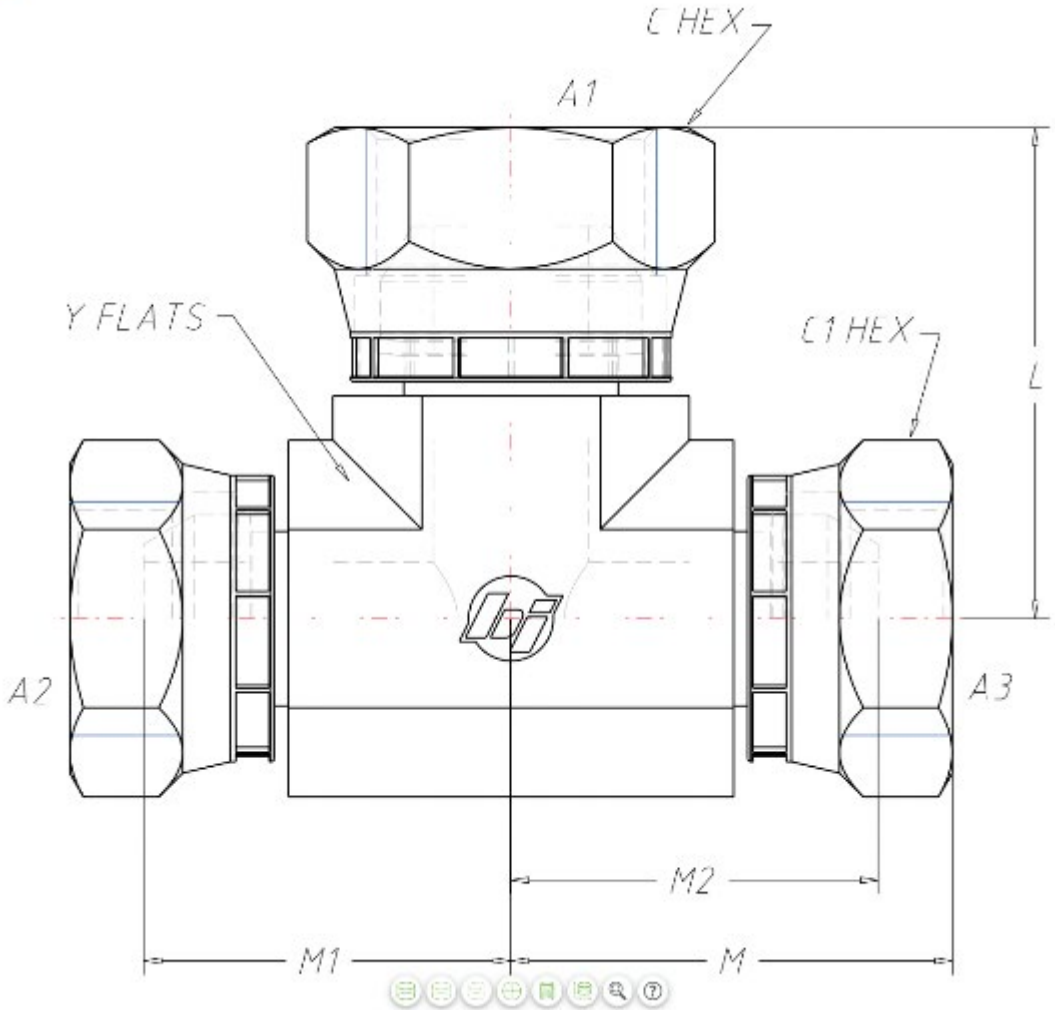
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A1
Y FLATS
C1 HEX
L
A2
A3
M2
M1
M

Pressure Ratings

By Series

1603 | Any Material | PSI BAR | Get Ratings

-OR- By Part Number

1603 | PSI BAR | Get Ratings

Results: 1603

Models/Data provided are for reference only, and many factors are involved in the proper selection of a product for any application. Suitability, function, adequate ratings and other system design factors are critically important, and are the responsibility of the designer/user.

Part Number	Material	Pressure (PSI)
1603-02-02-02	Steel	5000
1603-02-02-02-FG	Steel	5000
1603-04-04-04	Steel	5000
1603-04-04-04-FG	Steel	5000
1603-04-04-06-FG	Steel	4000
1603-06-06-06	Steel	4000
1603-06-06-06-FG	Steel	4000
1603-06-06-08-FG	Steel	3500
1603-08-06-06-FG	Steel	3500

Results: 12 Records Found

	Competitor Part	Brennan Part	Description	List Price
Search Catalog	Voss: 1160322057	D209873	ST ETVD 22 L	$61.44
Search Catalog	Voss: 1160372057	D211041	ST ETVD 28 L	$90.82
Search Catalog	Voss: 1160372057	D101790	ETVD 28 L	$439.35
Search Catalog	Voss: 160322007	D210521	ST ETV 22 L	$55.13
Search Catalog	Voss: 160332007	D213223	ST XETV 22 L	$44.58
Search Catalog	Voss: 160372007	D200417	ST ETV 28 L	$82.77
Search Catalog	Voss: 160382007	D213674	ST XETV 28 L	$84.60
Search Catalog	Fastenal: 421603	5605-04-04-04-FG	04FP-04FP-04FP Tee Forg	$5.65
Search Catalog	Fastenal: 421603	5605-04-04-04	ItemNumber not found in Web Database	Call
Search Catalog	Fastenal: 421603	5605-04-04-04-SS	04FP-04FP-04FP Tee Stnls	$56.04
Search Catalog	Fastenal: 99521603	D202607	ST UM 10 L	$1.02
Search Catalog	Fastenal: 99521603	D105123	UM 10 L	$5.77

