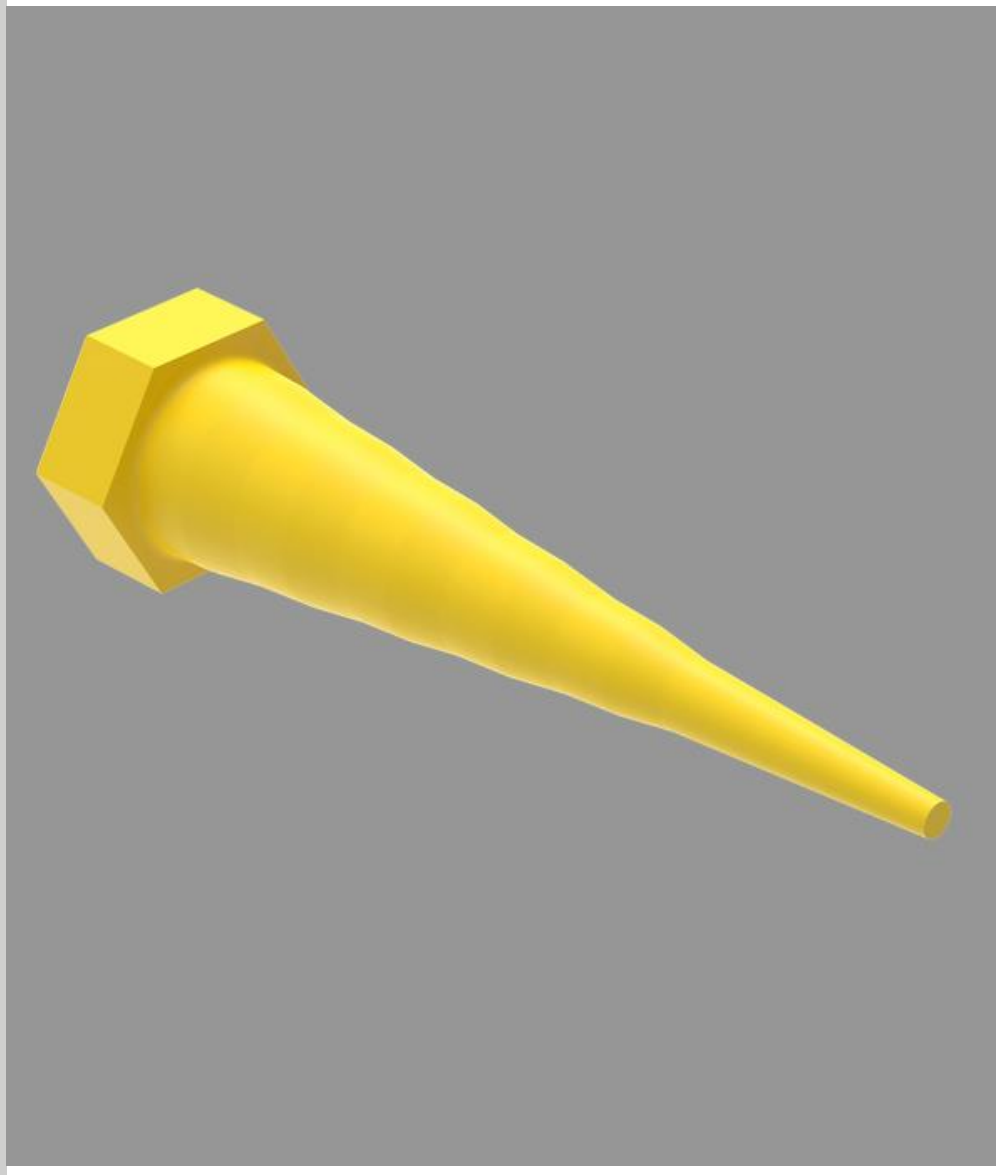


John D. Gill

Introduction to Service Plugs

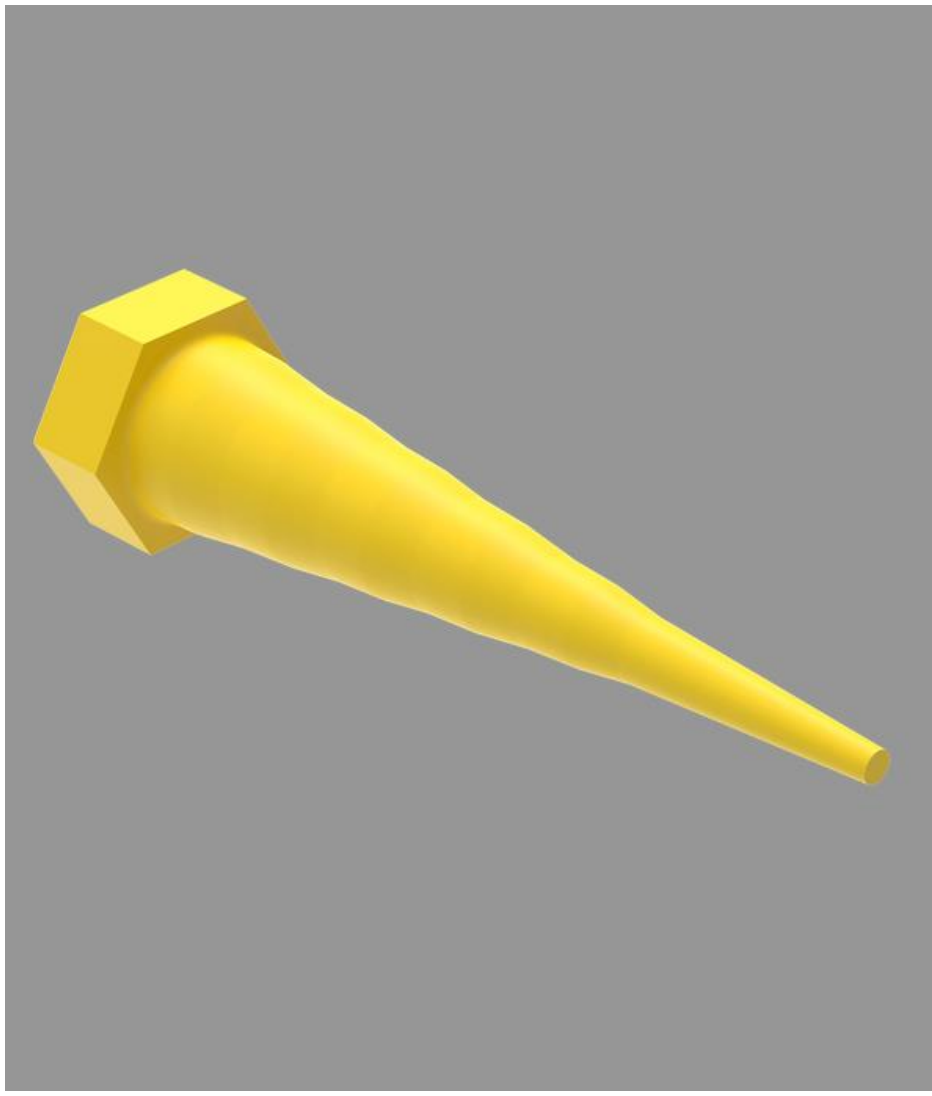
caplugs

Contents

Overview

Plugs designed to seal pipes or holes

- Tapered to fit multiple hole sizes
- Available in packs and individually
- Oil and chemical resistant material
- Reusable multiple times
- Manufactured by Caplugs in an ISO 9001 and IATF 16949 certified plant.



Service plugs have been designed to keep residual fluids in pipes and components. They are also designed to keep foreign objects (FOD) out.

