

# AI-01651 Angle Valve NPT vs NPSM

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## Explain a 2-way valve F3/8-18NPSM,

A 2-way valve with a F3/8-18 NPSM connection refers to a two-port valve (one inlet, one outlet) designed to start or stop the flow of a fluid (like water, air, or oil) in a system. Let's break down each part:

### 1. 2-Way Valve:

- Has two ports: an inlet and an outlet.
- Function: Either opens to allow flow or closes to block it.
- Common in on/off control applications.

### 2. F3/8-18 NPSM:

- F: Female (internal threads).
- 3/8-18: Size and thread pitch:
  - 3/8 inch nominal pipe size
  - 18 threads per inch (TPI)
- NPSM: National Pipe Straight Mechanical:
  - A straight (non-tapered) pipe thread.
  - Often used with a sealing washer or O-ring, not thread sealant.

## Use Case Example:

You might use a 2-way valve with F3/8-18 NPSM threads in a pneumatic or hydraulic line where you want to manually or automatically turn the fluid flow on or

off, and the connections are made with straight-threaded male fittings and sealing washers.

Would you like a diagram to illustrate this type of valve and connection?

### **18NPSM is not similar to the standard 3/8 ??**

Great question — and you're right to notice the subtle but important distinction.

### **Is 3/8-18 NPSM the same as standard 3/8?**

No — not exactly.

Let's break it down:

#### **1. "Standard 3/8" — What does that usually mean?**

People often mean 3/8" NPT (National Pipe Tapered) when they say "standard 3/8" in plumbing or pneumatics.

- 3/8" NPT:
  - Tapered thread.
  - Seals by thread wedging (metal-to-metal contact with thread sealant like PTFE tape).
  - Common in high-pressure applications.
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#### **2. 3/8-18 NPSM — What is it then?**

- NPSM = National Pipe Straight Mechanical
- Threads are parallel/straight, not tapered.
- Needs a gasket, O-ring, or washer to seal — not the threads themselves.
- Still uses 3/8" nominal pipe size and 18 threads per inch — same TPI as 3/8" NPT, but again: not tapered.

#### **Why this matters:**

- A 3/8" NPT male can thread into a 3/8" NPSM female, but won't seal properly unless designed to do so (e.g. with a sealing washer or O-ring).
- Thread compatibility is not the same as seal compatibility.

**Summary:**

<b>Spec</b>	<b>Type</b>	<b>Threads</b>	<b>Sealing Method</b>
3/8" NPT	Tapered	18 TPI	Thread sealant (tapered fit)
3/8-18 NPSM	Straight	18 TPI	O-ring, washer, or gasket

Would you like examples of applications where NPSM is preferred over NPT?