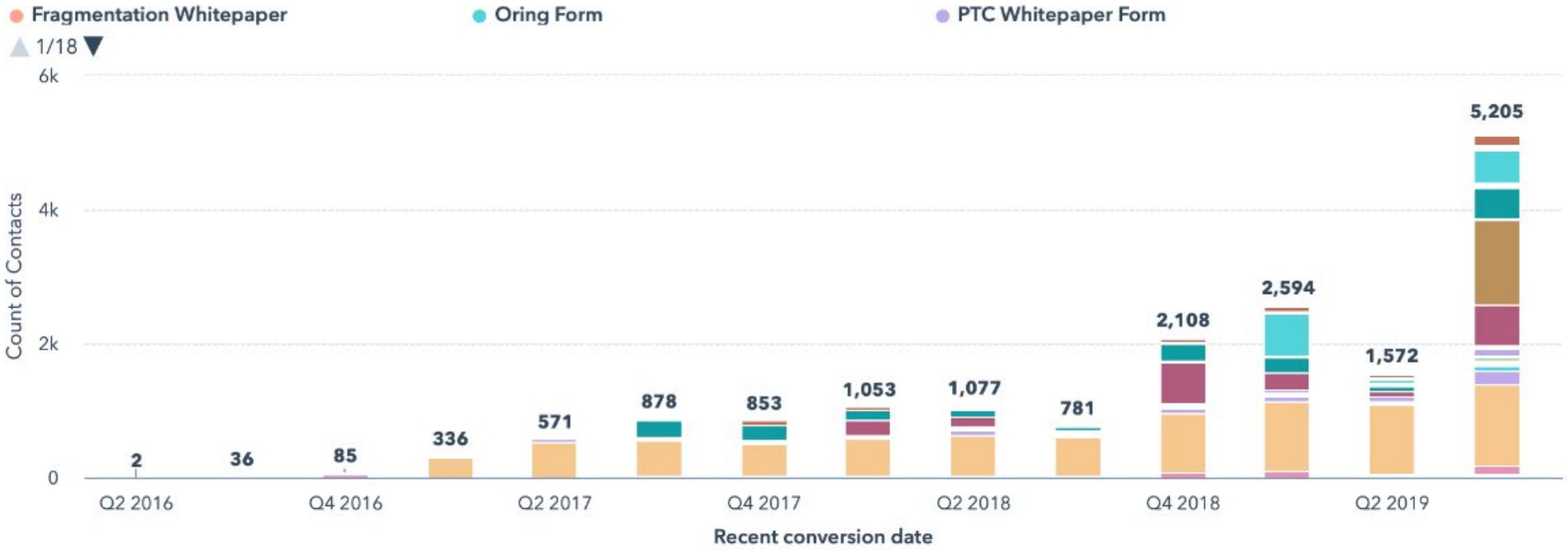

REAL VALUE

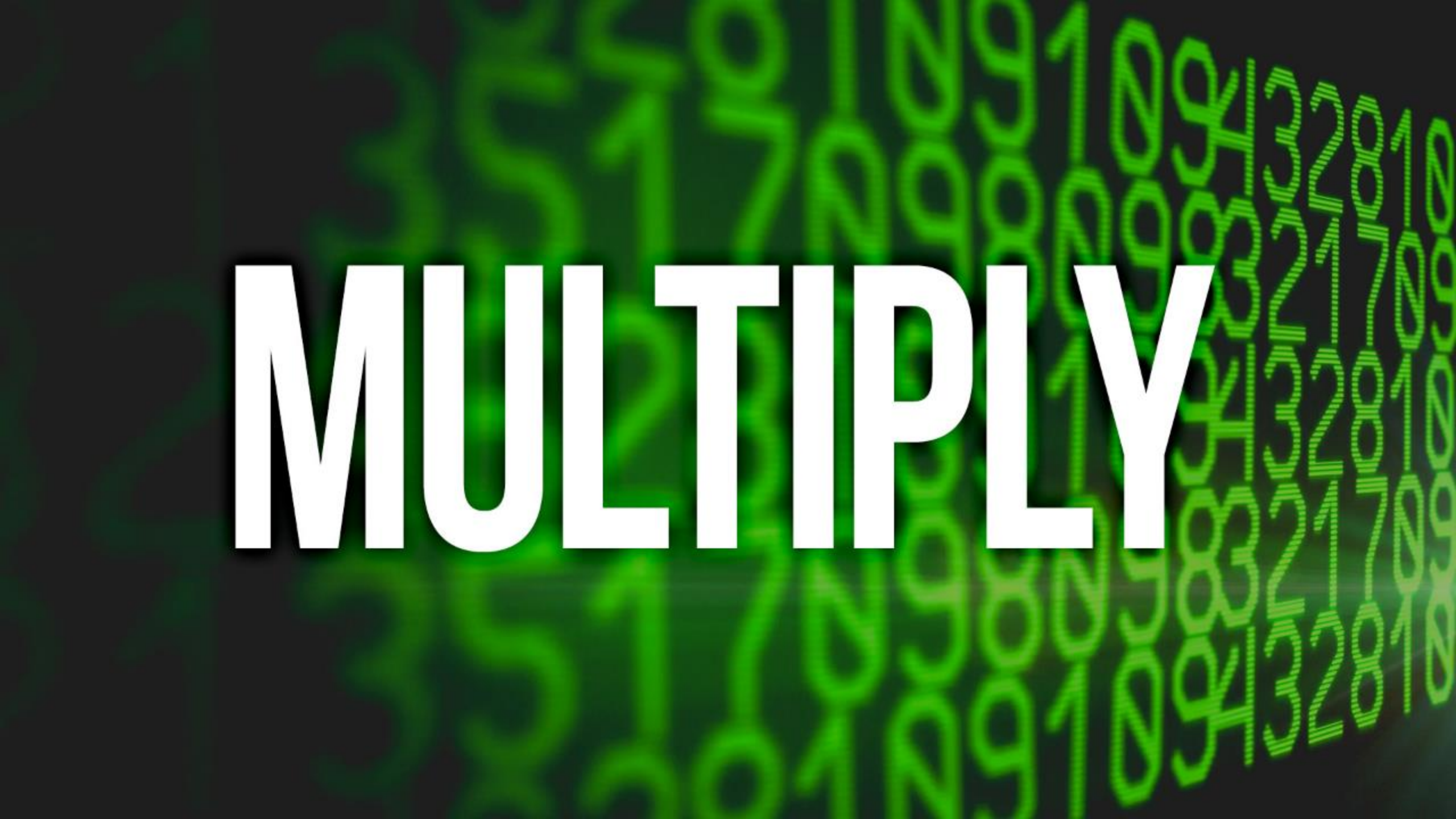

LISTEN

Forms All Time

Actions

Date range: All time | Frequency: Quarterly Report settings




MULTIPLY


SUPPLY CHAIN
EFFICIENCIES
WITH TRUSTED
QUALIFIED VENDORS

BRENNAN

SUPPLY CHAIN EFFICIENCIES WITH TRUSTED QUALIFIED VENDORS

Up until the 1970s and '80s General Motors had dozens of autonomous manufacturing plants that did their own thing. Each plant had their own vendors and largely operated on their own schedules. Then in 1984, GM purchased Electronic Data Systems (EDS) in an effort to tie together cross functional operations and eliminate redundancies through more real-time data communication. EDS founder Ross Perot joined the GM board of directors and became GM's largest individual stockholder while retaining control of EDS as chairman. Two years later the GM board was having issues with Perot and paid him $700 million to step down. Rumor had it that since EDS controlled all of GM's data and communications Perot knew he had his hand on the proverbial "plug" and could pull it at any time. It was a power play and it wasn't long before the GM board figured it out. The intentions were good, but the result was a temporary disaster.

Fast forward to 2019 with rumors of a GM and Ford merger. Perhaps the world's largest industry consolidation. Today, OEMs can no longer compete as autonomous corporations. Beyond consolidation of operations, they also compete in integrated supply chains. It is no longer economically feasible for individual OEM plants to have their own personal pool of vendors. Instead, they are consolidating pools of trusted qualified vendors that, for the most part, they need to share.

From Management by Intimidation to Collaborative Relationships

Not long ago the strategy to control costs was for OEMs to use aggressive negotiating and demanding terms and conditions that squeezed supplier profitability and often weakened the supplier's business or drove them out of business. However, in recent years OEMs have embarked on more strategic partnerships to promote long-term relationships with their collective supply chains. These qualified and trusted supplier partnerships provide more sustainable benefits for all parties involved.

This transformation in industrial product supply is changing how many products are designed, manufactured and delivered. These changes are proving to be more dramatic than the GM and EDI merger 35 years ago. This time the results appear very promising with changes in supply chains and the optimization of their performance. The results are enhancing the supply chain landscape for large OEMs and the suppliers. They may be competing for the same parts, but now they can focus more on what their good at; designing and manufacturing high quality equipment.

Businesses Succeed by the Success of Their Suppliers

According to a survey by Deloitte, organizations with superior supply chain capabilities demonstrate significantly above average performance on both revenue growth and EBIT (Earnings Before Interest and Taxes) when compared to industry average:

- 79 percent of organizations with superior supply chain capabilities ("supply chain leaders") achieve revenue growth that is significantly above average
- Only 8 percent of the organizations with lower performing supply chains ("supply chain followers") have above-average revenue growth
- 69 percent of supply chain leaders have an EBIT margin that is significantly above average compared to only 9 percent of supply chain followers

Supply Chain Leadership: Deloitte Touche Tohmatsu Limited

The fiscal strength of a company is largely impacted by the success of their supply chain. A deficient supply chain can play a major role in a company's inability to compete, or can even cause them to fail. A survey conducted by Tompkins Consortium reported that more than 50 percent of business leaders who participated considered their supply chain to be a standalone (autonomous) operating function. That's a dangerous way to think.

Controllable Supply Chain Costs

The cost of components and managing the supply can represent a large portion of the final equipment costs. Mismanagement of the supply chain can spiral out of control by incurring higher product and production costs, inventory overruns and strangling cash flow.

Some key considerations in managing the sometimes hidden cost overruns of the supply chain are:

- Fluctuating raw material costs
- Inaccurate forecasting
- Inventory carrying costs
- Poor inventory management
- Procurement management costs
- Redundancy in the supply chain
- Transportation costs

Of the above considerations the most dangerous can be inaccurate forecasting. It can also be one of the hardest to measure. Benchmarking only against last year or even last month is common, but

can also be irresponsible. Historical forecasting should play a part of the equation, but not all of it. Forecasted economic trends in the industry, new markets, volatile costs of raw materials, declining markets and how the OEM is able to address these should all play into forecasting what the company will require from its suppliers. And of course, this information should be shared with trusted vendors to allow them to effectively manage their forecasting so everyone remains stable and profitable.

4 Benefits of Sustainable Supplier Relationships

As OEM procurement departments develop strong supplier relationships they gain a solid understanding of the suppliers' business, products and services, ultimately fostering a dependable partnership. In turn, this allows the supplier to better understand the OEMs' needs and respond more effectively and efficiently. This fosters an increased economy of scale for both parties. Each organization is able to collaborate on product enhancements, new product development, managing inventories and exploring potential areas of consolidation.

❶ Efficiencies Through Long Term Cross Collaboration

The longer the supplier and OEM relationship, the more opportunity for increased efficiencies in collaborative business practices and shared end user market demands. A trusted long term relationship provides for greater opportunity of integrating common business practices, financial controls and supply management, and ensures a more reliable system of controlling product quality.

❷ Contract Cost Containment

The up-front management costs of establishing a new supplier contract is usually significant and time consuming. However, when there are established customer-vendor relationships the continuity eliminates the vendor "revolving door". There should still be semi-annual, annual or biennial reviews to fine tune processes or establish updated protocol. Yet having long term vendor relationships is less costly, and more operationally efficient than frequently establishing new vendors in what can be a deep supply chain at large OEMs. Focusing on established qualified vendors rather than broadening the vendor base leads to fewer incidents of negative performance and lowers operational costs.

❸ Managing Market Instabilities

The volatility of vendor raw material, transportation and operational costs can trickle up to the OEM. However, a solid collaborative relationship provides the combined parties with stronger negotiating power to help mitigate volatile market conditions. To keep the relationship honest the OEM must still measure all weighted factors such as vendor product pricing, inventory creep and opportunities of sharing in the vendor's cost reductions when they occur. Yet as external market conditions change so should the conditions of the relationship. Instead of fixed vendor pricing for instance, both organizations should be able to share in margin increases (and losses).

❹ Process Improvement

Mutual process improvements can be gained by both the supplier and OEM when they maintain a long term service-level agreement (SLA). Working to ensure the contract requirements are being met, the buyer and vendor can work closely to improve processes and procedures that benefit each party by implementing enhanced Key Performance Indicators (KPI), working on new or improved product development and other performance activities that help each organization maintain a healthy return on investment. Improvements can also be met by collectively working to lower inventory carrying costs, implement Just-in-Time (JIT) delivery and maintain flexibility in product demand and supply requirements. This flexibility helps both the vendor and buyer to manage and improve their margins.

CONCLUSION: FROM SUPPLY CHAIN PERFORMANCE TO CUSTOMER SATISFACTION

Any company that is able to compete in today's environment puts end user customer satisfaction in the forefront of their strategy. And it's impossible to satisfy customers without a dependable supply chain. If an OEM cannot ensure stability in the components used to build their product they will ultimately drive customers (or dealers) to the competition. Though controllable, if allowed to creep in the following factors will severely damage their reputation.

- Delays in new product introduction that marketing is already promoting (it happens more often than we like to admit)
- Long lead times
- Lack of readily available spare parts
- Mismanagement of their aftermarket
- Inability to fulfill customer service requirements
- Low fill rates
- Poor product quality

A well managed supply chain made up of select trusted qualified vendors will reduce the occurrences of the issues outlined above, support the distribution network and retain customer satisfaction. When manufacturers and vendors develop a mutually beneficial relationship, all parties can succeed. Henry Ford may have been able to get away with what color his first cars were ("You can have your car in any color you want, as long as it's black"), but it's well established he knew the importance of collaboration; "If everyone is moving forward together, then success takes care of itself."

An industry will only thrive when all parties work together by having responsible and ethical practices at the forefront of their businesses. And customers will keep coming back if those principles are clear to them. When there is satisfaction across all partners in the manufacturing of a product or equipment, the trickle up effect is to the end use customer's perception. And it's a well known fact; perception is reality.

ABOUT BRENNAN

In business for over 65 years, Brennan supplies customers worldwide with more than 50,000 standard and special hydraulic fittings, adapters and O-rings in sizes ranging from 1/16 to 3 inches. These include a wide choice of fitting and adapter types such as tube, O-ring face seal, instrumentation, metric bite type, push-to-connect, conversion and flareless bite type, as well as valves, clamps and swivels. Brennan products are stocked at strategically located, full-service distribution centers across North America, Europe and Asia.