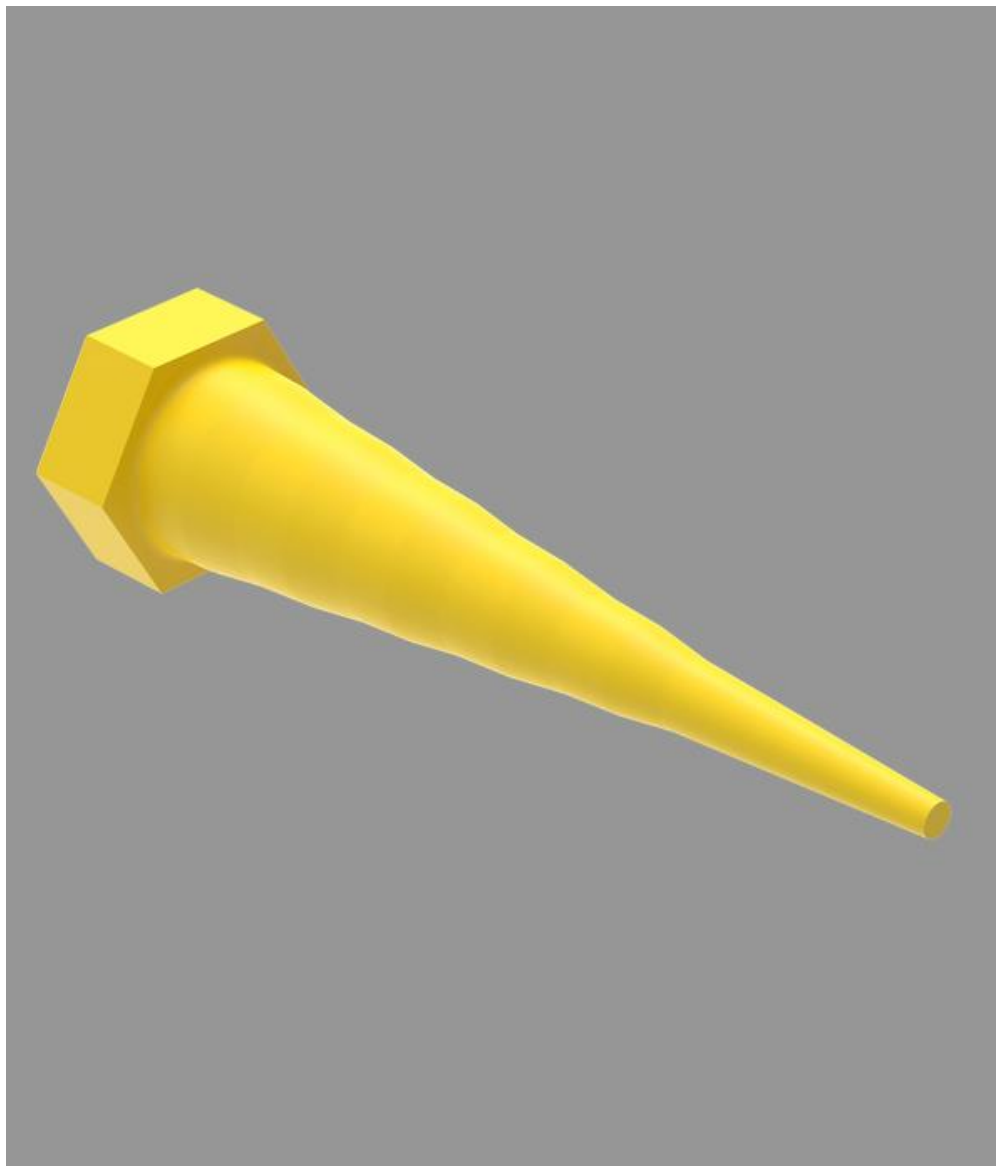
The plugs fit in the ends of the pipe and prevent residual liquid or chemicals coming out of the pipe. They can also be used to prevent prewash fluid and paint from entering pipes or holes.

The plugs are both flexible and tapered to ensure a tight fit in the hole.

The plugs are supplied in packs with a selection of plugs in the pack.

The plugs are manufactured in a yellow material, but we can manufacture them in other colors and materials.

The large end of the plug is designed so that the plug can be twisted into position. This means no tools are required to install or remove the plugs.



Application

Where the plugs fit

The picture on the right is a typical application for the service plugs. In this case, the plug is being used to seal a hydraulic hose during the maintenance operation.

As they are a large tapered plug, the plugs can be used in other applications and industries such as:

- Aircraft MRO
- Hydraulic repairs
- Sanitary and plumbing systems and pipes
- Heating and air conditioning systems
- Automotive
- Boats, motorcycles, off road vehicles
- Oil industry
- Private household
- Demolition
- Spray painting
- Swimming pools
- Wherever you need a tapered plug to seal a hole

Processes

Processes these plugs can be used in

- General maintenance - The plugs can be used to stop residual liquid or chemicals coming out of the item under maintenance.
- General protection - Because they fit multiple diameters they can be used for general product protection. For example during transportation.
- Surface treatment - The plugs can be used to plug holes, pipes and bores during the surface treatment process.

Material

Service Plugs Material Properties

A general guide to the definition and properties of the Service Plugs material.

