34-03 *Solution*

Lathe Tooling

➲ Answers to questions (based on Kennametal® tools, but very similar for other manufacturers):

1. The relief angle of a DNMG insert is 0° - the letter ***N*** means a neutral angle, neither positive nor negative
2. No, the letter ***A*** in TNMA means there is no chipbreaker built into the insert
3. The most common inserts for turning are 80°, 55°, 35° and sometimes 60° or even 90°.
   They are often called 'diamond' tools, not because of their material composition but their polygonal shape
4. The first letter of the insert designation is its shape: C = 80°, D = 55°, V = 35°, T = 60°, S = 90°
5. The letter ***W*** means a trigon insert, with three cutting edges. The letter ***G*** means the insert is double sided,
   therefore there are 6 cutting edges on this insert
6. Yes, a CNMG-432 insert can be used in left hand or right hand tool holders, external or internal.
   The reason is that the shape of this insert is not matched to the toolholder orientation
7. The last letter indicates the qualified back and end of the toolholder:
   C means the toolholder is 5 inches long, ***D*** means the toolholder is 6 inches long
8. In the ANSI insert identification VNMG-432, the digit ***4*** indicates 4/8 or ½ inscribed circle size (∅0.5).
   In the toolholder identification, MVJNL-164D, the digit ***4*** indicates 4/8 or ½ inscribed circle size (∅0.5).
   As both sizes are identical, the insert is compatible with the toolholder
9. The thickness of the insert is identified by the second of the three digits - in SNMG-643,
   the digit ***4*** means 4/16 insert thickness, which is 0.250
10. In the DDPNN-164D, the second letter ***D*** indicates a ***D*** insert shape, which is 55°. Insert first letter must be ***D***.
    The first letter ***N*** indicates the toolholder accepts an insert with 0° clearance angle. Insert second letter must be ***N***.
    The digit ***4*** indicates the insert size for this toolholder is ∅0.5 inscribed circle. Insert first number must be ***4***.
    For the specified tool, the insert accepted can be DNMG-432 (DNMG-432) - note the highlighted features
11. ***Tool A*** is a ***left-hand*** tool, ***Tool B*** is a ***right-hand*** tool
12. Boring bar identified as ***Tool A*** is a ***left-hand*** tool, boring bar identified as ***Tool B*** is a ***right-hand*** tool.
13. ***Tool A*** is an 80° diamond tool, using an insert starting with the letter ***C***
    Tool B is a 35° diamond tool, using an insert starting with the letter ***V***
    Tool C is a 55° diamond tool, using an insert starting with the letter ***D***
14. The ***second*** letter in a toolholder designation identifies the ***insert shape***, the ***third*** letter identifies
    the tool ***lead angle***, and the ***fifth*** letter identifies the toolholder ***orientation***

    All three tools shown tools are neither right hand nor left hand, which means they have a neutral orientation,
    identified by the letter ***N*** in the fifth position.

    The letter in the second position will be ***S*** for the 90° tool, ***D*** for the 55° tool, and ***V*** for the 35° tool.

    The correct answers are (top to bottom): DSDNN-164D DDPNN-164D DVVNN-164D

    The third letter in the toolholder designation is the lead angle: D = 45° P = 27.5° V = 17.5°

15. A toolholder identified as MDJNR-163D has the following characteristics:

15-a The letter ***M*** identifies the clamping type as ***pin top and hole clamping***

15-b The first letter ***D*** identifies the insert shape as ***D***, which is a ***55° diamond tool shape***

15-c The letter ***J*** identifies the tool ***lead angle***, 3° for this particular tool

15-d The letter ***N*** identifies the insert ***clearance angle***, ***N*** means 0° (negative insert)

15-e The letter ***R*** identifies the ***hand of tool*** as right-hand

15-f For square shanks greater than 5/8, these two digits have to be taken as ***a pair***, not individually:
15-g The two digits ***16*** identify the ***square shank*** as 16/16 = 1.00 inch square shank

15-h The digit ***3*** identifies the ***inscribed circle diameter of an insert*** that the toolholder accepts (in 1/8ths):
3 = 3/8 = ∅0.375 inscribed circle

15-I The last letter ***D*** identifies a ***qualified back and end***, 6 inches long toolholder

16. An insert with the last three digits of 543 (ANSI designation), has the following characteristics:

16-a The digit ***5*** identifies the size of the insert ***inscribed circle*** in 1/8ths - 5/8 = 0.625

16-b The digit ***4*** identifies the insert ***thickness*** in 1/16ths - 4/16 = 0.250

16-c The digit ***3*** identifies the insert ***radius*** in 1/64ths - 3/64 = 0.0469

17. An ISO insert with the designation VBMT 11 03 08 has the following characteristics:

17-a The letter ***V*** is the shape of the insert - 35° included angle

17-b The letter ***B*** identifies the tool as having a 5° relief angle

17-c The letter ***M*** identifies the tolerances - check tooling catalogue for details

17-d The letter ***T*** identifies the insert as single sided with a hole and a built-in chipbreaker

17-e The pair of digits ***11*** identifies the insert ***edge length*** as 11 mm

17-f The pair of digits ***03*** identifies the insert ***thickness*** as 3 mm (actual thickness is 3.18 mm)

17-g The pair of digits ***08*** identifies the insert ***radius*** as 0.8 mm

18. An ANSI insert with the designation CNMG-432 (one of the most common inserts) has the following characteristics:

18-a The letter ***C*** is the shape of the insert - 80° included angle

18-b The letter ***N*** identifies the tool as having a 0° relief angle

18-c The letter ***M*** identifies the tolerances - check tooling catalogue for details

18-d The letter ***G*** identifies the insert as double sided with a hole and a built-in chipbreaker

18-e The digit ***4*** identifies the size of the insert ***inscribed circle*** in 1/8ths - 4/8 = 0.500

18-f The digit ***3*** identifies the insert ***thickness*** in 1/16ths - 3/16 = 0.1875

18-g The digit ***2*** identifies the insert ***radius*** in 1/64ths - 2/64 = 0.0313