SOURCES:

Defense Logistics Agency

Ernst & Young Global Limited

Logistics Bureau

National Academies of Sciences, Engineering and Medicine

Office Team

Spend Matters® Solutions Intelligence for Procurement

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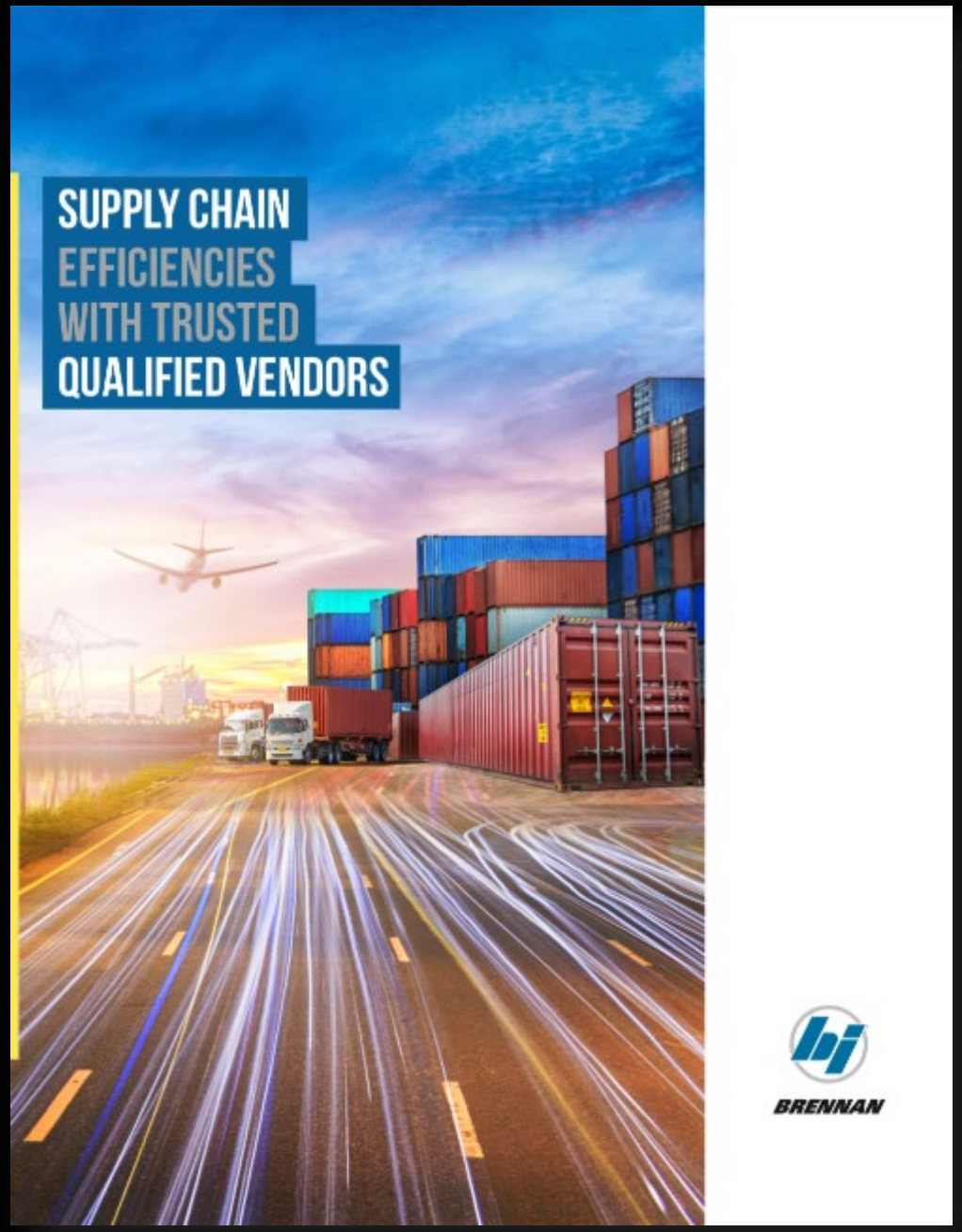

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The Role of Procurement in Fragmentation

The Critical Role of Procurement

Procurement departments play an essential role in ensuring success of material requirements planning's **(MRP)** impact on production scheduling, materials forecasting and inventory control to manage an efficient manufacturing process. MRP systems at OEM companies are software-based and used to plan purchasing and on time delivery of outsourced components, as well as the entire manufacturing process.

How Big Data Will Create Leverage for Supply Chains

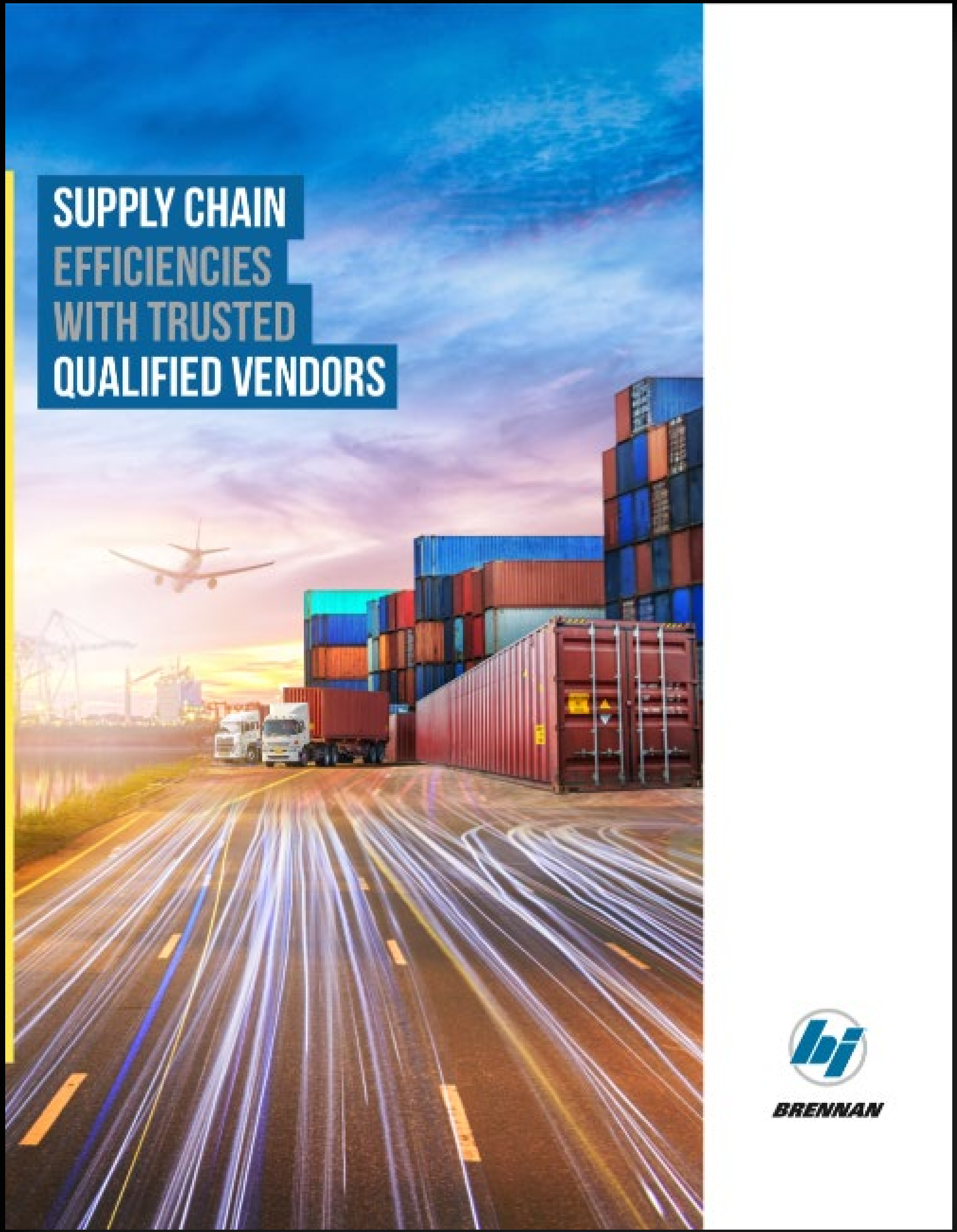
The Big Impact of Big Data on Supply Chains

There is a tremendous amount of untapped information that can be leveraged as supply chains become more complex and fragmented. That 'hidden' information can be extracted from data that already exists within the OEM and/or resources outside its walls in the form of 'Big Data'. Big data is used to understand current, and calculate future behaviors and preferences of customers.