Overview:
Our Service Plugs are made from NBR. Also known as Nitrile the material is a good material to use where oil, gas and chemical resistance is required.

Advantages:
Resistant to oil, fuel and chemicals, Nitrile has a high tensile strength and good compression set resistance.

Key: A = Excellent B = Very Good C = Good D = Fair E = Poor

Definition	
ISO / DIN 1629 Abbreviation	NBR
ASTM D2000 / SAE J2000	BF, BG, BK, CH
ASTM D 1418	NBR
MIL-STD-417	SB
Other Names	Buna-N
Trade names	Nipol
Chemical name	Acrylonitrile Butadiene polymer
Example Caplugs series made from this material	FP-SH Series
Surface Treatment processes using this material	Plating, Wet painting

Typical physical, mechanical and thermal properties	
Typical Hardness (Shore A)	50
Hardness Range (Shore A)	30 - 100
Specific Gravity of the base polymer (g/cc)	1
Modulus at 100% strain (psi)	490 - 550
Tensile strength ($x10^3$ psi)	1.0 - 4
Elongation	300 - 650
Colors	Yellow as standard
Abrasion resistance	C - A
Compression set	C - A
Flex cracking resistance	C
Impact resistance	D - C
Rebound resilience	C
Tear resistance	C - A
Volume Resistivity (Ohm - cm)	$3.5x10^{10}$
Maximum temperature (°F)	250
Minimum temperature (°F)	-40

Typical environmental and chemical resistance	
Gas Permeability	D - C
Oxidation Resistance	C
Ozone Resistance	E - D
Radiation Resistance	D - C
Shelf Life in years (cool, dry, no radiation)	2 - 5
Steam Resistance	D - C
Weather Resistance	E - D
Water Resistance	C - A
Acids, concentrated	D - C
Acids, dilute	C
Acids inorganic	D - C
Acids, organic	E - C
Alcohols	D - C
Animal and vegetable oils	C - A
Brake fluids, Non Gasoline Based	E
Esters	E
Ethers	E
Halogenated solvents	E
Hydrocarbon, halogenated	E - D
Ketones	E
Lacquer solvents	D
L.P. Gases and Fuel oils	A
Mineral oil	A
Petroleum, aromatic	C
Petroleum, non-aromatic	A
Refrigerant Ammonia	C
Refrigerant Haloflurocarbons	R11, 12, 13
Refrigerant Haloflurocarbons w/oil	R11, 12

Key: A = Excellent B = Very Good C = Good D = Fair E = Poor

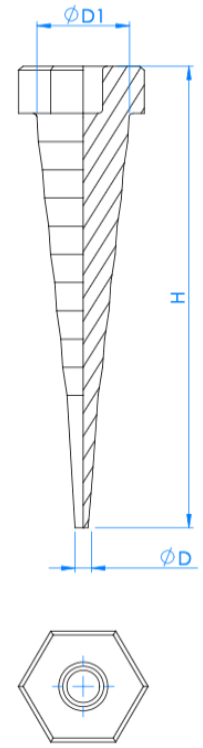
This data represents typical properties, no warranty expressed or implied. Samples of material are available and recommended to test in your application.

For more information see our website caplugs.com

Dimensions & Packaging

The service plugs are available in packs or as individual plugs. The contents of each pack and option are shown below.

Packs are clear with a Caplugs label on the outside. Packs can be labelled with a customer's label.



Part Number	Description	Size Range (in)	Size Range (mm)	Quantity Per Pack	Color
PTSP-MIX	Mixed Pack - 4 Micro | 4 Std | 2 XL	04 - 1.70	1 - 43	10	Yellow
PTSP-MICRO	Micro	.04 - .40	1 - 10	20	Yellow
PTSP-ST	Standard	.16 - .91	4 - 23	10	Yellow
PTSP-XL	XL	.47 - 1.70	12 - 43	4	Yellow
PTIND-SM	Small - Single Plug	1.40 - 3.10	36 - 79	1	Yellow
PTIND-XL	XL - Single Plug	2.40 - 5.10	61 - 130	1	Yellow
PTSP-MICRO-BAG	Micro	.04 - .40	1 - 10	50	Yellow
PTSP-ST-BAG	Standard	.16 - .91	4 - 23	100	Yellow
PTSP-XL-BAG	XL	.47 - 1.70	12 - 43	100	Yellow