NEW STANDARD FOR METRIC TAPER THREADS

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Several types of general-purposes taper thread are being used in our industry, namely:
taper thread for pipes made according to the All-Union State Standards (GOST) 6211-69;
inch taper thread made according to GOST 6111-52;
inch taper thread for sealed junctions made according to GOST 12717-67;
metric taper thread M6 x 1 made according to GOST 19853-74;
external taper and internal cylindrical metric threads for combined cylinroconical
junctions (Volga Automobile Plant standard).

Analysis shows that:
all the taper threads are used in practice for one and the same purpose of providing
sealed junctions;
special pressurized packing is used almost invariably with the inch taper threads for
obtaining sealed junctions;
the inch taper thread with a 60° profile angle made according to GOST 6111-52 is the most
widely used of all the taper thread types;
inch threads have several deficiencies both of a structural and technological nature,
for instance, they lack the possibility of obtaining a more economical type of threaded junc-
tions employing an external taper and an internal cylindrical thread, because the taper
thread has a profile of 60° and the cylindrical one of 55°; in many instances it is impossible
to use the highly efficient method of thread rolling owing to the small flat on the crest
of threads;
the utilization in our country of several types of taper threads impedes the use of pur-
chased and component products with coupling threads of other types, thus making it necessary
to resort to "adaptors" from one thread to another;
all the threads have similar parameters, and have no advantages from the design point
of view;

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TABLE 1

<table>
<thead>
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<th>Nominal diameters of threads, mm</th>
<th>1st series</th>
<th>2nd series</th>
<th>Thread pitch, mm</th>
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</table>

Fig. 3

it is economically disadvantageous to have five equally-valuable but not interchangeable threads.

It follows from the above that it is advisable to unify them and adopt two types of threads:

the taper pipe thread made according to GOST 6211-69 and used in all the industrially-developed countries; especially since it is covered by the Comecon standard ST8-72 and the ISO recommendation R7;

a metric taper thread which would provide for two junction types: a taper junction (external and internal taper threads) and a cylindroconical junction (external taper and internal cylindrical threads).

The metric taper thread is free from the deficiencies of the inch taper thread, whereas the cylindroconical threaded junctions are considerably superior to the inch threaded junctions with respect to their economic and utilization indexes, as indicated by the Volga Automobile Plant.

The new Comecon standard ST304-76 on "Metric taper thread" covers the general-purposes metric taper thread which has a taper of 1:16 and is used for taper threaded junctions, as well as for junctions with taper external and cylindrical internal threads and their nominal profile made according to the Comecon standard ST180-75.

Thread Profile. The taper thread profile (Fig. 1) was based on a nominal thread profile specified by the Comecon standard ST180-75 and corresponding to the metric-thread profile made according to GOST 9150-69. This was made for the purpose of unifying thread profiles, the possibility of joining not only two taper threads (external and internal) (Fig. 2), but also a taper external with a cylindrical internal thread (Fig. 3), and for unifying thread cutting and measuring tools intended for internal cylindrical threads.

The particular features of the external and internal thread profiles consist of the plane-cut roots of threads and the absence of clearances, for the purpose of providing sealed junctions. The standard does not specify the root shape if there are no requirements for tightness or if packing is used for obtaining sealed thread junctions.

Thread nomenclature which was adopted in the standard covers 21 standard sizes with diameters of 6 to 60 mm and a pitch of 1 to 2 mm (see Table 1).

The Comecon standard ST181-75 on "Metric thread. Diameters and pitches" specifies three series of diameters. For the purpose of unification our standard for the taper metric thread establishes only two series of diameters. The first series should be used preferentially.

The suggested thread nomenclature was established bearing in mind the maximum possible reduction in standard thread sizes of GOST 8724-68 on "Metric thread for diameters of 1 to 600 mm. Diameters and pitches," Comecon standard ST181-75, Fiat-VAZ norms, and foreign standards.