Managing Fragmentation and Remaining Competitive

A Changing World: Location, Location, Location

There are still ways to manage fragmentation and remain competitive. Because construction equipment OEMs are competing in a vast global market, supply chains must quickly adapt and respond to market pressures. Speed to market and the ability to react quickly to changes in customer demand are crucial. As emphasized by DHL International, a global leader in the logistics industry, it requires **"a global network of more regionalized supply chains that are closer to markets and customers".**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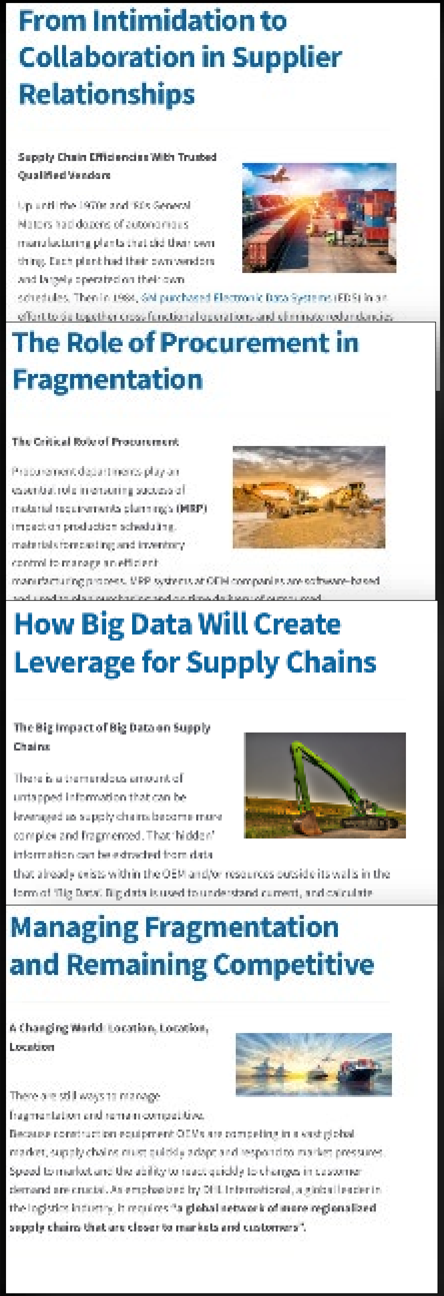
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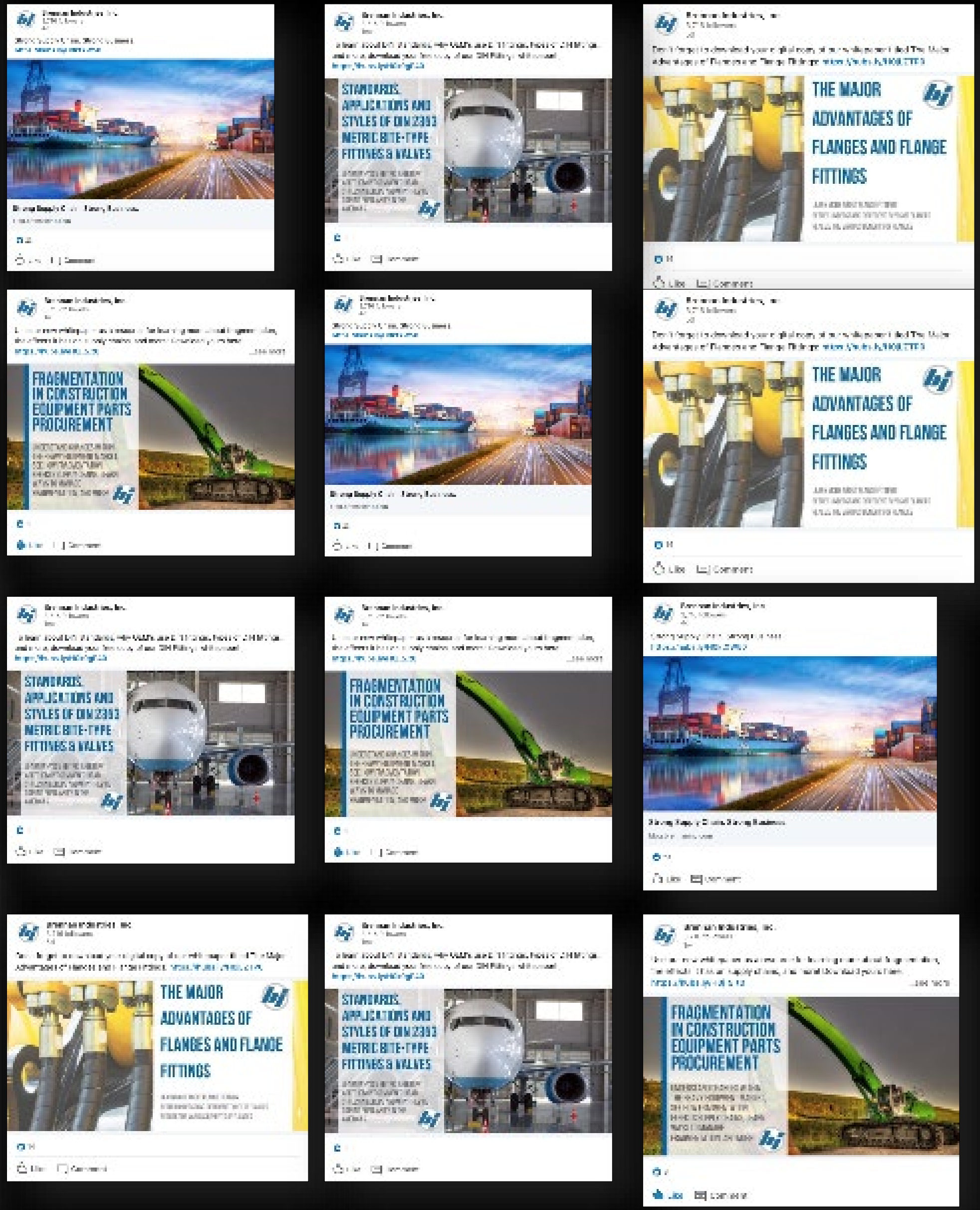
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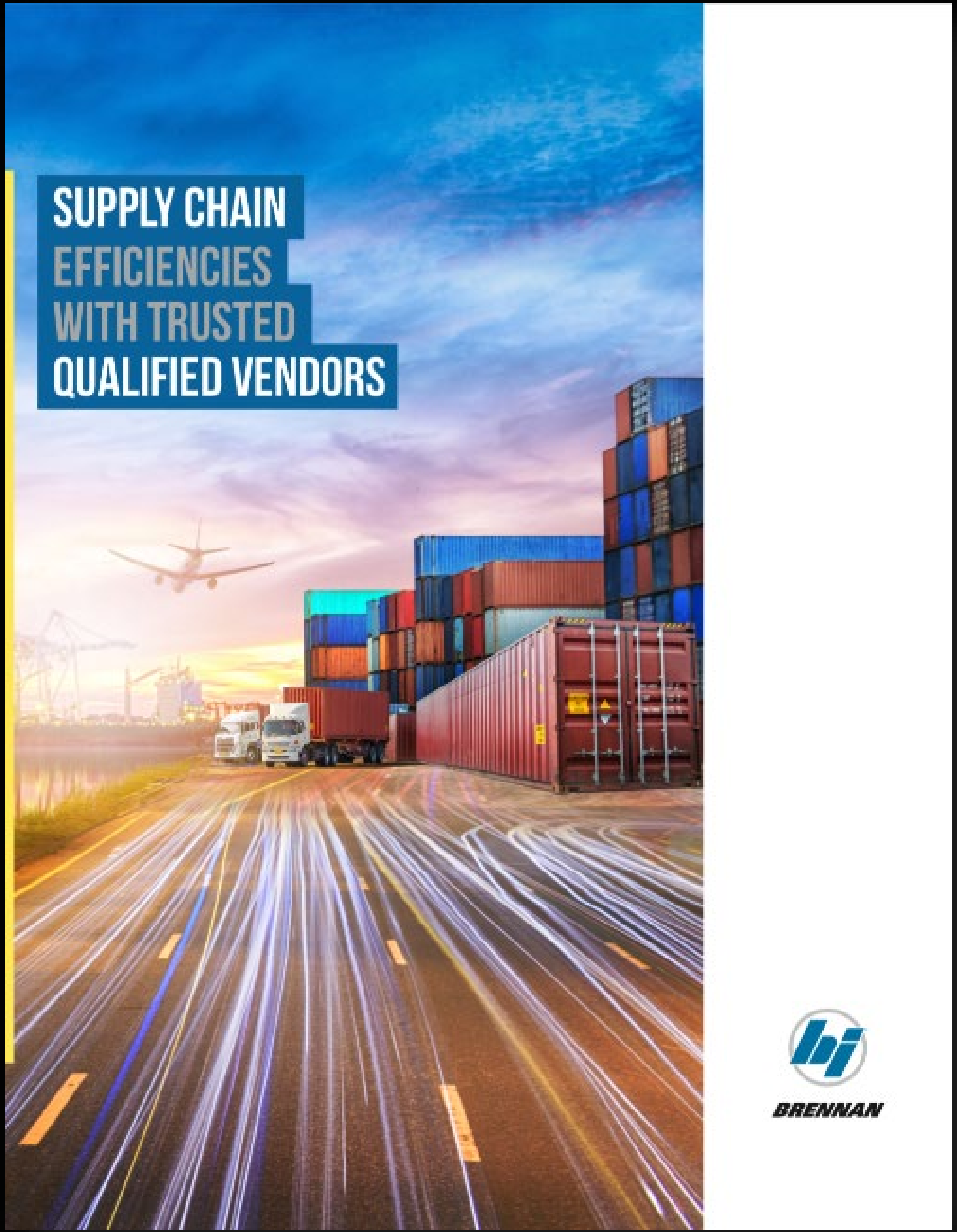
THE MAJOR ADVANTAGES OF FLANGES AND FLANGE FITTINGS
FRAGMENTATION IN CONSTRUCTION EQUIPMENT PARTS PROCUREMENT

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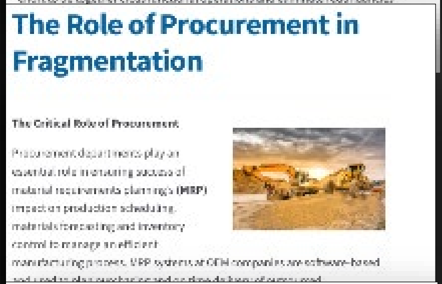
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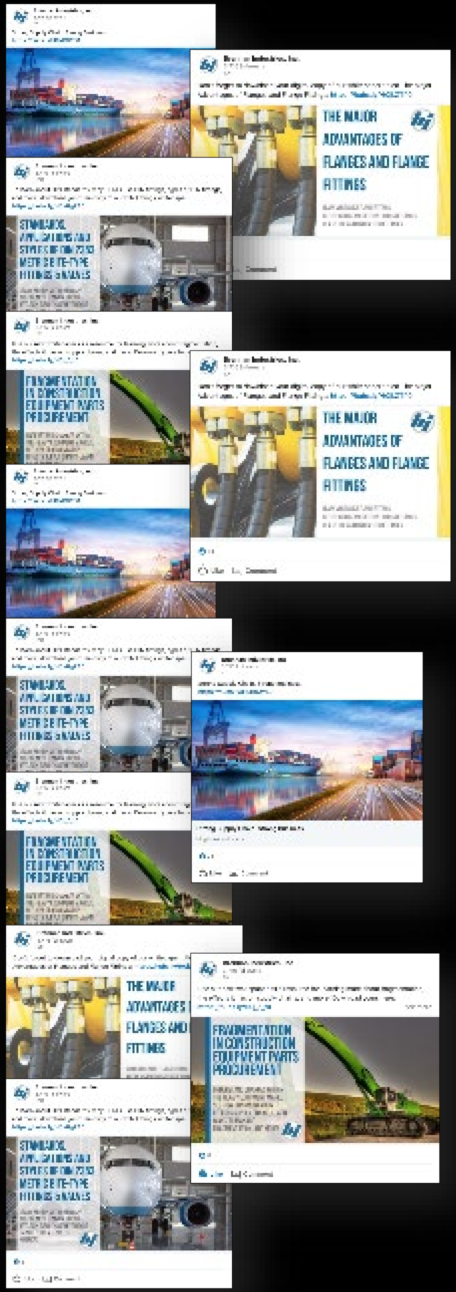

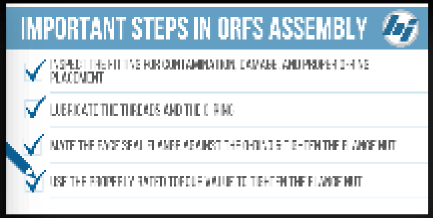

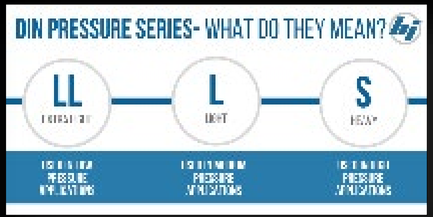

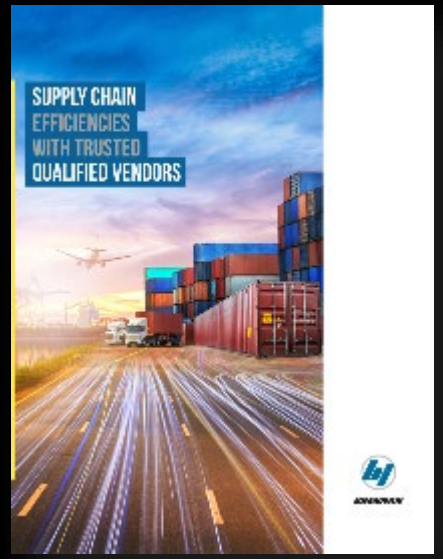
SUPPLY CHAIN
EFFICIENCIES
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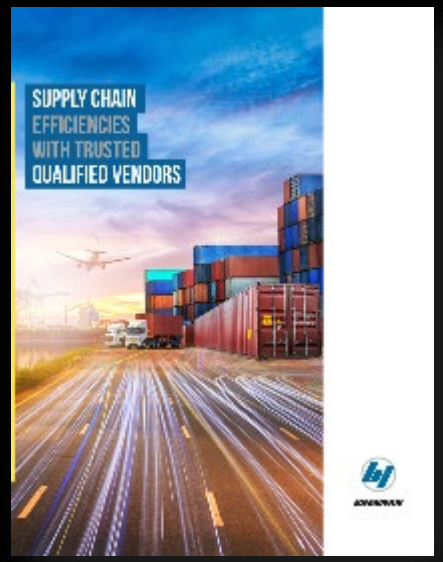
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THE WHAT, WHERE
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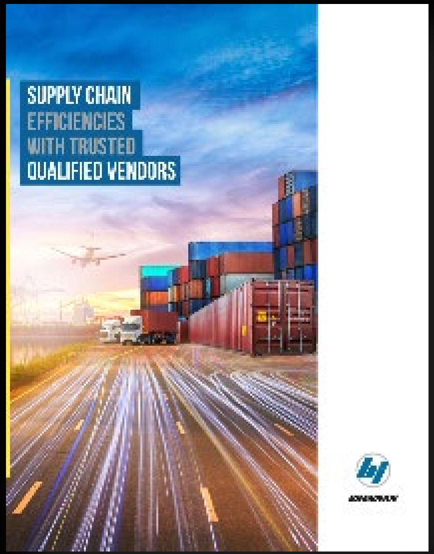
SUPPLY CHAIN
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THE WHAT, WHERE
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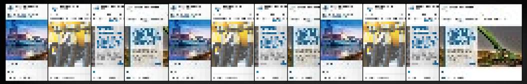
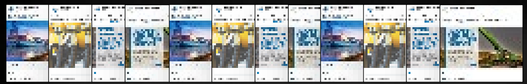
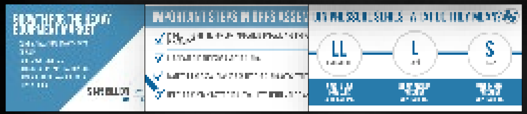
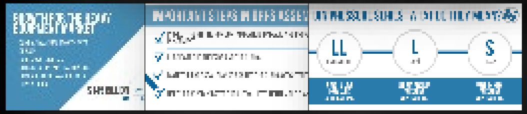
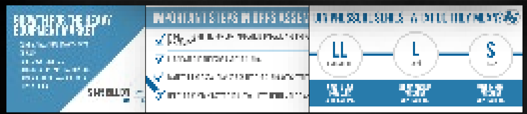
5 THINGS YOU
SHOULD KNOW ABOUT
O-RING FACE
SEAL FITTINGS
(ORFS)









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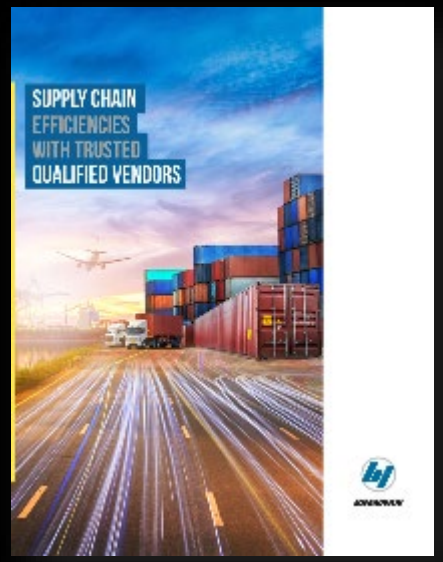
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THE WHAT, WHERE
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5 THINGS YOU
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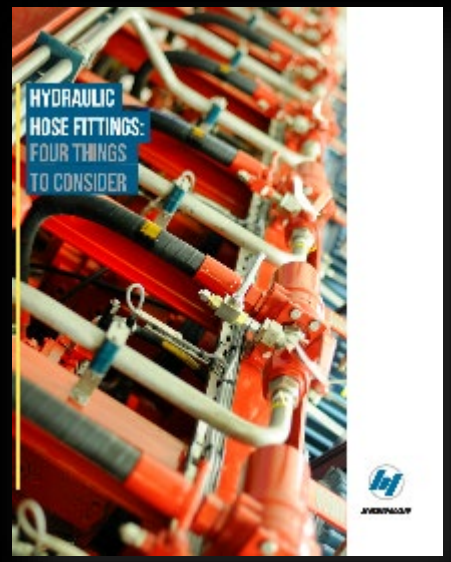
SEAL FITTINGS
(ORFS)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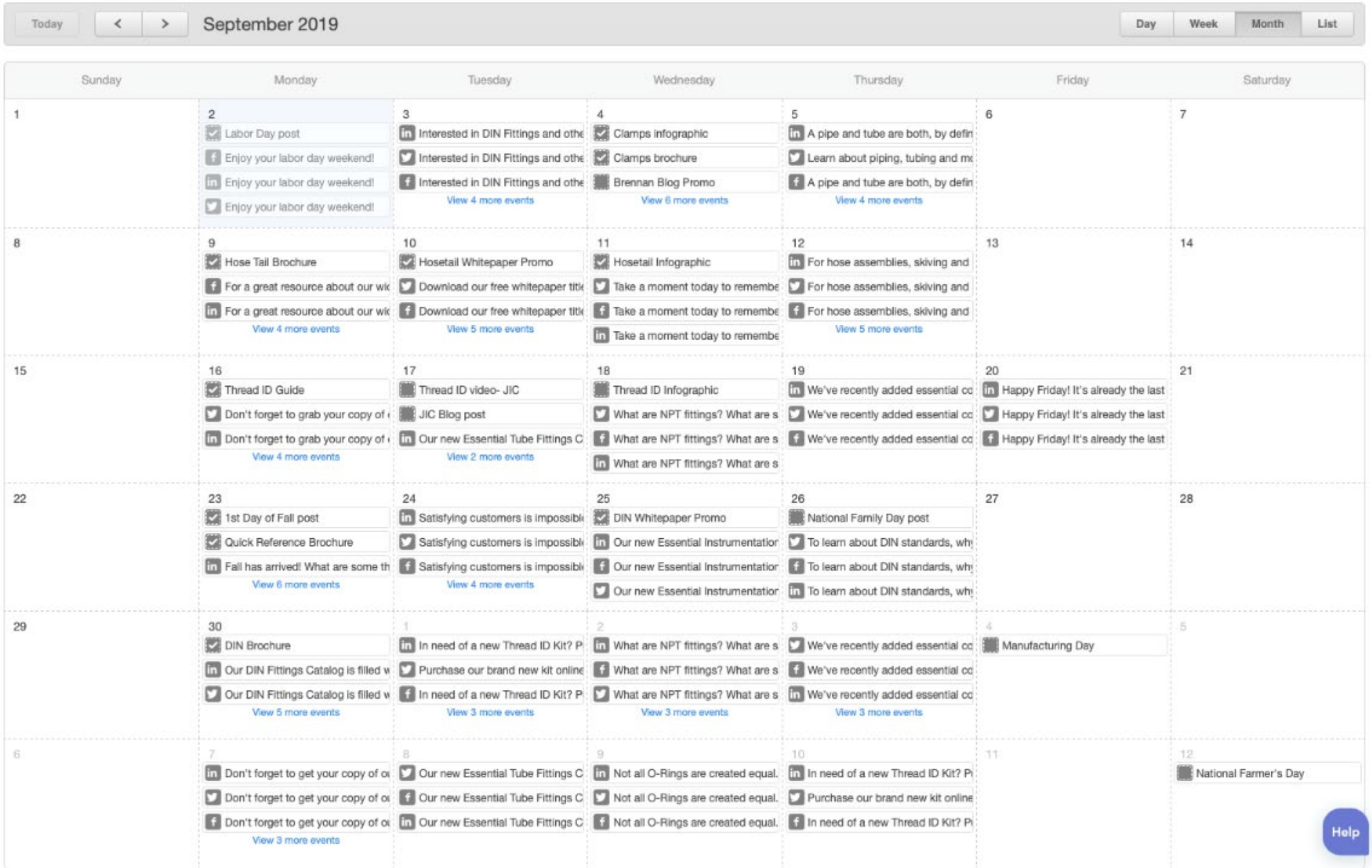
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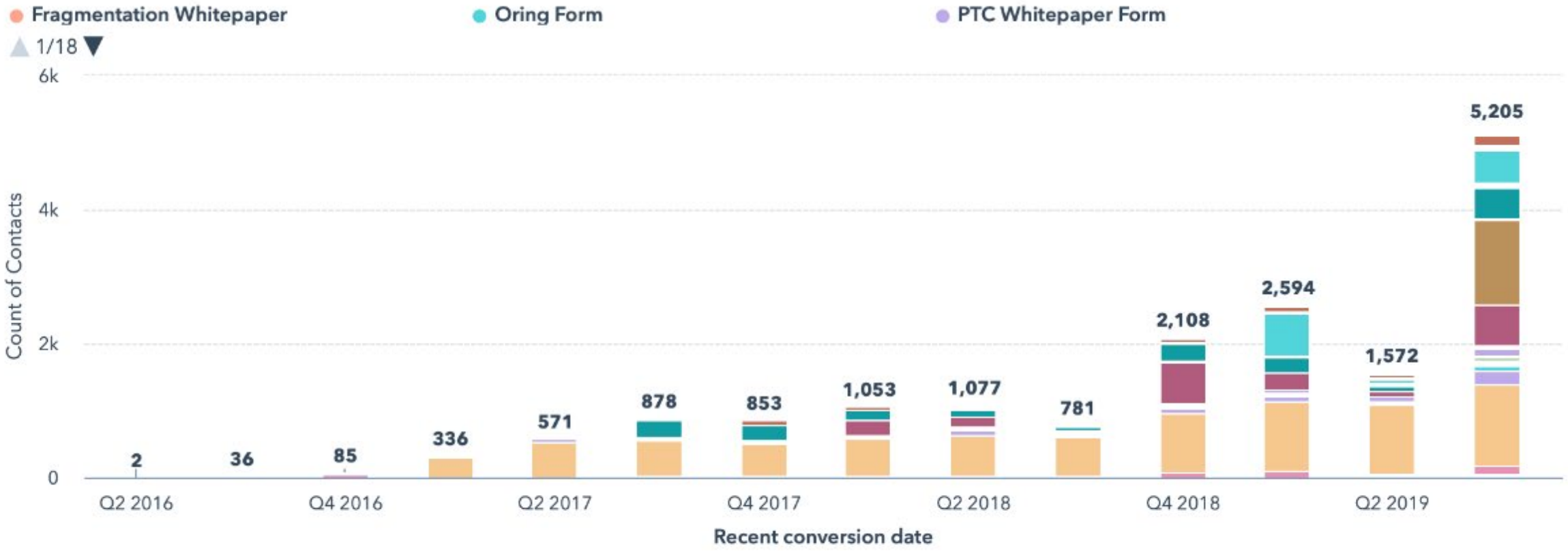


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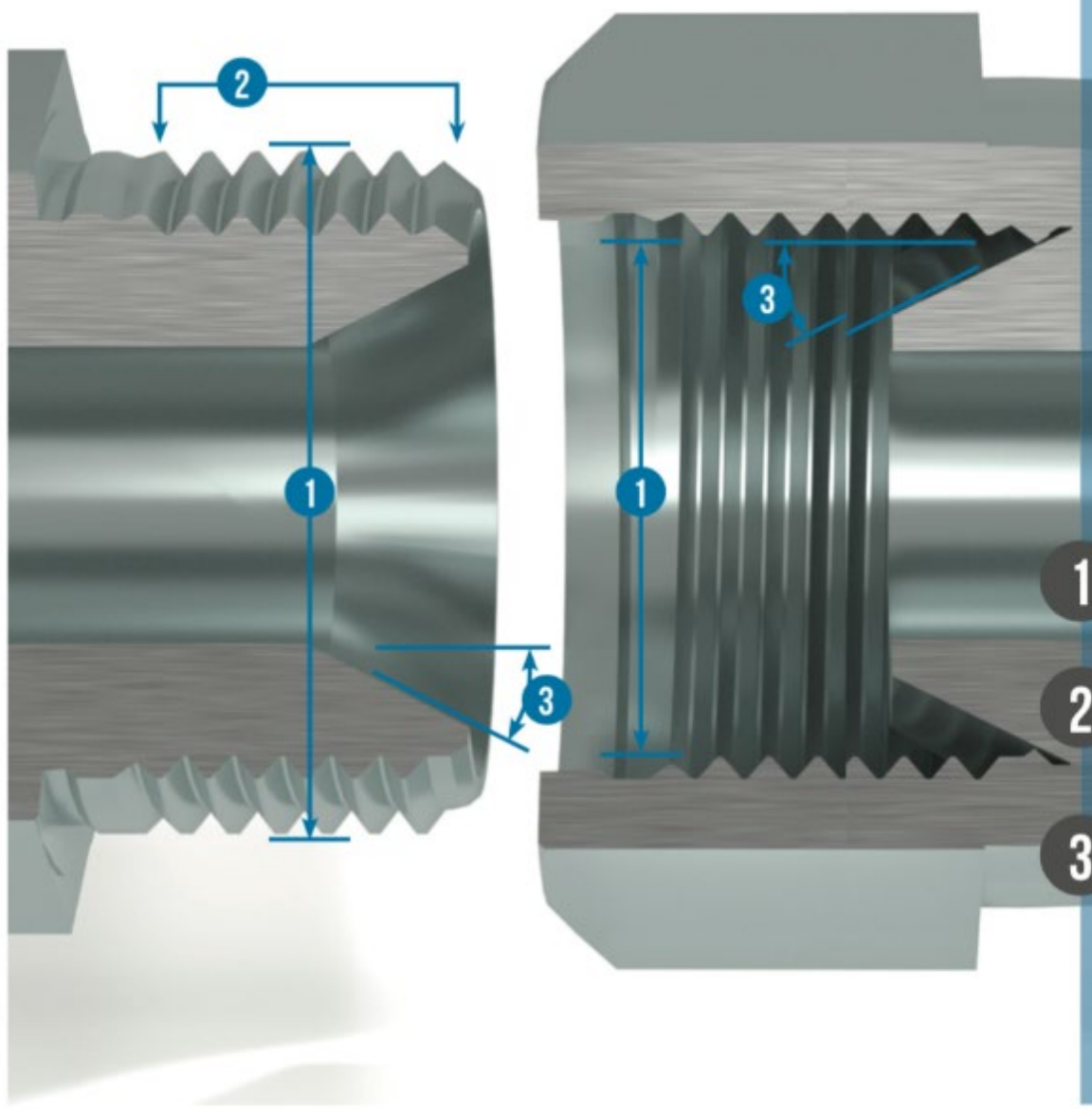
THREAD IDENTIFICATION & MEASUREMENT GUIDE



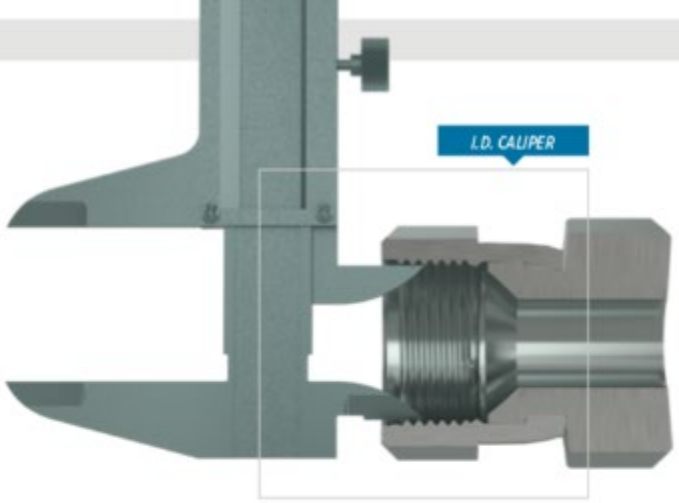
The precise identification of fluid line connectors is critical before selecting and installing the correct fittings. In this guide we will cover some of the most common hydraulic fluid transfer, piping and instrumentation systems and how to measure them in the field.

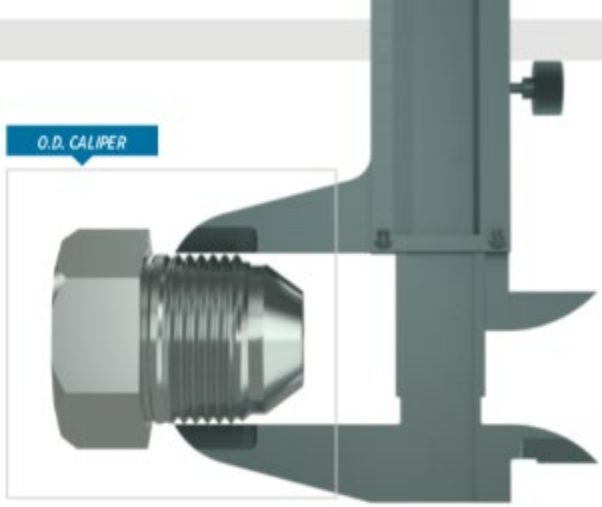
HOW TO MEASURE THREADS

1 **FIRST,** use a combination O.D./I.D. caliper to measure the thread diameter. Note: The threads of a used fitting can become worn and distorted, so the measurements may not be exact.

2 **SECOND,** use a thread pitch gauge to identify the number of threads per inch. For metric connections, measure the distance between threads. Place the gauge on the threads until it fits snugly, match your measurements with the thread chart provided at the back of this guide.

3 **THIRD,** if the port is angled, determine the seat angle by using a gauge on the sealing surface. The centerline of the fitting and the gauge must be parallel.





MEASURING TOOLS

By using a combination of three tools, identifying connectors is easy to do. Using an **I.D./ O.D. CALIPER**, **THREAD PITCH GAUGE** and **SEAT ANGLE GAUGE** allow you to make accurate measurements of most connections. Many thread ID calipers provide both a caliper and a seat angle gauge in one tool.

The **I.D./O.D. CALIPER** is used to measure the O.D. of a male thread and I.D. of a female thread. (Important: When matching gauge measurements to thread charts keep in mind that threads on connections that have been in-service may be worn and distorted from use, causing inexact comparison to the thread tables.

For English, British and other European threads the thread pitch gauge measures the threads per inch. However, for metric threads the gauge will identify the distance between the threads.

The **SEAT ANGLE GAUGE** is used by placing the gauge angle on the sealing surface. The centerline of the fitting end and the gauge should be parallel.

In the English system the thread size and pitch (number of threads per inch) are given, along with the thread type.

MEASURING THREADS

Using the **THREAD PITCH GAUGE**, align the gauge on the threads and make sure it is snug. Match the measurement to the a thread chart. Then measure the thread diameter with the I.D./ O.D. caliper. Match those measurements to the chart. There is a thread chart provided in the back of this guide.

MEASURING SEALING SURFACE ANGLES

FEMALE CONNECTIONS are measured by inserting the ID portion of the gauge into the connection on the sealing surface. Be sure the centerlines of the connection and gauge are parallel to identify the correct angle. For **MALE FLARE TYPE CONNECTIONS**, place the gauge on the sealing surface to establish the measurement. Again, be sure the centerlines of the connection and gauge are parallel to identify the correct angle. See image on the far left for detail.

US AMERICAN CONNECTIONS

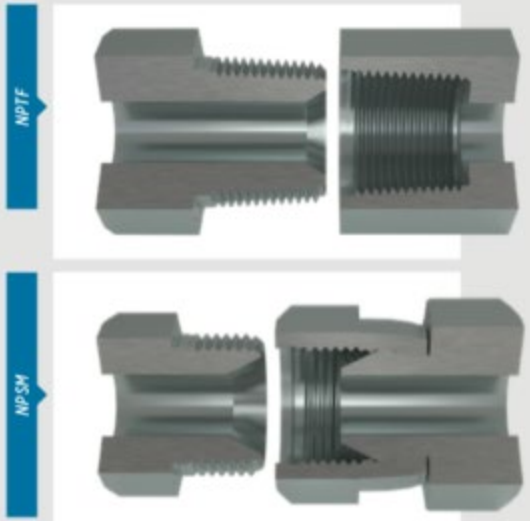
NATIONAL PIPE THREAD (NPT)

NPT (National Pipe Thread) style pipe threads are have been widely used for over 100 years. NPT is a U.S. standard for tapered threads used on pipes and fittings. They are used to effectively seal pipes for fluid and gas transfer. The nominal pipe size can be identified by physically measuring the thread diameter, then subtracting ¼".

They are available in iron or brass for low-pressure applications and carbon steel and stainless steel for high-pressure.

NPTF (National Pipe Tapered Fuel) style connections are widely used in fluid power systems. They have a tapered thread by which a seal is made by deformation of the threads. NPTF Threads are measured at the thread diameter and subtracting ¼ -inch to establish the nominal pipe size.

NPSM (National Pipe Straight Mechanical) connections are also often found in fluid power systems. The female component incorporates a straight thread with an inverted 30° seat. The male component has a straight thread and a 30° internal chamfer. A seal is made by compression of the 30° seat on the chamfer. This is considered a mechanical connection. If an NPTF male is properly chamfered it will also seal with an NPSM female connection.



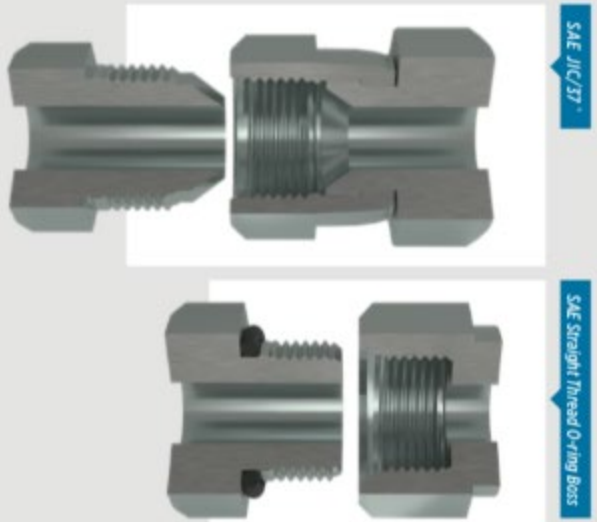
SOCIETY OF AUTOMOTIVE ENGINEERS THREAD (SAE)

SAE J1926 Straight Thread O-ring Boss (ORB) is recommended by the National Fire Protection Association (N.F.P.A.) for leak prevention in medium and high pressure hydraulic systems. The male connection is a straight thread with an O-ring. The female port has a straight thread and a machined surface to provide a smooth, flat, surface (minimum spotface), along with a chamfer where the O-ring seats. It seals when the O-ring is compressed into the chamfer when mating the male connection. This is also considered a mechanical connection.

SAE J514 JIC/37° Hydraulic connections are common in most fluid power systems. Both male and female components have 37° seats. The seal is made by establishing contact between the male flared and the female coned seat. This is also considered a mechanical connection.

SAE J512 45° connections are used in automotive, refrigeration and truck pipe systems. These connectors are typically brass material. The male and female connections have 45° seats, where the seal is made where the male flare and the female cone meet. This is a mechanical connection, also.

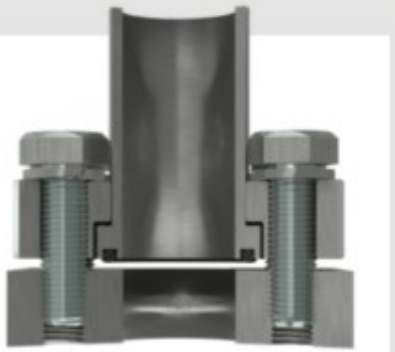
NOTE dash sizes: -02, -03, -04, -05, -08 and -10 of SAE 37° and SAE 45° have the same threads, but NOT the same seat angles. Intermixing the two different types of fittings will result in leakage, so use care in measuring seat angles.



ISO CONNECTIONS

ISO/DIS 6162 4-Bolt Flange* is another common connection found in fluid power systems. There are two pressure ratings for this connection; Code 61: PN 35/350 bar which is considered the standard series Code 62: PN 415 bar which is the high pressure series. They maintain the same design, yet with the bolt hole spacings and flanged head diameters being larger on the PN 415 bar high pressure connection. Inch or metric bolts are found in these connections, however there is an "M" stamped on the port if metric bolts are to be used. The female port of the fitting is a smooth, un-threaded port with four bolt holes set in a rectangular pattern in around the port. The male is a flanged head, with a groove for an O-ring to seat and either split or captive flange halves and bolt holes which match the port. The seal is made where the O-ring is compressed between the flanged head and the flat surface the port. The connection is held by threaded bolts.

ISO 6149 Port and Stud Ends with **ISO** 261 Threads and O-ring Seal though it is similar to the SAE J514 Straight Thread O-ring Boss (ORB), this type connection incorporates metric threads. The male connector has straight threads with an O-ring. The female port is also straight threads machined surface to provide a smooth, flat, accurately located surface (minimum spotface), along with a chamfer where the O-ring seats. It seals when the O-ring is compressed into the chamfer when mating the male connection. This is also considered a mechanical connection.



ISO/DIS 4-Bolt Flange

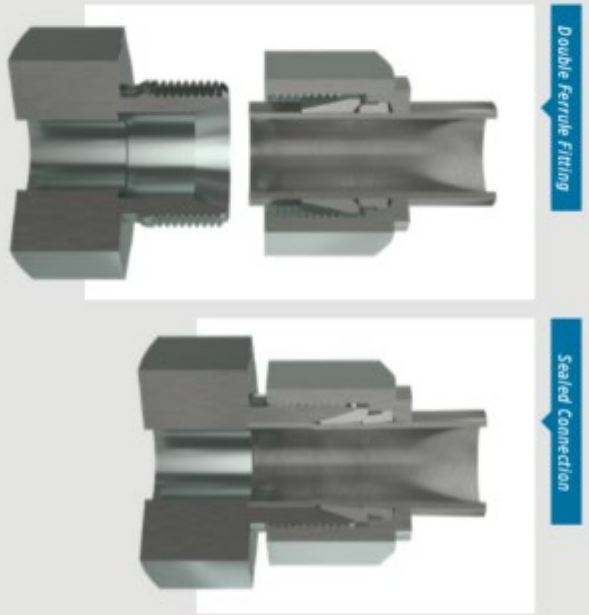
ISO 261 Threads and O-ring Seal

INSTRUMENTATION FITTINGS

Double and Single Ferrule Instrumentation Fittings. Instrumentation fittings are widely used in fluid or gas transfer applications such as refineries, chemical plants and food processing plants. The male end of a double-ferrule instrumentation fitting has a recessed counter-bore which matches the tube O.D. being used, plus an inner cone. The seal is made between the front ferrule and the cone. The tubing is held in place by the swaging action caused by the tightening of the nut, which forces the front and back ferrules to bite into the tubing (see illustration below), firmly holding it in place. This allows for the use of un-flared tubing with these connectors.

The single-ferrule instrumentation fitting is similar, but has a larger front ferrule and no back ferrule. The sealing method is also similar. Both types of instrumentation fittings are commonly available in stainless steel and brass.

Instrumentation fittings have UNEF (extra fine) threads and sizing is determined by the outside diameter of the tubing being used.

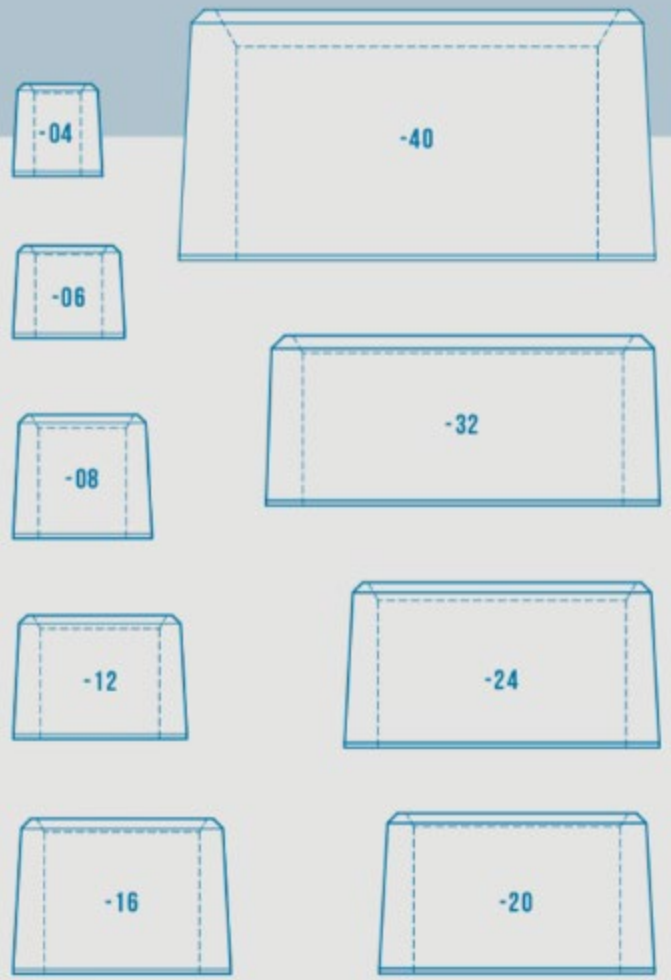


Double Ferrule Fitting

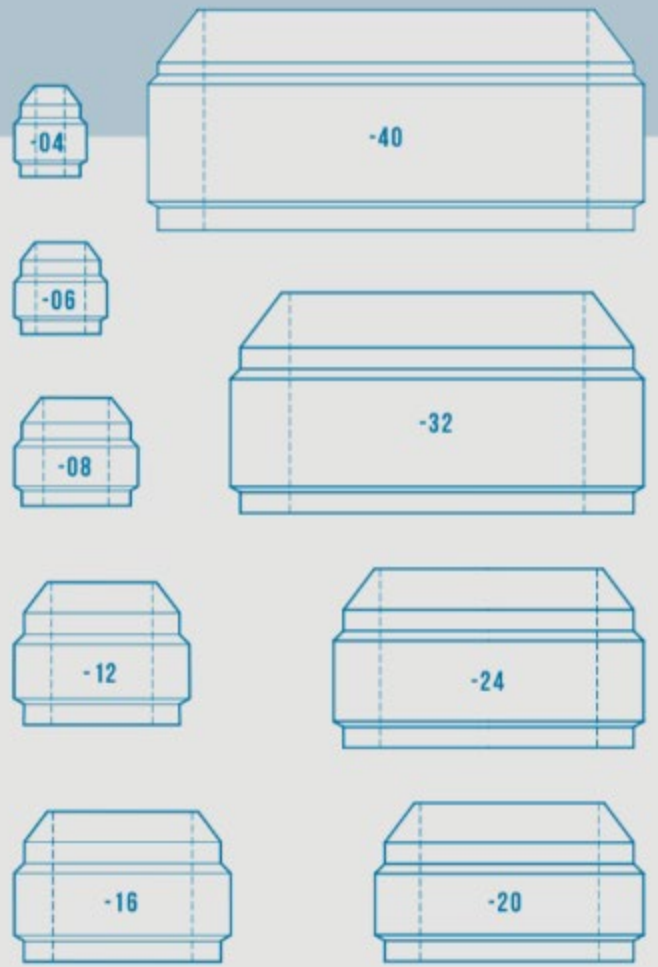
Sealed Connection

VISUAL THREAD GUIDE

MALE PIPE THREAD SIZES



SAE 37° FLARE THREAD SIZES



THREAD DIMENSION TABLE

DASH SIZE	2	3	4	5	6	7	8
TUBE O.D.	1/8	3/16	1/4	5/16	3/8	7/16	1/2
HOSE I.D.	1/8	3/16	1/4	5/16	3/8		1/2
JIC 37-FLARE THREAD	5/16 - 24	3/8 - 24	7/16 - 20	1/2 - 20	9/16 - 18		3/4 - 16
SAE O-RING THREAD	5/16 - 24	3/8 - 24	7/16 - 20	1/2 - 20	9/16 - 18		3/4 - 16
NPTF PIPE THREAD	1/8 - 27		1/4 - 18		3/8 - 18		1/2 - 14
NPSM SWIVEL THREAD	1/8 - 27		1/4 - 18		3/8 - 18		1/2 - 14
FLAT FACE THREAD			9/16 - 18		11/16 - 16		13/16 - 16
CODE 61 FLANGE HEAD O.D.							1.19
CODE 62 FLANGE HEAD O.D.							1.25
BRITISH THREAD BSPP/BSPT	1/8 - 28		1/4 - 19		3/8 - 19		1/2 - 14
BRAKE THREAD			7/16 - 24		17/32 - 24		11/16 - 20
SAE 45-FLARE THREAD	5/16 - 24	3/8 - 24	7/16 - 20	1/2 - 20	5/8 - 18	11/16 - 24	3/4 - 16
INVERTED FLARE THREAD	5/16 - 24	3/8 - 24	7/16 - 24	1/2 - 20	5/8 - 18	11/16 - 18	3/4 - 18
COMPRESSION THREAD	5/16 - 24	3/8 - 24	7/16 - 20	1/2 - 20	9/16 - 18	3/4 - 16	1 - 1-1/2 - 12
METRIC THREAD	10	12	14	16	18	20	22
	M 10X1.0	M 12X1.5	M 14X1.5	M 16X1.5	M 18X1.5	M 20X1.5	M 22X1.5

10	12	14	16	20	24	32	40	48
5/8	3/4	7/8	1	1-1/4	1-1/2	2	2-1/2	3
5/8	3/4		1	1-1/4	1-1/2	2	2-1/2	3
7/8 - 14	1-1/16 - 12	1-3/16 - 12	1-5/16 - 12	1-5/8 - 12	1-7/8 - 12	2-1/2 - 12	3 - 12	3-1/2 - 12
7/8 - 14	1-1/16 - 12	1-3/16 - 12	1-5/16 - 12	1-1/4	1-7/8 - 12	2-1/2 - 12		
	3/4 - 14		1 - 11-1/2	1-1/4	1-1/2 - 11-1/2	2 - 11-1/2	2-1/2 - 8	3 - 8
	3/4 - 14		1 - 11-1/2	1-1/4	1-1/2 - 11-1/2	2 - 11-1/2		
1 - 14	1-3/16 - 12	1-5/16 - 12	1-7/16 - 12	1-1/4	2 - 12			
	1.50		1.75	2.00	2.38	2.81	3.31	4.00
	1.62		1.88	2.12	2.50	3.12		
	3/4 - 14		1 - 11	1-1/4 - 11	1-1/2 - 11			
13/16 - 18	1 - 18							
7/8 - 14	1-1/16 - 14							
7/8 - 18	1-1/16 - 16							
1-5/16 - 12	1-5/16 - 12	1-7/8 - 12	2-1/2-12					
24	26	27	30	33	36	42	48	
M 24X1.5	M 26X1.5	M 27X2.0	M 30X2.0	M 33X2.0	M 36X2.0	M 42X2.0	M 48X2.0	

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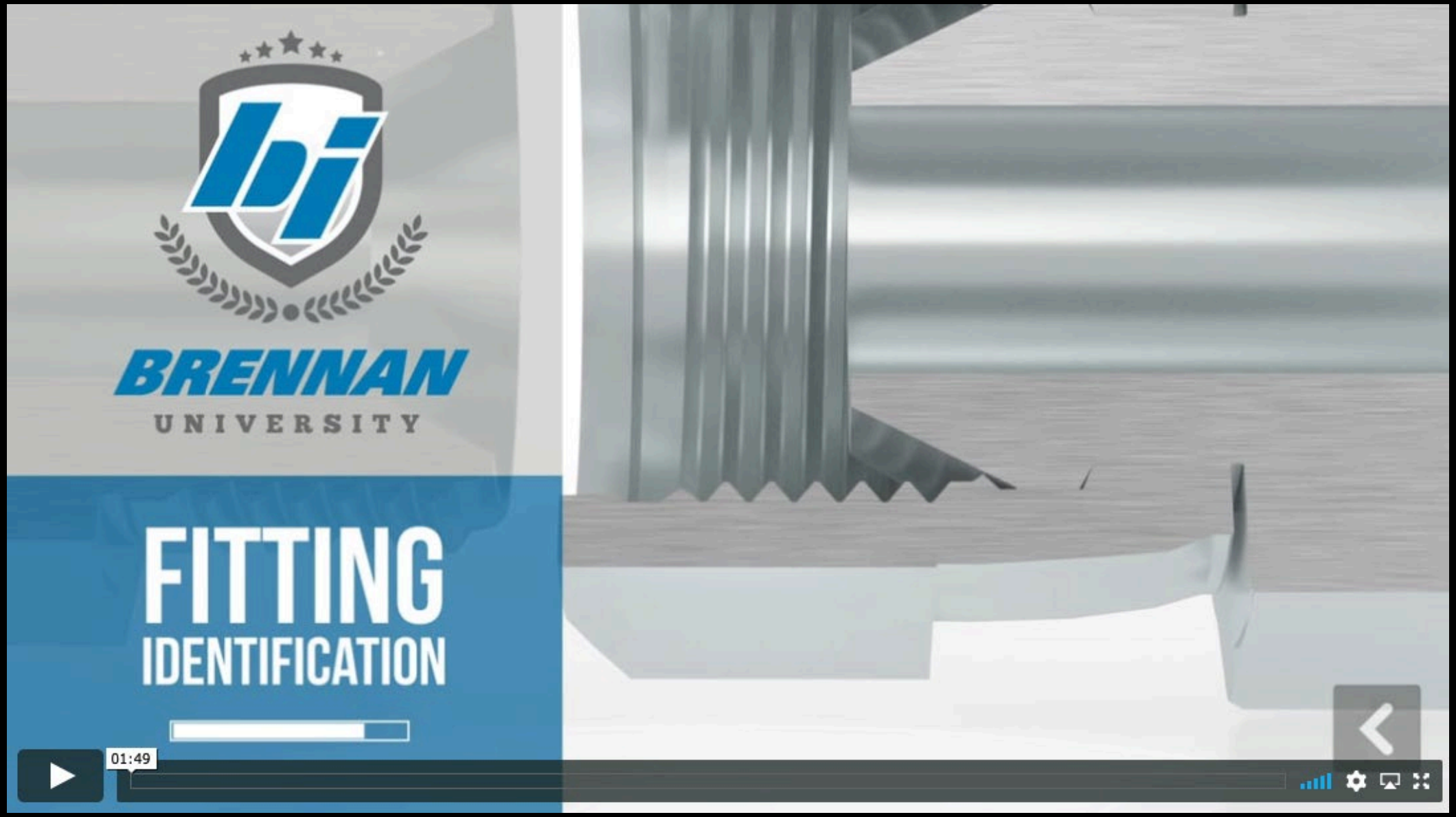
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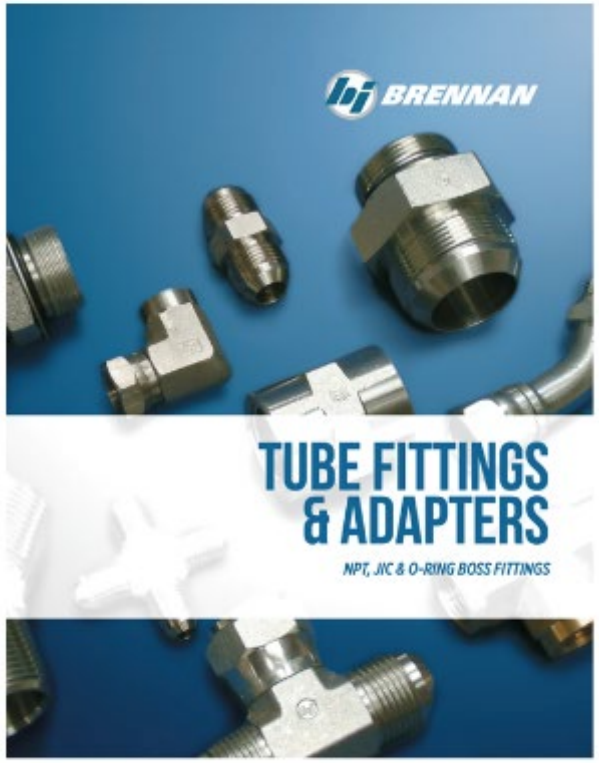

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